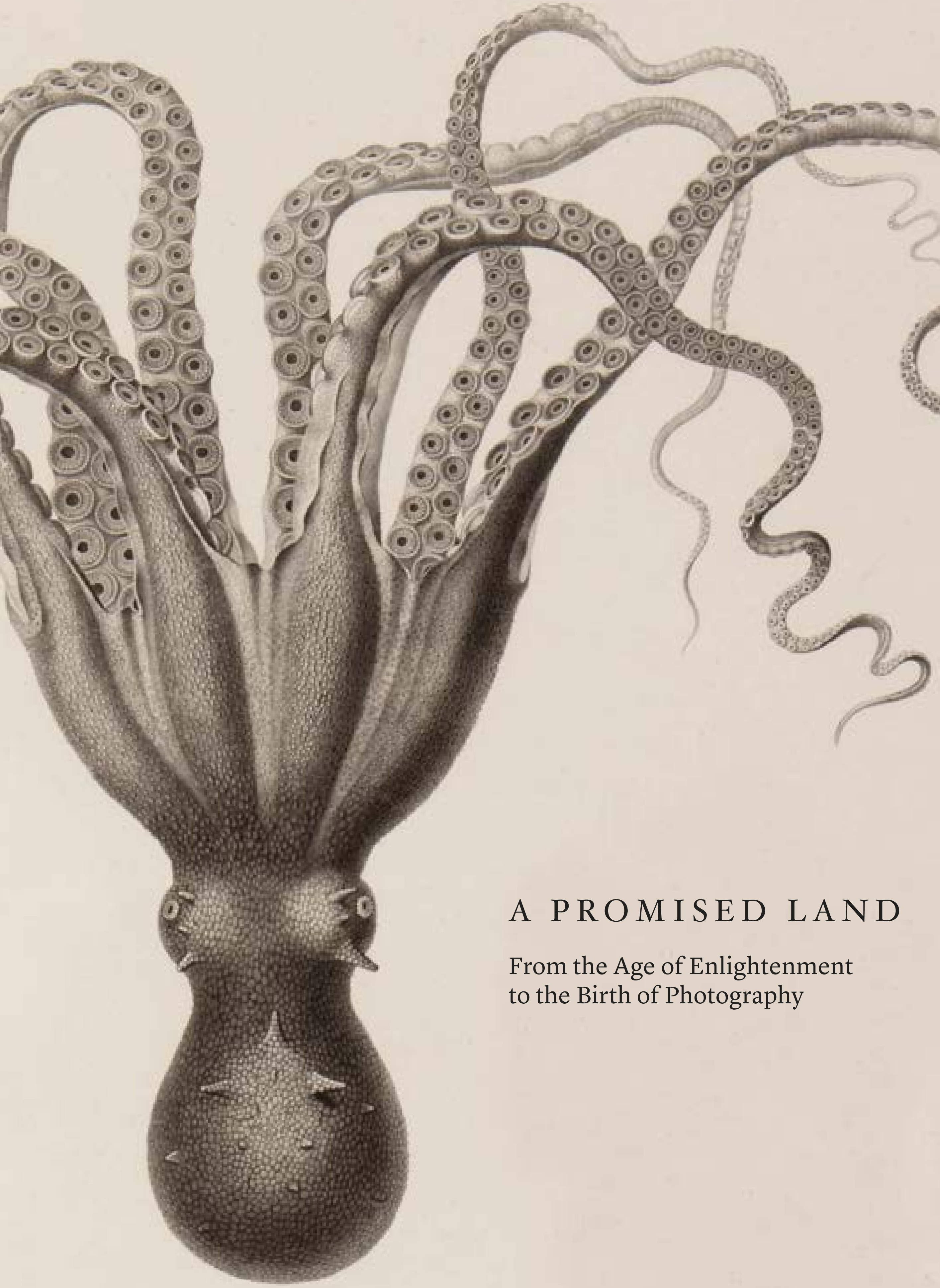
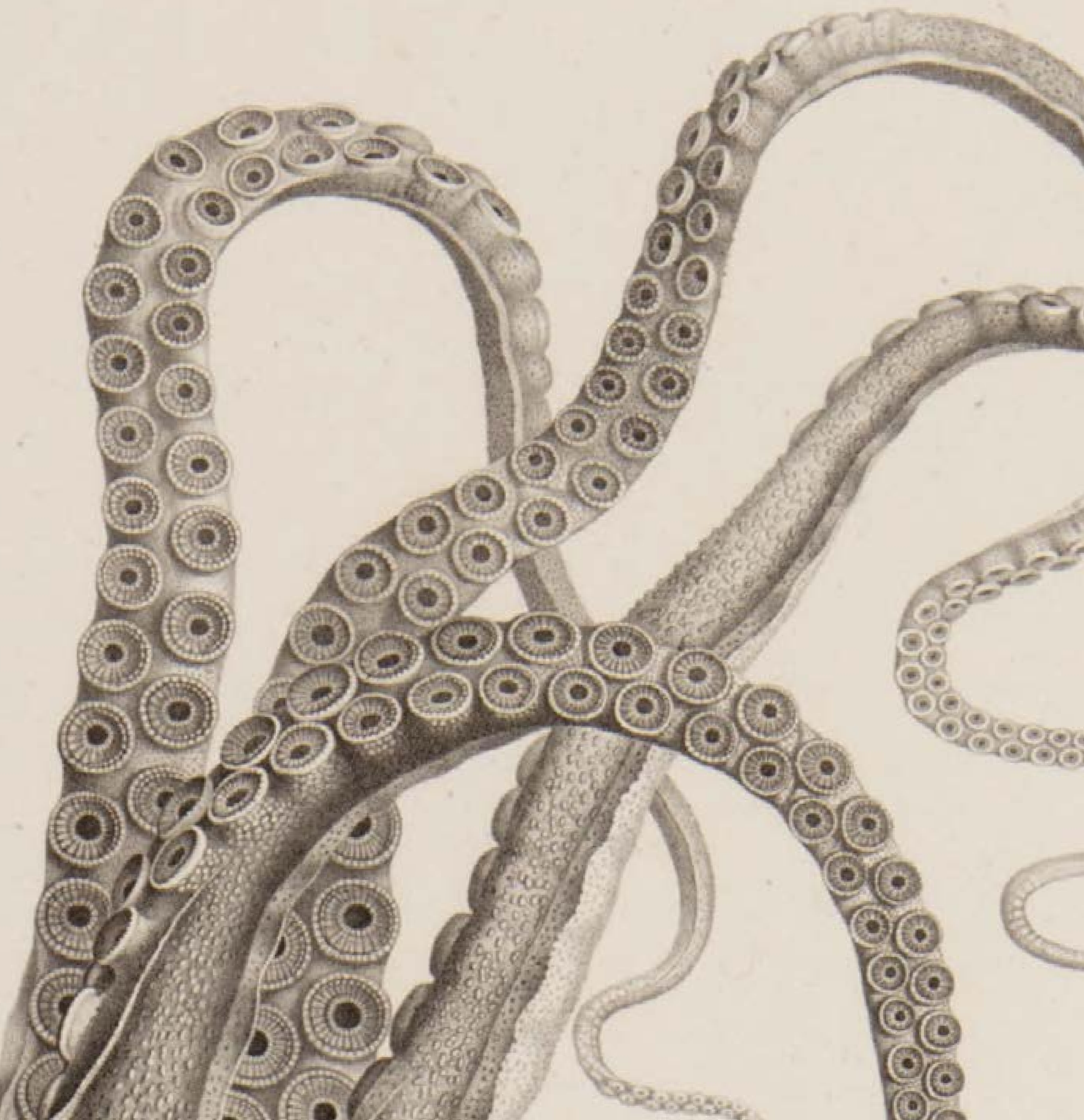


A PROMISED LAND

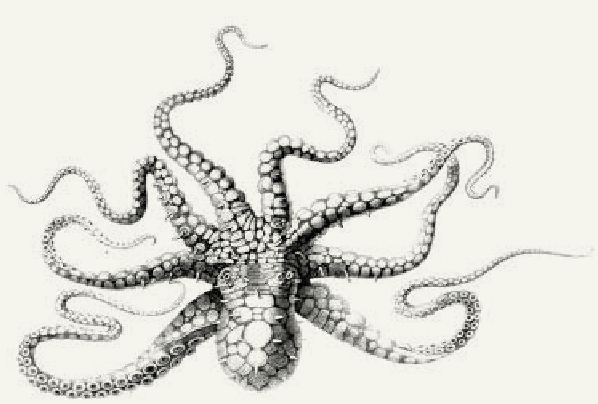
From the Age of Enlightenment
to the Birth of Photography



A PROMISED LAND

From the Age of Enlightenment
to the Birth of Photography

Museo Universidad de Navarra



FROM THE AGE OF ENLIGHTENMENT TO THE BIRTH OF PHOTOGRAPHY

Rafael Levenfeld & **Valentín Vallhonrat**

Two events underpin the origin of this exhibition. We owe the first one to the French academic François Arago, astronomer and Permanent Secretary of the Paris Academy of Sciences, when he presented on 19 August 1839 the invention of the daguerreotype by Louis Mandé Daguerre and Nicéphore Niépce. The second is none other than the investigation conducted by Rafael Levenfeld in compiling iconographic repertoires that preceded photography, repertoires that he gathered together under the ambitious and suggestive title of *Iconográfica*. His research located several hundreds of albums that gather, abridge and arrange the set of scientific illustrations describing birds, flowers, plants, mammals, vertebrates, invertebrates, marine wildlife, human anatomy, the architecture of the past… the list continues but I cease to enumerate the subject matters they featured because he held that in the 17th and 18th centuries a huge effort had been made to collect in images not only what was already known but also each one of the species, objects, trees, crustaceans, worms, fruits, butterflies, gems and, ultimately, the entirety of existence, while also compiling what would gradually be discovered in the scientific expeditions launched under the auspices of the Spanish Crown between 1730 and 1800 and which was later continued by the expeditions sponsored by mainly the French, English and Dutch monarchies. This is essentially the compilation of universal knowledge in albums through which it was sought to devise a multiple image, one that was deemed to be a complete one of reality.

Initially Levenfeld focused his attention on the scientific expeditions and voyages commissioned by the Spanish Crown during the 18th century, especially the Franco-Spanish expedition to the Viceroyalty of Peru (1777) headed by Joseph Dombey, Hipólito Ruiz and José Antonio Pavón; the travels to New Spain of Martín de Sessé (1787); the expedition of Alejandro Malaspina and José Bustamante (1789-1798) from Alaska to Cape Horn (1794); the expedition of J. Longinos Martínez (1792), but, above all, the expeditions of Alexander von Humboldt, who with the authorisation of the Spanish king Charles IV embarked on his travels in South America with the help of Spanish scientists who joined the expeditions to New Granada and New Spain. Rafael especially highlighted Humboldt's encounters with José Celestino Mutis, his collections of illustrations of flowers and plants and the annotations on the botanical expedition to the New Kingdom of Granada, which provided essential information that would enrich the studies of the German scientist on the flora and wildlife in the territories of Hispanic America.

Humboldt would be the connecting link with Napoleon's expedition to Egypt. The German scientist chose to obtain Charles IV's permission to go to America when he was up against repeated refusals to be allowed to join Napoleon's expedition to Egypt. This is how we arrive at the albums.

The albums that constitute *The Description of Egypt* showed us similarities between the photographs taken by the pioneers of photography in the Middle East and Egypt and the engravings that illustrated the encyclopaedia published under the aegis of Napoleon. Arago's comment, which you can read later in these pages, was premonitory. Sixteen years after the publication of the encyclopaedia's last volume, in December of the same year of the presentation Arago gave on photography, the first daguerreotypists arrived in Egypt. Their images were collected as engravings by Lerebours in his 1844 publication *Excursions Daguerriennes*. For his travels in Egypt the calotypist

Celestino Mutis, Mutisia clematis. Salvador Rizo. Real Expedición Botánica del Nuevo Reino de Granada de Celestino Mutis (1783-1808).

Maxime Du Camp used the pages of Napoleon's expedition to document and outline the itineraries he would later follow and to choose some of the places, buildings and monuments he would later photograph. This is part of the background that underscored the need to launch this project.

The felicitous meeting which the undersigned enjoyed with the wise Nicaraguan collector Dr. Ernesto Fernández Holmann made it possible for this exhibition and expansion of the University of Navarra Museum's collection to happen. In that encounter the doctor showed us the albums from his collection that corresponded to the scientific expeditions in America of La Perouse, of Humboldt, of Captain Dupaix and myriad other bibliographic jewels that included the expedition of Captain James Cook, Audubon's Birds of America and others you will discover in the description of the albums included in the texts by Professor Ignacio Miguéliz, who is responsible for this museum's collection. When we asked the doctor whether he might also have some of the albums of Napoleon's expedition to Egypt, he answered that he did not have some, he had all of them. The complete *La Description de l'Égypte*. But that to study and review it we would have to travel to Guatemala. In brief, the generosity and commitment to the arts and sciences of Don Ernesto made it possible for the twenty-three volumes that comprise the imperial edition of *La Description* to form part of the MUN's collection.

What follows is the approximation to what we thought was the main core in which the relationship between photography and scientific illustration is inscribed; the reasons why this connection would lead to major changes in the arts of that time, which affected and currently still affect the arts, modern at the time and contemporary today.

This is a topic halfway between science, art and thought. Observed from the present day, the massive consequences which the invention of photography has had for our civilisation are undeniable. It has affected the culture of the image, the culture of information, its dissemination, the putting in motion of images and their universalisation, the creation of the entertainment culture, cinematography and television, politics; it has brought about a revolution in the arts since it was presented in the 19th century. It has permeated every layer of our existence and has led to images becoming the universal language through which we communicate. And they are images that stem from photography: photochemical, analogue, digital, documentary records, images derived from invention, from conceptual activity, from mathematics, from science, from human intelligence and from the applications and drifts of the mind. Including the misnamed artificial intelligence.

Our culture, then, would be incomprehensible without analysing the responsibility which photographic tools, photographic discipline, the photographic phenomenon, have.

For around thirty years we have been organising a photography collection that would allow us to show that to which we are referring. The history of photography is being permanently rewritten. It is too recent. The phenomenon is so multifaceted that it requires a multidisciplinary approach and is not the exclusive task of an art centre or of an ordinary museum. But this is a museum in and belonging to a university. So research is one of our remits. It is a somewhat special and unique museum.

Initially we built a collection from the bottom up, from the origin of the photographic phenomenon in Spain when there was no other collection that would serve as a reference. We have generated influences for everyone else who has followed our lead; laid the foundations to know the reach of the phenomenon in constructing the idea and image of Spain. We have accepted the idea of photography as a constructed image.

That a photograph is a construction that fabulates on a reality that is changeable and photography is a tool that allows us to set in images our desires for permanence and transcendence. The collection later focused on a wider territorial scope that ties the photography developed in Spain with the photography developed in Latin America and in the Near East and North Africa.

The photographic medium has also been approached through an attempt to understand its significance and symbology, the emotions it stirs up, the emotions it transmits. Photography has been approached while taking heed of iconography, theorising on its capacity to be reproduced, as if that were its nature. We have sought to find significance, associate it with movements that provide context and intentionality. We have sought to find meaning. To understand the phenomenon.

For many decades photography has been described in a manner extraneous to the rest of artistic disciplines. And yet, applying methodologies and themes, we have theorised according to the genres we have applied to the study of the history of painting.

Recent studies point to the use made by the great masters from the 16th to the 19th century and their dependency on optical advances that led to the photographic camera or photographic projectors. Today we know that painters such as Vermeer, Canaletto, Rembrandt, Caravaggio, etc.... and more recent ones, Sorolla, Darío Villalba, David Hockney, Andy Warhol and so many others, would be unthinkable without the development of the camera lucida and the camera obscura, or without the subsequent refinements of photography.

This exhibition does not seek to explain everything, but it does aim to show the tradition from which photography is derived and how it certifies the end of an era and the start of another one in the progression of the visual arts.

The abrupt end of the Palace arts, i.e. commissions from monarchs, the aristocracy and the clergy, is closely related to the French Revolution and the execution of Louis XVI and his wife Marie Antoinette of France.

Before that extraordinary event, the vast majority of artists placidly served the interests of the powers that be and their need to construct narratives, symbolic images, using languages and systems of interposed meanings to serve the needs of their patrons.

Painting dealt with biblical scenes, lives of saints, lives of mythological gods and heroes. Events through which to narrate history or build history. Life narrated through beauty and symbology, the so-called interposed stories.

After the Revolution that ended the lives of the French monarchs on the guillotine, this art entered a delicate stage.

Gustave de Beaucorps, Séville. Plaza Mayor, albumen paper,1858.
Claudius Galen Wheelhouse, Plaza della Constituzione. Sevilla, salted paper, 1849.

Major artists such as David, Gericault, Ingres or Delacroix were unwilling to abandon these ways of dealing with reality and so continued to paint with grandiloquence and mastery about events, working on the necessary narratives that extolled the figure of the emperor Napoleon Bonaparte, the construction of the image of the new civil power or the exaltation of a new mythology associated with the Revolution or the Republic.

The origin of modernity in art is attributed to contentious events and the Academy's rejection of the Academy behind the fate of the painters of Realism, especially the great Courbet and three of his paintings: *A Burial at Ornans* from 1850, *The Painter's Studio* from 1855 and *L'Origine du monde* from 1866. These paintings have become a reference in describing the birth of Modern Art.

Audience in front of the works of Gustave Courbet at the Musée d'Orsay. © Rafael Levenfeld, 2021.

And just like when we talk of Courbet as a reference for the new relationship of art and reality, we could say that the first photographs by Niépce from 1823, preceding Courbet's *L'Origine du monde* by thirty years, the daguerreotypes from 1834 onwards and the calotypes presented in 1841 have in another way become a reference to point to the incorporation of reality as the principal theme of art and the trigger for Modern art. Two decades before Courbet an image of a 20x25-cm silver-plated plaque allowed viewers to observe enlargements under a magnifying glass of up to 48 times its size in unprecedented detail and precision without the contours of the image breaking up and without losing definition in the details.

This project is crucial for the Collection and the programming of our Museum. As well as explaining the origin and development of the Spanish and Latin American collection, it connects photographs from the 19th, 20th and 21st centuries with the scientific and descriptive iconography of the 18th century.

The thesis of the exhibition seeks to make visible the artistic and conceptual tradition from which photography arises. It thus refers to the 18th-century scientists, painters, draughtsmen and engravers, who developed a profound capacity for observation and analysis of their environment, together with the production and organisation of images that represent it according to the parameters and needs set by science: exactness, precision, veracity, credibility, equivalence and detail, among others. Through thousands of drawings and engraved plates, a reality was announced that ensured the veracity of the represented objects. This is why these images, for the making of which they had often resorted to the help of optical instruments such as the camera obscura or the camera lucida to facilitate copying, are considered proto-photographs, the precursors that would facilitate the emergence and acceptance of the 19th-century phenomenon of photography.

The title *A Promised Land* refers to the promises of emancipation and freedom proposed by the Age of Enlightenment, which aspired to the banishing of ignorance through the development and establishment of empirical science. It also refers to the path followed by photography in biblical territories and ultimately to the ties with a journey that has its start in the Near East and ends in the Spanish cities of Seville, Granada and Córdoba, places defined for European photographers as the Eastern South. For the photographers at the end of their Egyptian travels in Alexandria, where they embarked for Gibraltar, or those who came from northern Europe and entered Spain via Irún (see From Paris to Cádiz. Calotype and Collodion), our particular promised land.

To structure the exhibition we have defined three areas that explain the route followed, with the objective representation of the world through drawing and engraving. A first section displays the albums and illustrations referring to natural sciences and voyages and a second one is devoted entirely to the Imperial edition of *The Description of Egypt*, whose complete title is *Description de l'Égypte, ou Recueil des observations et des recherches qui ont été faites en Égypte pendant l'expédition de l'armée française*. The third area features the birth of photography and its development and journey around the Mediterranean.

The 18th century in Europe experienced extraordinary cultural advances, mainly in Great Britain and France, although it quickly extended to Germany and Western Europe. Since the Modern Age, man had been interested in the knowledge of the world and of the other. During this century, as we already pointed out, knowledge of the world was going to be captured in a scientific manner through plates, in an attempt to expand the horizon of culture. Throughout the seventeen-hundreds, multiple expeditions voyaged to the five

Louis Le Clercq, Séville. La Tour de l'Or, albumen paper, 1859-1860. / Alphonse De Launay, Alhambra Panel, salted paper, 1853.

continents and captured the written and iconographic narration of other peoples in order to present it to the eyes of European man who, for the first time, discovered in an accurate manner everything that surrounded him, not only what were understood to be exotic worlds such as America, Africa, Asia and Oceania but also Europe itself.

It was in this century, which was born under the spirit of the Enlightenment and ended with the American, French and industrial revolutions, when we witnessed the birth of numerous disciplines that gave shape to almost the entirety of the art-system as we know it today. In this century we saw the enshrinement of art criticism. Etienne La Font de Saint-Yenne, considered the founder of art criticism, in his book *Reflections on some causes of the present state of painting in France*, which dates from 1746, was one of the first ones to postulate a decadence in art that turned towards gallantry, frivolity and lightness, what he denominates small, or French, taste, which is none other than Rococo art. La Font's work unleashed a veritable abundance of critical writings. Art criticism forms part of the general movement of literary, philosophical or political mid-century thinking.

And a prominent member of this thinking is Denis Diderot. This author, who is also the father of the first art criticism, published in *Correspondance littéraire*, a French journal for the cultured aristocracy, critical reviews of the works displayed in the Salons, the official exhibitions of the Academy, which took place every two years in the Salon Carré of the Louvre, where they were temporarily exhibited and became known as Salons. In 1737, thanks to the finance minister Philibert Orry, the Salon was established regularly and was received with the enthusiasm of a popular triumph. Its importance also lies in being the first institutionalised exhibition in Europe to be opened up to the public free of charge, in a secular context with a completely aesthetic approach.

The French Academy established for the Salons a hierarchy of genres that ranged from what was most transcendental for Art, the painting of stories whether profane, religious or mythological, to portraiture, the painting of the everyday genre, landscape and lastly, and least importantly, still life. It also indicated that the hierarchy arose from that which required the most imagination and creativity, for which the most talent was required, compared to what was considered a mere copy of reality. That is to say, the official arts considered scientific illustration and other similar themes to be barely more important than the work of simple craftsmen.

In 1789 the Parliament created the world's first public, national and free museum, which opened its doors to "all studious and curious persons". It was called the Museum of the Revolution, today the Louvre Museum.

The president of the Royal Society, Sir Hans Sloane, whose collections were one of the cornerstones of the founding of the British Museum, was a dedicated collector of more than 100,000 specimens of natural history, books, antiques, trinkets, images, medals and coins.

This collection was acquired by the British government, as shown in the museum's founding charter of 7 January 1753. For us it is important to underscore that before the invasion of Egypt by Napoleon's army there was already in the West a reduced traffic of Egyptian antiquities for private collections. For example, the Sloane collection possessed 160 Egyptian pieces. Nothing comparable, in number and quality, to the collections of the English consul Henry Salt, parts of which he sold to the British Museum in 1823 and to the Louvre in 1825.

Years before the founding of the first museum, the Kunstkamera of Saint Petersburg in 1727, the first treaties and studies on museology had already appeared, realised by the German merchant Gaspar Neickel. In his pages he provided initial regulations on how to display objects, what an exhibition room should be like, the furniture, the conservation and study of the works; he also discussed the issue of classifying objects in a collection into *Naturalia, Artificialia* and *Curiosa*. The work was clearly influenced by other previous ones that described the contents of some private cabinets of curiosities from previous centuries.

Also in this century we see the Grand Tour reach its pinnacle; the first daily newspapers; modern auction houses such as Christie's and Sotheby's. Baumgarten published his *Aesthetica* in 1750; we see scientific archaeology applied to Herculaneum and Pompeii; Winckelmann's *History of the Art of Antiquity*; the publication of art catalogues and the trade in artistic products in a sector of the population that was no longer either the clergy or the aristocracy.

The exhibition *A Promised Land: From the Age of Enlightenment to the Birth of Photography* starts with two chapters of the Encyclopaedia, or a *Systematic Dictionary of the Sciences, Arts and Crafts*, commonly known as the *Encyclopédie* of Diderot and d'Alembert. This editorial project published from 1751 onwards illuminated the Age of Enlightenment through its quest for Reason above all things. Its volumes are a synthesis of the lexical, scientific, historical and critical knowledge of what in the mid-18th century constituted the most transcendental study of learning undertaken up to that point in time. Its more than 70,000 articles and 2,800 plates revealed a way of doing things that changed the origin, validity and description of human knowledge. History was presented uncoupled from sacred history, philosophy separated from theology and, lastly, theoretical subjects were studied under a perceptible and demonstrable prism. Engravings and their explanations added a form of scientific representation in which clarity and precision were paramount. The exhibition displays *l'Anatomie* and the exterior universe, *l'Astronomie*, two scales that indicate the ambition to explain absolutely everything through a scientific approach.

The need for scientific precision made it imperative to specialise, with expert draughtsmen and engravers producing a vast quantity of illustrated volumes and compendia containing virtually everything to be found on planet Earth. Botany was the most numerous one by some margin. The popular success of the herbariums of either amateurs or specialists, together with the publication in 1735 of *Systema Naturae* by Carl Linnaeus, in which he presented his new taxonomic classification system for the animal, plant and mineral kingdoms, rapidly became the principle around which the collections were organised.

In the exhibition we can view the works of one of the major botanical draughtsmen, Dionysius Ehret, with his album *Plantae Selectae* published from 1750 onwards; followed by the work of Friedrich Bertuch from 1790, consisting of original watercolour drawings later used in the children's encyclopaedia *Bilderbuch für Kinder*; then an unusual field notebook made by the amateur botanist Robert Dowson Rylar, with 143 plates of flora executed with ink and watercolours. We can then peruse the work of Theodor von Esenbeck, a German botanist and the author of the albums *Plantae Oficinales* from 1821. He is remembered for his research into the medical properties of plants. Lastly, *Orchidaceae of Mexico and Guatemala* by James Bateman, dating from 1837, which presents the most varied specimens of orchids.

For Fauna we present *Histoire naturelle des perroquets* by the French artist François Levaillant, published in 1801 and drawn in their natural habitats.

Of urban architecture, with its monuments, ruins or areas of interest, we display several albums. The first one is the mid-century tour of Rome by Giambattista Piranesi. His *Vedute di Roma*, a vast fresco of the city, combines the scientific contemplation of the architect with the technical precision of the engraver and the gaze of the visionary.

In the urban plates describing Spain, we first present *Voyage pittoresque et historique de l'Espagne* by Alexandre de Laborde. The author, a protégé of Lucien Bonaparte, travelled in the peninsula from 1800 to 1805, describing its significant monuments and sites. The second work is *España artística y monumental* by the Ferrol artist Jenaro Pérez de Villaamil, an interaction between architectural detail and the romantic aesthetic.

Of the monumental and urban scenario of the Orient, three authors are on view:

As a lead-in to the *Description of Egypt*, we present the album *Travels in Upper and Lower Egypt* by Vivant Denon. Invited by Napoleon to take part in his Egyptian campaign as part of the Arts and Sciences Commission, in 1802 he published the book with plates and text on the military and scientific campaign.

Then Léon de Laborde, son of Alexandre de Laborde, with his *Journey through Arabia Petraea* from 1830, which contains the first view the West had of Petra.

Of the artist. painter and draughtsman David Roberts, in the exhibition we show his oriental works: *The Holy Land* and *Egypt & Nubia*, published in the 1840s, although he spent the previous decade travelling through these places. His images imbued with romanticism coexist with the detailed and precise representation of the daguerreotype, which at the time was being disseminated around the world.

And we end this chapter with the Monuments of Egypt and Nubia, the work of the scientist Jean-François Champollion, the first Egyptologist to succeed in deciphering the hieroglyphs in 1822. The author achieved his dream of knowing Egypt first-hand, participating in a Franco-Tuscan expedition. Champollion was the first of many later ones in being able to decipher, understand and date the scenes on the walls of Egyptian temples and tombs. His album was published in 1835.

To finish, two works produced in America.

There are not many scientific and intellectual figures, in the transition from the 18th to the 19th century, who can compare with the existence, legend and literary legacy of Alexander von Humboldt; in this exhibition perhaps only Champollion.

In 1810, his book *Views of the Cordilleras and Monuments of the Indigenous Peoples of the Americas*, which we display in the exhibition, revealed the first scientific descriptions of archaeological remains and ruins of pre-Columbian America to a large part of the western world.

And we end this room with Luxembourg-born captain Guillermo Dupaix. A military man of the Almansa dragoon regiment, he obtained permission to go to America and from 1791 to 1804 documented the pre-Hispanic past together with a New Spain draughtsman and illustrator. His publication "*Antiquites Mexicanes...*" featured the drawings of the Mexican draughtsman Luciano Castaneda. He also headed the Royal Antiquarian Expedition of king Charles IV between 1805 and 1809. Two editions of his work were published, that of Lord Kingsborough in 1831 and that of Henry Baradère in 1834, which includes the drawings of the Mexican draughtsman Luciano Castaneda. Both are on display in the show.

The next section of the exhibition covers the *Description of Egypt*. In the context of the French Revolution, the wars that followed, the confrontation between England and France, and later the fall of the First Coalition, England rearmed and strengthened its navy and army. Although the Directorate thought it possible that Napoleon would invade Great Britain, the superiority of the British Royal Navy made this

The Description of Egypt. Plates. Antiquities 1, Cover Page. Drawing: Cécile. Engraving: Girardet and Sellier, and Réville, 1809.

unworkable. Napoleon decided to change his plans and chose to invade Egypt, seeking to ensure French dominance in the eastern Mediterranean and weaken Great Britain in India while putting the French public coffers back on a sound footing.

French diplomats and military men deemed Egypt to be a feasible and certain conquest due to its vulnerable position between the Ottoman Empire and Mamluk control as well as the lack of an organised army and the absence of a strong administration. The Directorate secretly approved Napoleon's mission to conquer Egypt and he departed with a large contingent of troops, 167 *savants* or French scholars and nearly 2,000 artists, all forming a scientific, intellectual and artistic commission.

At three in the afternoon of 19 July 1798, a cannon salute at the Toulon base indicated the departure of the principal fleet. On 9 June the vast fleet assembled for the invasion of Egypt under the command of Admiral Brueys besieged Malta. Three days later the island's capitulation was complete. Bonaparte, who was financially strapped, gained more than seven million francs with this conquest.

The fleet reached the city of Alexandria on 1 July. Bad weather and poor planning greatly hindered disembarkation. While Bonaparte immediately took the southerly direction, Admiral Brueys anchored the thirteen ships of his flotilla in the bay of Aboukir.

After an arduous desert crossing, 25,000 French soldiers reached Embabeh, in close vicinity to Cairo. Waiting for them were the troops of the Beys, Murad and Ibrahim, comprising around 40,000 soldiers. This was what the world remembers as the Battle of the Pyramids and Napoleon's famous and legendary exhortation: *From the summit of these pyramids, forty centuries look down upon you.*

Combat ended in less than two hours with the Egyptian defeat. Nearly 2,000 mamluks and thousands of falahs lost their lives. The battle opened the way to Cairo for Bonaparte and his army, who entered the city on 24 July. The young general immediately started building works in the city and acted as if he were the sovereign of this conquered land.

On 1 August, a month after the French landing, the British admiral Nelson located the French sails in the bay of Aboukir and that same afternoon attacked the enemy fleet. The French defeat was comprehensive. Bonaparte's Egypt army was isolated; it had no outlet to the sea, nor could it receive supplies from Europe.

The defeat in this battle led Napoleon to take the perilous decision to attack the Mediterranean coast of the Ottoman Empire, which caused the French to seize the initiative after the Turkish sultan's decision to support England and not France. Although they reached Acre in a battered state, they had to turn around and return to Cairo.

Napoleon Bonaparte realised that a Second Coalition was being formed on the European continent, while in France internal tensions were weakening the country. Recognising that his Egyptian campaign had been a failure and that there was no tangible benefit in continuing, Napoleon took care to stay out of what was about to occur in the lands of the Nile.

On 23 August 1799, Bonaparte secretly boarded the frigate Muiron in Alexandria, leaving the command of the French forces to general Jean-Baptiste Kléber. He was succeeded by general Menou, who was unpopular and incompetent, and he could not prevent the landing of an extensive British army headed by general Ralph Abercromby. On 28 July the Cairo garrison surrendered and general Menou relinquished his forces in Alexandria on 2 September 1801. In accordance with the terms of the surrender, the surviving French troops were allowed to return to their native land.

The 167 sages who comprised the scientific commission had the responsibility of undertaking an exhaustive investigation of Egypt, encompassing all historical, natural, architectural, antiquarian and other aspects right up to the country's present situation. This was a task that had to be carried out, in anticipation of a possible long-term occupation by France or the possibility that it would become its province.

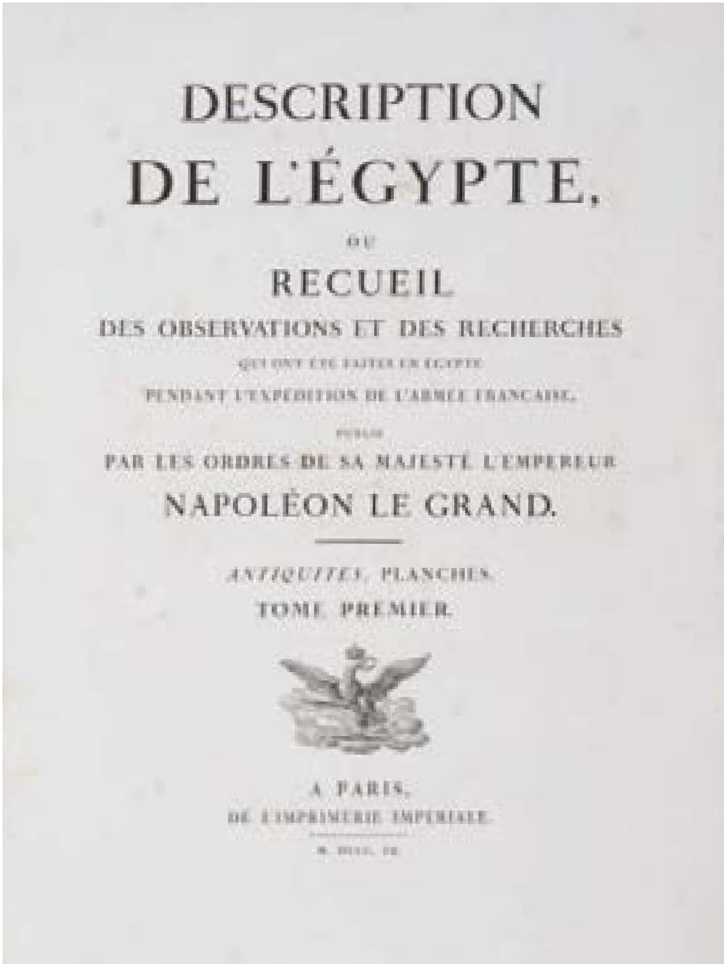
In August 1798 a decree became the constituent act for the Institute of Egypt, following the model of the Institut de France in Paris, which had the principal aim of promoting the scientific Enlightenment in Egypt. The institution's goals were set down in writing: to promote and disseminate the Enlightenment in Egypt and to investigate, study and disseminate the country's natural, industrial and historical circumstances. During the winter of 1798 explorations were conducted in Lower Egypt, together with practical projects, including the creation of a printing press that would work with the Arabic characters removed from the Vatican during the Italian campaign. This allowed the publication of bilingual works, such as propaganda bulletins and materials for learning Arabic. The printing press also produced two important publications: *La Décade Égyptienne* and the *Courier de l'Égypte.*

The scientists who acted for almost four years under the Arts and Sciences Commission and the Institute of Egypt also had to face the dangers of the military expedition while compiling observations, notes and drawings. They sometimes travelled solo, but most of them worked in pairs or in a group protected by a military escort. They continued to produce reports and iconography until Menou's surrender in Alexandria in August 1801.

Early 1802 saw the start of the editorial adventure facilitated by the works and documentation saved from the English confiscation in Alexandria, when the British took possession of the antiquities gathered by the French *savants*, among them the most important one, the Rosetta Stone. In February 1802 a decree issued by Napoleon, who wanted a collective publication of these works and not their dispersion in individual publications, stipulated that all written elements, plans and drawings made during the Egypt expedition would be published at the expense of the State.

The publication would appear under the title of *The Description of Egypt* or *Collection of observations and researches which were made in Egypt during the expedition of the French Army, published by the order of His Majesty the Emperor Napoleon the Great*. The work's lengthy title is an indication of the striving for precision derived from the Age of Enlightenment.

The 23 volumes which make up the text and plates are segmented into three parts: a section called "Antiquités", representing the pharaonic monuments and sites; another one denominated "Histoire Naturelle", which encompasses Egypt's flora and wildlife; and lastly the section "État



DESCRIPTION
DE L'ÉGYPTE,
OU
RECUEIL
DES OBSERVATIONS ET DES RECHERCHES
PENDANT L'EXPÉDITION DE L'ARMÉE FRANÇAISE,
PAR LES ORDRES DE SA MAJESTÉ L'EMPEREUR
NAPOLÉON LE GRAND.
ANTIQUITÉS, PLANCHES.
TOME PREMIER.
A PARIS,
DE L'IMPRIMERIE IMPÉRIALE.

The Description of Egypt. Plates. Antiquities 1, 1809.

Moderne", devoted to the activities and customs of modern Egypt.

Nicolas Jacques Conté, charged with supervising the engraving work together with other Egypt expeditionaries, was charged with publishing the *Description* and urged and helped the engravers in Paris to make the effort to project a scientifically objective approach based on the drawings made by the scholars in the lands of the Nile.

This publication was to become a bibliographic jewel admired throughout Europe. As well as a new and unprecedented encyclopaedia on all past and present knowledge of Egypt, it became the starting point for a new discipline, Egyptology.

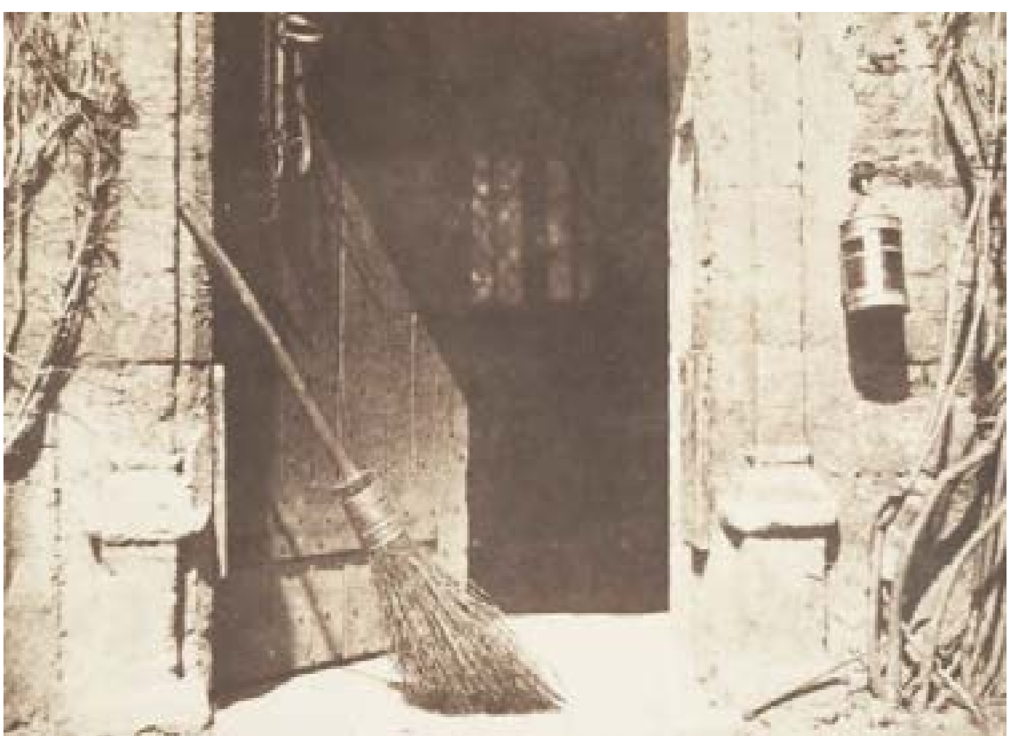
François Arago, A French astronomer, physicist and statesman, presented the birth of photography in his address on the daguerreotype to the Chamber of Deputies and later the Academy of Sciences in July and August 1839. Of this transcendental speech, which led to Daguerre and Niépce's son being granted an annuity and to the world using the invention free of charge, we want to highlight a few valuable and insightful words from the discourse. Arago says:

> While these pictures are exhibited to you, everyone will imagine the extraordinary advantages which could have been derived from so exact and rapid a means of reproduction during the expedition to Egypt; everybody will realise that had we had photography in 1798 we would possess today faithful pictorial records of that which the learned world is forever deprived of by the greed of the Arabs and the vandalism of certain travellers. To copy the millions of hieroglyphics which cover even the exterior of the great monuments of Thebes, Memphis, Karnak, and others would require decades of time and legions of draughtsmen. By daguerreotype one person would suffice to accomplish this immense work successfully. Equip the Egyptian Institute with two or three of Daguerre's apparatus, and before long on several of the large tables of the celebrated work, which had its inception in the expedition to Egypt, innumerable hieroglyphics as they are in reality will replace those which now are invented or designed by approximation. These designs will excel the works of the most accomplished painters. Since the invention follows the laws of geometry, it will be possible to re-establish with the aid of a small number of given factors the exact size of the highest points of the most inaccessible structures.

Important words that emphasise the erroneous interpretation of the hieroglyphs by illustrators and engravers who were never in Egypt, compared with the exactness of the photographic images, well-defined and true to the original. This represented the starting point in the understanding of the photographic phenomenon and its direct influence on the construction of new visual representations of reality.

Consequently, what at that time was conceived as the representation of reality was to undergo a radical shift with the dissemination of the daguerreotype across the world. The multiple manifestations of life, territories, objects, monuments, in short, the representation of phenomena observable by the human eye, would only appear to be accurate if captured by a photographic device. The daguerreotype was thus a unique photograph on a metal plate with a silver surface, of which no copies could be made unless through drawing and then engraving. The dissemination of the daguerreotype was succeeded by the calotype, a procedure on paper, simpler to execute, which also allowed for multiple prints from a single negative. However, William Henry Fox Talbot privately patenting it in 1841 slowed down its dissemination. In 1851, when the patent was liberated, the procedure that allowed copies to be made on photographic paper would become the majority procedure. A decade later it was replaced by the glass plate coated in wet collodion, a

Lerebours. San Juan de Acre,
engraving, 1840.



William Henry Fox Talbot,
The Open Door, salted paper, 1844.

Girault de Prangey, Alexandria. Pompey's
Pillar, daguerreotype, 1842.

Anna Atkins, Ulva latissima, cyanotype, 1853. / William Henry Fox Talbot, A Spruce Fir Needle Cascade, photogenic drawing, 1839.

procedure developed by Frederick Scott Archer that combined the precision and sharpness of the daguerreotype with the possibility of making thousands of photographic prints from a single negative.

On the origin of photography, the University of Navarra Museum published in February 2024 the trilogy *Seeking the Impossible*, a selection of texts that throws light on the origin of the photographic image. It was edited by professors Martí Llorens and Rebecca Mutell, with text translation by Ana Galán.

In the first Photography room we can view some examples, with the work of pioneers in this medium such as Henry Fox Talbot and Anna Atkins.

In Talbot's photogenic drawings, as in the cyanotypes of the botanic scientist Anna Atkins, it was the precision of the procedure to record without a camera on photosensitive emulsions that captured the presence of a real object, such as seeds, algae and plants, leaving their mark with an extraordinary level of detail and precision. These compositions were, in Talbot's words, "*the art found in nature*". In the photographs "The Open Door" and "The Haystack".

The author shows objects and composes scenes that had never hitherto been of interest, marking the start of a huge change in the iconographies that had been dominant up to that time.

In the exhibition of the first procedure, the daguerreotype, we can also view plates of the Daguerrean Excursions of Nöel Lerebours, which are none other than engravings made from daguerreotypes that today remain missing. We can also compare the two techniques used by a same author, the daguerreotypes and the engravings of Girault de Prangey. These images mark the start of photography's journey to the Orient.

The title of the *A Promised Land* exhibition refers to this journey made by photography from the East to Spain, from the Orient to the European south. Or the reverse trip, where many photographers started from southern Spain and travelled to the eastern Mediterranean. In the exhibition, photography follows the route started in Alexandria, sailing upstream on the Nile, and the one started in Constantinople, travelling to Palmyra, Damascus, Jerusalem, Alexandria and continuing along northern Africa, stopping in the Hispanic cities of Al-Andalus. It was the Reales Alcázares in Seville, the monumental complex of the Alhambra in Granada and the Mezquita of Córdoba that would constitute the so-called "Orient to the South", the end point of the journey on which this show takes you.

For photography, the journey to the Orient figuratively ends where the section starts in the Museum's collection devoted to the calotype in Spain, essentially by French and English photographers who toured Spanish territory attracted by its Arabic past and its Islamic architecture. Of those early calotypists, selected for the exhibition are Gustave Beaucorps, Alphonse Delaunay, Louis De Clerq, Edward King Tenison, Francisco Leygonier and Hugh Owen, establishing typologies, generating stereotypes. If photography in its origins was the vehicle for creating an image of what exists, of making the

Alphonse de Launay, Seville, Courtyard of the Alcázar, salted paper, 1853.

Alphonse de Launay, School of Bolera Dancer, salted paper, 1853.

invisible visible, it would also make Spain visible. The gaze, the viewpoint, was to be established with the same characteristics as photography's journey to the Orient. A vision of the oriental, of what is different as a discovery.

This gaze directed at the monumental principle by the best calotypists who travelled to Egypt and the Holy Land, such as Maxime du Camp,

Auguste Salzmann and others, was completed with the human types and Costumbrist scenes thanks to improvements in photographic techniques such as collodion, which provided far greater definition and could halt slight movements in the figures being portrayed. It was Sir Francis Frith, an English photographer who, after travelling in Egypt from 1856 to 1859, in 1860 established in Surrey the first company engaged in the mass production of photographs.

Gradually, from the 1860s onwards, many western photographers settled in the major cities of Egypt, Near East and Turkey, producing photographs for the tourism sector. In the second half of the 19th century tourist travel to Egypt had created strong demand for photographs as souvenirs. Among the first photographers in Constantinople and Cairo to capitalise on this demand were Gustave Le Gray, the brothers Henri and Emile Bechard, the Italo-British brothers Antonio Beato and Felice Beato and the Zangaki brothers, of Greek origin.

Practically at the same time they were joined by local photographers, especially those who opened establishments in Constantinople, such as the Abdullah brothers, Pascal Sebah, the French photographer Félix Bonfils, his wife Marie-Lydie Cabanis and their son Adrien, all of whom very quickly saw the possibilities of photography as souvenirs for the tourists who had started to travel to Egypt. With the development of tourism, of tourist travel, these photographers either moved to Cairo or settled in both cities, photographing images of ruins, monuments, architecture, oriental types or picturesque scenes. The quantities of images produced by the photography establishments would eventually become very numerous, an expansion of the industrialised photography initiated by Frith a decade earlier. This is why in the exhibition we sought to clearly manifest how prolific the work of such authors was, deploying polyptychs in which to observe the themes and repertoires of the establishments that sold photographs. These photographers fed the orientalist desire unleashed among European and American publics, who constituted the numerous groups of tourists who arrived in Egypt after the opening of the Suez Canal in 1869.

A Promised Land ends its overview in the late 19th century with the emergence of colour procedures, long sought by many photographers and scientists, for they completed the

Maxime du Camp, Untitled (Temple of Jupiter at Baalbek), Salted paper, circa 1850.

Photocrom Zurich, Cairo, Egyptian Barber in His Shop, photochromy, c. 1888.

image of realism and veracity of the medium. The show includes the first photographic colouring processes using the three-ink technique patented by Photochrome, which was acquired by the son of Louis Bonfils.

And with the boom in postcards, with the new amateur photography practices thanks to Kodak cameras, where you only had to press a button and they did the rest.

All this led to the disappearance or transformation of almost all of those photography houses that sold images and which are an important part of this exhibition.

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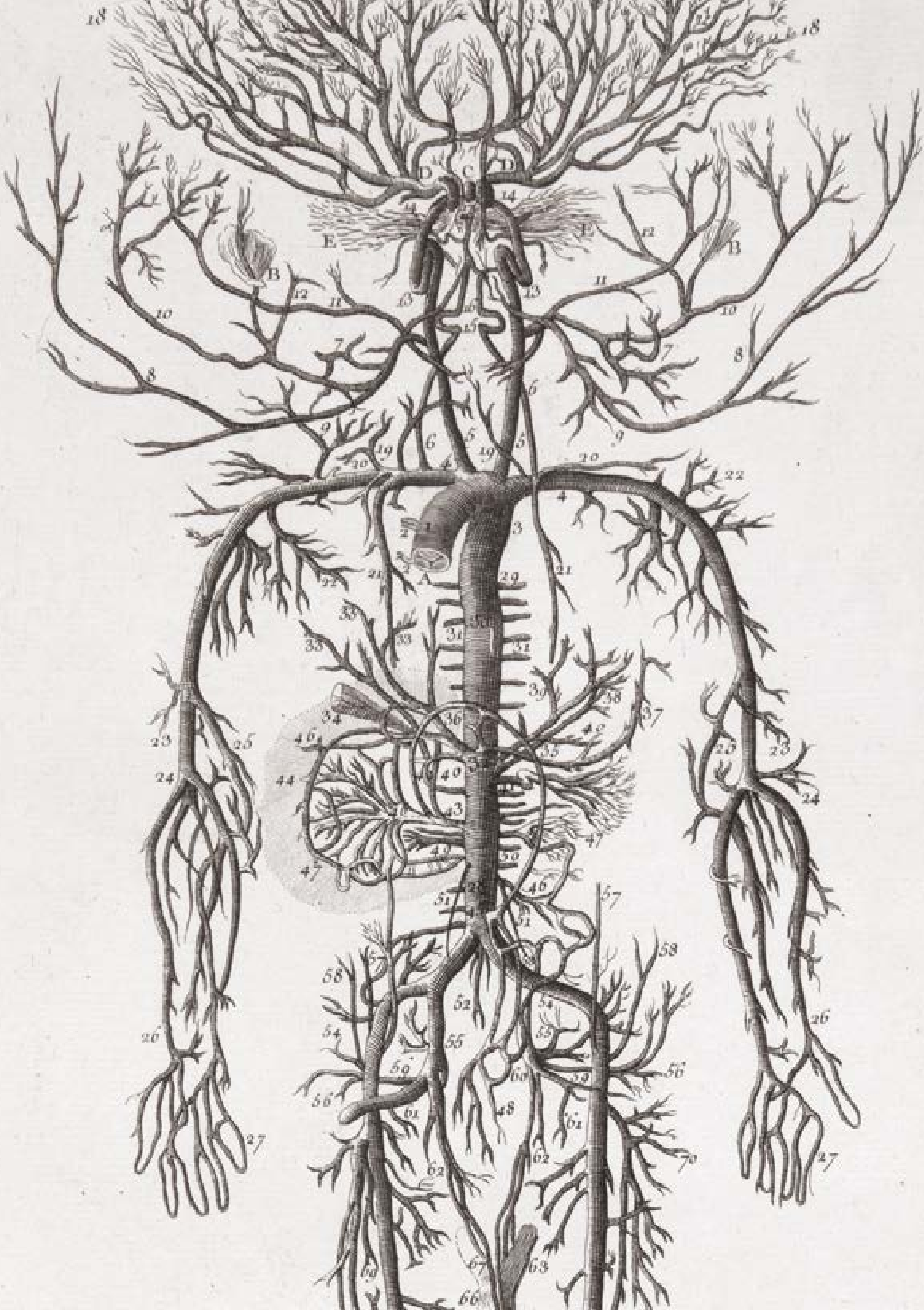
TRAVELS AND SCIENTIFIC EXPEDITIONS OF THE 18th AND 19th CENTURIES

TEXTS BY
Ignacio Miguéliz



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THE IMAGE AT THE SERVICE OF SCIENCE

From Drawing and Engraving in the Age of Enlightenment to Photography

Ignacio Miguéliz

The exhibition *A Promised Land. From the Age of Enlightenment to the Birth of Photography* features some of the milestones that, from the 18th century onwards, led to the invention of photography and its enshrinement as a defining feature of modernity. Since the start of the Modern Era, European man experienced an interest in the knowledge of the world and of the other, which would attain its fullest development in the seventeen-hundreds thanks to political stabilisation in Europe, the establishment of peaceful relations with the Ottoman Empire and the advance of science and empirical observation. All of this gave rise in the 18th century to the birth of the Enlightenment and the triumph of Reason, which would generate social, political and economic changes that would transform the world, prominent among them the French revolution or, in the 19th century, the Industrial Revolution. In the second half of the 18th century more and more voices were calling for a social, political and artistic renewal, the end of the governing system and of the prevailing relaxation of customs and social corruption, seeking a return to traditional values and rectitude of behaviour, driven by the ideas of the enlightened such as Denis Diderot (1713-1784) or Étienne La Font de Sant-Yenne (1688-1771), a sentiment captured in the painting of Jacques Louis David (1748-1825), who was to become one of the lights of the revolutionary movement. The ideals of political and moral renewal turned its eyes to the Roman era, initially to the republican and later to the imperial period but also, and for the first time, to Greece and other ancient civilisations disseminated by artists and scientists, who provided the models for the sought regeneration.

Science and art thus became established as the drivers that would lead to the progress of humanity and which generated a new social and political framework. In this regard, the 18th century saw an increase in publications, editions that sought to gather up universal knowledge and learning compiled thanks to the development of scientific research in which the impulse given at the time to scientific and exploratory expeditions occupied a central place. These publications were interconnected through either scientific texts illustrated with plates or through repertoires of engravings, encompassing all the fields of science, from everything relative to man to the universe, subjects to do with natural history such as flora or wildlife, and Humanity. This last topic, often identified with the generic name of Antiquities, was to achieve considerable development, becoming one of the drivers of scientific research and the development of the scientific and illustrated engraving. Thus, in the course of this century, the interest awakened in past civilisations would generate the research and study of the ruins of antiquity according to a scientific methodology that included the systematic cataloguing and inventory of the remains found. Classic Rome would continue to be one of the principal centres of attraction, as politically it would be the mirror of this new society, while artistically modern Rome remained an inexhaustible field for research, as there one could study both the remains of classical antiquity and the major works created during the Renaissance and Baroque centuries. It was at this time that the ruins of Pompeii and Herculaneum were discovered. These cities were excavated between 1737 and 1748 under the patronage of Charles VII (1716-1788) of Naples and Sicily, the future Charles III of Spain. These excavations, and the work of the German archaeologist Johann Joachim Winckelmann (1717-1768), laid down the methodology of modern archaeology. The study and observation of classical cultures and ancient civilisations would not be the only reference and example in regard to the social, political and religious regeneration being experienced at the time, for after Napoleon's defeat in 1815, Europe would also turn its eyes to its medieval past in a quest for its vernacular roots of primitive Christianism uncorrupted by civilisation, in contrast to and rejection of the Enlightenment and Classicism associated with Reason and the laicism generated by the French revolution and the wars that had devastated Europe. Both Johann Wolfgang Goethe (1749-1832) and the Jena School in Germany, like François-René, Viscount of Chateaubriand (1768-1848) in Francia, advocated the return to the natural, to nature, as opposed to rationalism.

As for the publication and representation of subjects in branches to do with natural history, they were to be greatly influenced by the works of the Swedish scientist, botanist and zoologist Carl Linnaeus (1707-1778), who in 1735 published *Systema naturae*, the first of a series of works in which he presented his new taxonomical proposal for the animal, plant and mineral kingdoms, developing a binomial nomenclature system for the classification of living beings. This scientist's research and publications laid down the scientific research methodology and codified the system for the classification of species, adapting the terminology in Latin as the language inherent to science. Throughout the 18th century, publications on these subjects were to enjoy a strong development, often tied to the travels of scientific and exploratory expeditions such as those undertaken by Cook, La Perouse, Malaspina, Mutis, Humboldt or Darwin, who travelled the five continents on a quest for new species while studying and classifying the known ones. Equally, scientific research was developed and strengthened in European universities, academies and institutions, seeking to find the explanation of the world through them. One of the fields in which studies and investigations succeeded each other throughout the 18th century was that of photochemistry, with progress being made in the field of reactions to the light of various solutions, which a century later culminated in the birth of photography.

Relative to the illustrations which were compiled in these publications, they did not limit themselves to collecting beautiful, curious or exotic images but also, for the first time, they were scientific in nature, with the images explaining the different texts which they accompanied. What these publications sought to do was to rigorously capture the empirical knowledge of the world through drawings and engravings, aiming to expand humanity's horizon and seeking to show the represented object or theme in the most exact and truthful way possible. Scientific illustration announced the existence of a reality with guarantees of legibility, credibility, correspondence with and exactness of the represented objects. This is why such images, in the making of which they often resorted to optical instruments such as the camera obscura or the camera lucida to facilitate correspondence and exactness in the drawing, are considered to be proto-photographs, the precursors that facilitated the emergence and acceptance of the photographic phenomenon in the 19th century. Throughout the seventeen-hundreds, partly continued in the eighteen-hundreds, multiple expeditions travelled the five continents and scientifically collected others' knowledge to present it before the eyes of European man who, for the first time, discovered in a truthful manner all that surrounds him, not only exotic and distant worlds in Africa, America and Asia but also in Europe itself.

All of this knowledge was amassed in files and reports illustrated with drawings and engravings, for the advances in science and in the empirical observation of the world demanded that all these new presented data be accompanied by images that would provide a view of them. In this regard, even Diderot in the introduction to the *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers* (*Encyclopaedia, or a Systematic Dictionary of the Sciences, Arts and Crafts*), insisted on the importance of images in the scientific discourse: "*The general lack of experience, both in writing about the (mechanical) arts and in reading things written about them, makes it difficult to explain these things in an intelligible manner. From that problem is born the need for figures. One could demonstrate by a thousand examples that a simple dictionary of definitions, however well it is done, cannot omit illustrations without falling into obscure or vague descriptions... A glance at the object or at its picture tells more about it than a page of text.*" It was in fact the publication of this work in France, directed by Denis Diderot (1713-1784) and Jean le Rond d'Alembert (1717-1783), that would lay the foundations for the methodology to be followed. It was responsible for a change, both cultural and in thinking. This work was born with the vocation to systematically collect the knowledge of the time, and did so through a didactic approach, articulating a duality of volumes containing text and images, in such a way that one explained the other and vice versa. Seventeen text volumes were published in total between 1751 and 1765, and nine volumes of plates between 1762 and 1772, containing the knowledge of the era with criteria that secularised universal knowledge, using an empirical method based on applying reason to all levels of existence, in this manner laying the foundations for universal knowledge. Together with the *Encyclopaedia*, numerous scientific expeditions enabled the interpretation of the modern world, employing in this both the sciences and the arts, which walked hand in hand in the new society that was emerging after the French and industrial revolutions. In these expeditions, and in their intention to collect all this information systematically, with detail and exactness, art supported science, which was to culminate in the 19th century in the birth of photography. This technique was presented by the politician, scientist and academic François Arago (1786-1853) in Paris in 1839 at the Academy of Sciences as ancillary to science. However, right from the moment of its birth, photographers such as Gustave Le Gray (1820-1884) championed photography as an artistic discipline, the youngest of the arts, and not as a mechanical technique. But there were also many voices, among them that of Charles Baudelaire (1821-1867), which considered photography as a mere technique serving science and the arts to document the world, one that brought to light the resources that progress and modernity were placing at the service of mankind. It would not be until 1862, in the context of the Mayer-Pierson trial, that the French state recognised photography as an artistic discipline henceforth protected by copyright laws.

Along the route travelled by art and science during the 18th and 19th centuries, a visual culture arose that would evolve until the present day in the quest for detail, definition, precision, exactness and correspondence with the represented objects and phenomena. All of these concepts were to develop ideas such as credibility and veracity, which would define a rapprochement to the description of the new scientific achievements that would expand the notion of "reality" or of the "real" that would be the principal argument from the start of modern art to present-day art. In line with this, the storyline that defines this exhibition and the collection of the University of Navarre Museum is precisely the construction of the image, the manner of showing reality by art and artists, and the interpretation made of this by the spectator, and how through the image we perceive the other, the others, and ourselves. We thus see the birth of photography as one of the constituent acts of the new direction taken by art, moving definitively away from the systems of signification and description of interposed realities that characterised the arts until the early 19th century, where they offered a representation tied to the subjective.

Until the emergence of photography, all this knowledge was depicted through drawing, then transferred to engraving, allowing it to be reproduced innumerable times, a quality later shared by photography. Because of this, scientific expeditions and voyages of exploration would include not only scientists but also artists, with the latter on occasion being the first, thanks to their multidisciplinary character, to make the illustrative drawings of the discoveries being made. These scientific and expeditionary voyages were generally defrayed by different institutions, by the Crown and by governments, by the recently created Academies or by circles of intellectuals and dilettantes, who then published the results. At the genesis of such voyages was the intention of collecting the represented objects or themes in a truthful manner, with details, in the most realistic way possible and with a scientific approach. In this manner, flora, wildlife, archaeology, antiquity, art, culture, society, images of exotic and mythicised worlds of Africa, Oceania, Asia or America but also of Europe, were published in albums made available to the European public, who were enraptured in the contemplation of other realities, expanding their horizons, marking the advent of a new society and of the modern world.

To this end, the exhibition is divided into different areas that explain the course from the objective representation of the world through drawing and engraving to the change that the birth of photography brought about. The first of these areas is devoted to the albums published with the repertoires and compilations of images generated by the investigations and scientific travels and exploratory voyages of the 18th and 19th centuries. And of course the starting point could be no other than the Encyclopaedia of Diderot and d'Alembert, specifically the volumes devoted to Anatomy and Astronomy, which study man and the universe, two scales indicating the ambition to explain absolutely everything from the standpoint of scientific knowledge. Through these albums we can ascertain how in the course of these centuries art and science walked hand in hand, encompassing the different fields of knowledge, just as how, in representing the research that scientists were conducting, use was made of the aesthetic solutions of formal and plastic beauty in art, specifically drawing and engraving. Botanical studies thus pin down the compilations of plant drawings by Robert Rylar, an amateur botanist, or Friedrich Bertuch, who came up with a natural history encyclopaedia for children. Presented together with these two logbooks of drawings are compilations of engravings such as those of the medicinal plants of Theodor Friedrich Esenbeck, the album of Christoph Jakob Trew and Georg Dionysius Ehret, in its time considered to be one of the best books on botany published in Germany, the same consideration given in England to the publishing of the compilation of orchids from Mexico and Guatemala by James Bateman, who sponsored the exploration to collect these plants, which he then planted in the gardens and greenhouses built at his residence. Linked to natural history, but in the branch of ornithology, is the compilation of parrots made by Francois Le Vaillant, who was opposed to the Latin nomenclature of species effected by Linnaeus and used a denomination in French, while nature and antiquity are combined in the work on Mexico by Alexander von Humboldt, a scientist and polymath deemed to be one of the fathers of modern geography.

In regard to the disciplines associated with history and art, the image of ancient, Mexican, Egyptian, Nabatean or Roman civilisations populate the pages of these albums, but also the compilations of the vernacular, the cultural roots of each nation. The image of the Egypt of the Pharaohs, which was to have so much importance in 19th-century Europe, was taken by Dominique Vivant Denon, one of the fathers of modern Egyptology and museology, a member of Napoleon's expedition to Egypt and the first director of the Napoleon museum, and Jean-François Champollion, to whom we owe the transcription and deciphering of the language of the hieroglyphs. The vistas of Petra by Léon de Laborde are the first images of this civilisation to have reached Europe. We owe Mexican antiquities to Edward King, Viscount Kingsborough, who commissioned the compilation of extant material on ancient Mexican cultures in manuscripts and publications conserved in different European libraries, and Guillermo Dupaix, a military officer and explorer at the service of the Spanish king Carlos IV, who toured Mexican cities. To the works compiled by these two authors we must add the images included by Humboldt in his oeuvre. But not only the remains of distant and exotic civilisations were compiled, Europe, too, was the subject of the curious gaze of enlightened intellectuals. Thus one of the most in-demand series during these two centuries were the views of Rome, both ancient and modern, by Giovanni Battista Piranesi, one of the great engravers of his era, while Alexandre de Laborde and Genaro Pérez Villaamil did the same with Spanish monuments in engravings that, as well as disseminating the image of these cities and countries, gave rise to the way they were viewed and understood by others. The birth of photography, which in a supposedly accurate and real manner captured the represented objects and elements, shared with engravings an iconographic interest and themes to be represented, allowing artists to make a more personal interpretation of exotic worlds, as we can see in the views of Egypt, the Holy Land and Spain by David Roberts.

In this enlightened and encyclopaedic spirit, one of the most ambitious projects undertaken in the context of these expeditionary and scientific voyages was the *Description de l'Égypte, ou Recueil des observations et des recherches qui ont été faites en Égypte pendant l'expédition de l'Armée française, publié par les ordres de Sa Majesté l'Empereur Napoléon le Grand* (1809-1823) which, for the first time and exceptionally, can be viewed in its entirety at the museum. This publication, espoused by Napoleon Bonaparte (1769-1821), was the inheritor of an interest in documenting the world and is part of the fascination which Napoleon himself felt for ancient arts and civilisations, whose uses and iconographic models he employed as a means to legitimate his power. In 1799 Napoleon, at the request of the French government, headed a military expedition against Egypt which, though governed with a certain degree of independence by the Mamelukes, formed part of the Ottoman Empire, which had allied itself with the British Crown, at the time at war against the French. As well as the coup d'éffect which France hoped to strike against England with the conquest of this territory, which also ensured it control over the eastern Mediterranean and strategic access towards Asia and India, there was an economic motivation, as the prevailing image of Egypt was of a rich country that could help fill the French coffers. In parallel to planning the invasion, a Commission of Arts and Sciences was set up with the purpose of including a group of scientists who had the mission of collecting knowledge on Egypt from the era of the pharaohs up to the time of the expedition. To this end, travelling to Egypt together with the French army were sixty-seven *savants*, learned men, plus nearly two thousand artists, among them engineers, scientists, architects, mathematicians, botanists, painters, engravers and other experts who, over four years, from 1798 to 1801, travelled the country, scientifically and systematically collecting knowledge on it. After their arrival in Cairo, the *savants* installed a printing press, a chemistry laboratory, a physics cabinet, an observatory and rooms intended for the Egypt Institute, among whose goals was the promotion of scientific Enlightenment through the research, study and dissemination of Egypt's natural, industrial and historical realities. Despite Napoleon's defeat and the English seizure of many of the objects collected by the expedition, a great number of data and documents did reach France, allowing them to be compiled and published.

The Description contributed to creating some fantastical oriental imagery in the European mentality that would transform it into one of art's central themes throughout the 19th century. The images featured in this publication served as a guide and gave rise to the birth of photography in the eastern Mediterranean, for from the 1840s onwards, European photographers would travel the country following in the footsteps of Napoleon and the *savants*, taking images that were inheritors of and indebted to those compiled in the *Description of Egypt*, initially repeating those same iconographies and settings. These pioneering European photographers were followed by studios of local photographers, who learned from them and repeated the same iconographies collected by Napoleon's scientists. After the birth of photography, the iconographic approaches of *The Description of Egypt* revealed in many cases their dependency on the hand and subjectiveness of painters and illustrators over a supposed photographic objectiveness. Even François Arago (1786-1853), in the presentation he made of photography at the Academy of Sciences in 1839, pointed out the importance that this new technique had in recording the knowledge of the world in a true and reliable manner, indicating that it would have been of great importance and help to Napoleon and his army of *savants*.

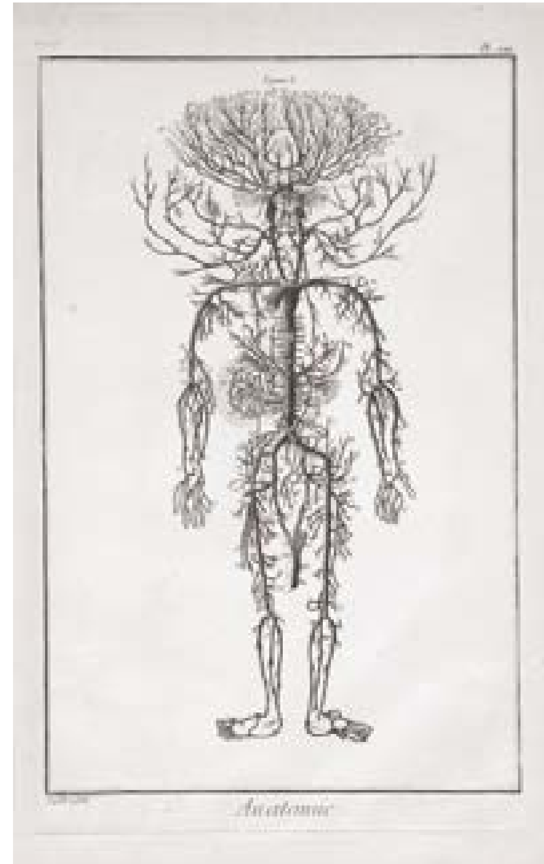
Denis Diderot (1713-1784) & **Jean le Rond d'Alembert (1717-1783)**

Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers, par une société de gens de lettres

Paris, Le Breton, 1751-1772

The *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers* (*Encyclopaedia, or a Systematic Dictionary of the Sciences, Arts and Crafts*), published in France between 1751 and 1772, consists of 28 volumes, of which 17 are texts published from 1751 to 1765 and the other 11 images that saw the light between 1762 and 1772. The work was published in different cities, the most important ones being Paris and Neuchâtel, with the size of the volumes varying between folio, quarto and octavo. The directors of the publication were Denis Diderot and Jean le Rond d'Alembert, collaborating with whom in the drafting of articles were more than 140 authors such as Montesquieu, Rousseau or Voltaire. Diderot and d'Alembert were behind 6,000 and nearly 1,700 articles respectively of the approximately 72,000 which made up the *Encyclopaedia*. Diderot was a writer and philosopher and the host of one of the principal literary salons of his time, while d'Alembert was a mathematician and philosopher. They were commissioned to direct the *Encyclopaedia* by the editor André Le Breton, who initially only wanted to translate from the English the *Universal Dictionary of Arts and Sciences* published in 1728 by Ephraim Chambers. However, Diderot and D'Alembert embarked on a far more ambitious project, one that would become one of the pillars of the Enlightenment: the compilation, from a secular and critical viewpoint, of the knowledge of its time. The *Encyclopaedia* was thus born with the vocation of systematically collecting the knowledge of its era, and did so according to a didactic approach, articulating a duality of volumes of texts and images in such a way that one explained the other and vice versa. Owing to the project's magnitude and diversity of themes, it was not without its problems and critics and was opposed by numerous sectors of society. The first one to oppose it was the Society of Jesus (the Jesuits), who were supported by the Dauphin of France, the king's son and heir. The Society succeeded in having the *Encyclopaedia* included in the index of forbidden books due to the treatment it gave Religion. Even Le Bron, Diderot and D'Alembert ended up quarrelling, with the latter abandoning in 1758 the direction of the *Encyclopaedia*, though he continued to contribute articles. In 1775 Charles-Joseph Panckoucke acquired the rights to republishing the work, with new volumes and editions appearing from that moment on. Among the 28 volumes that make up the *Encyclopaedia* are as many volumes devoted to Anatomy and Astronomy, the former featuring knowledge on the human body and the latter on the universe, focusing on the technical apparatuses that study it, two scales that indicate the ambition to explain absolutely everything from the standpoint of scientific knowledge.

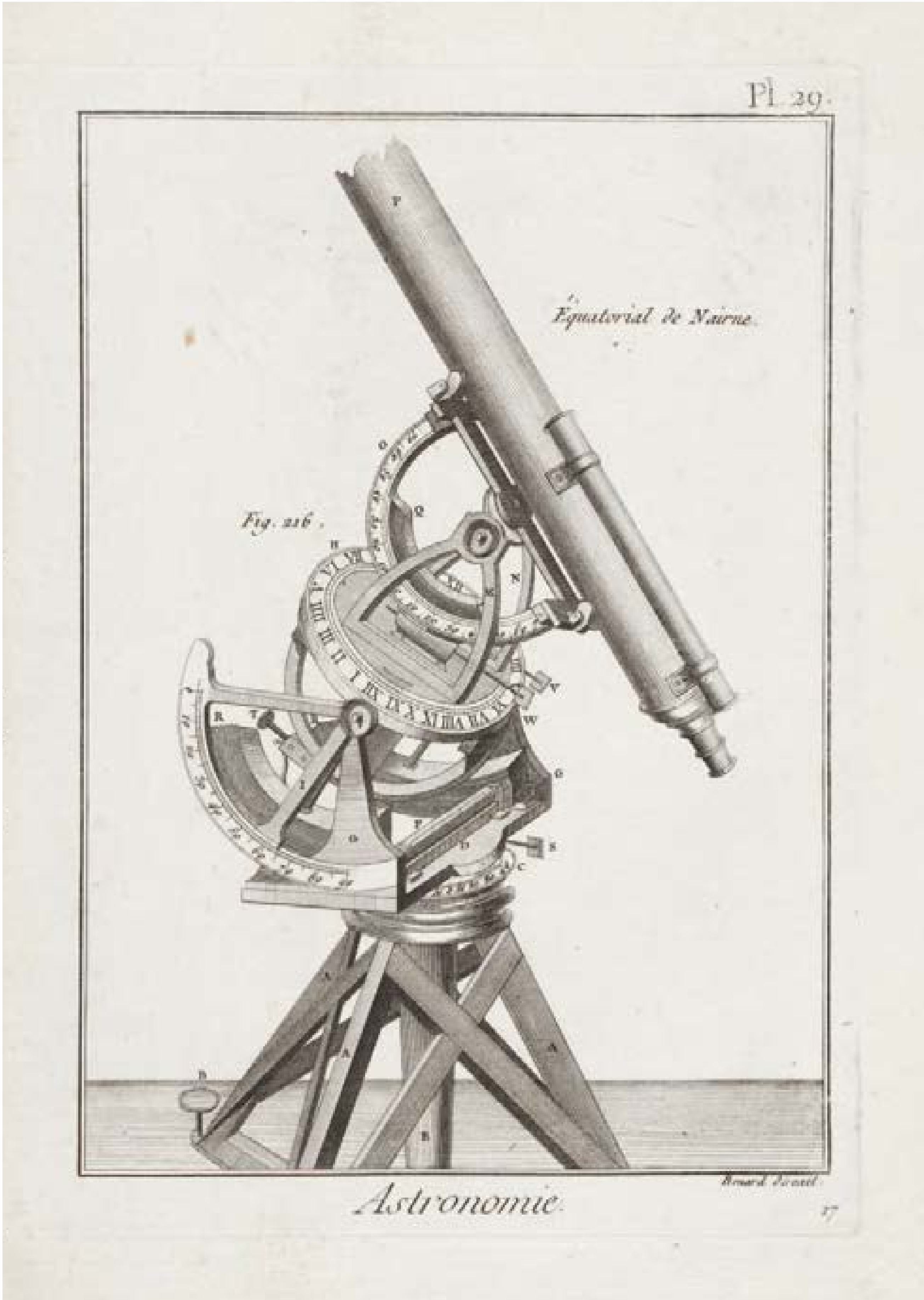
Anatomie. Plate III. Drawing: Defehrt.



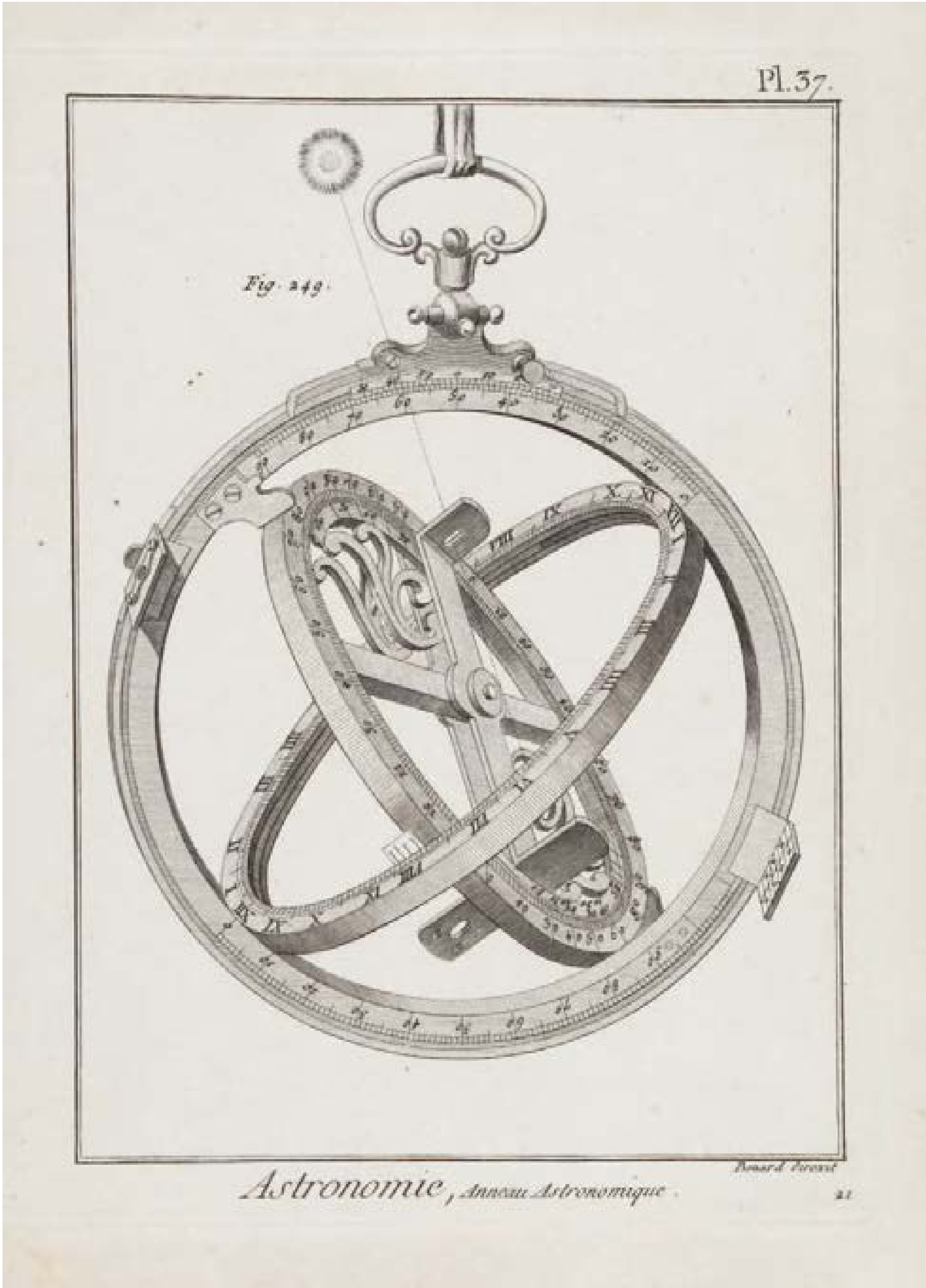
Anatomie. Plate VIII. Drawing: Defehrt

Anatomie. Plate IV. Drawing: Prevost.

Anatomie. Plates XI, XII. Drawing: Defehrt.



Astronomie. Plate 29. Drawing: Defehrt.



Astronomie. Plate 39. Drawing: Defehrt.

Giovanni Battista Piranesi (1720-1778)

Vedute di Roma disegnate e incise da Giambattista Piranesi Architetto Veneziano

ca. 1745

Giovanni Battista Piranesi was a Venetian architect, engraver and erudite, with studies in architecture and perspective. In 1740 he travelled to Rome accompanying the Venetian ambassador, finally settling in the city in 1745, where he learned the engraving technique, aided by his natural skill for drawing. His knowledge of this technique and of architecture, both of ancient buildings and of the works of architects such as Vitruvius or Palladio, plus the demand for images of the city by the travellers of the Grand Tour, led him to create a series of urban and monumental vistas, sometimes real, sometimes invented, greatly in demand from travellers arriving in the city. These etched prints can be considered to be the precedent of travel photography that we see so profusely represented in the ground-floor rooms. Upon his death his son inherited the drawings, plates and other materials, which he took to Paris where he printed numerous engravings, in part funded by Joseph Bonaparte. He later sold his father's oeuvre to the editor Firmin Didot (1764-1836), who printed numerous engravings. They were finally acquired in 1839 by indication of Pope Gregory XVI for the *Calcografia Camerale*, the Intaglio Cameral Office, today the Italian National Institute for Graphic Design. The popularity of these works was so great that they never ceased to be reproduced over the years, and even today we massively find for sale modern prints of their images in numerous Roman establishments.

In his works Piranesi mixes the image of Baroque Rome with buildings from antiquity as well as fantastical imagined architectures in which he played with the scale and the integration of real and invented elements. In 1745 he published *Carceri*, which was re-issued in 1761 as *Le Carceri d'Invenzione*, featuring fantastical invented images using elements from Roman tradition. *Le Antichità Romane* saw the light in 1756. This compilation of 200 prints in four volumes, with views of Roman antiquities, became a souvenir album for travellers who came to the city. Finally, in 1761 he published *Della Magnificenza ed Architettura dei Romani*, a repertoire of real images of ancient Rome exactly as it was at that time, reproduced with a scientific character and interest in showing the reality, as a truthful catalogue of Roman architectural typologies. Some of his images of Rome included the human figure, which as well as showing popular Roman types and Costumbrist scenes, served for escalating the architecture shown on the print.

Vedute di Roma disegnate e incise da Giambattista Piranesi Architetto Veneziano was published between 1748 and 1774, featuring 135 etchings with real views of the city of Rome, both in antiquity and in modernity, to which were added after his death and in later editions the vistas of the interior of the Pantheon and the Coliseum as well as a map of the city.

Veduta del Castello dell'Acqua Felice.

Presso l'autore a Strada Felice nel palazzo Tomati vicino alla Trinità dei Monti.

Friedrich Justin Bertuch (1747-1822)

100 original botanical drawings in watercolour for Bilderburch für Kinder

1790-1822

Friedrich Justin Bertuch was a German editor, writer and Hispanist. From 1775-1784 he held the position of private secretary to the Duke of Saxe-Weimar-Eisenach, who sponsored the Weimar Princely Free Drawing School founded by Bertuch and the painter Georg Melchior Kraus (1737-1806). A member of a family with ties to the arts and sciences, he was educated in theology and law at the University of Jena, although his interest lay in literature and natural history. He learned Spanish and travelled to Spain, and this allowed him to translate *Don Quixote* into German in 1774. His interest in flora led him to found a factory of artificial flowers, which were in great demand at the time throughout Germany. In *100 original botanical drawings in watercolour*, as its name indicates, Bertuch featured 100 watercolour drawings of a variety of plants and flowers, some of them accompanied by their buds or fruits and their sections. All the plants come with their description in Latin, which is again repeated in a manuscript list at the end of the album. This compilation notebook of images formed part of a more ambitious project of Bertuch's, which was to publish a natural history encyclopaedia for children. This publication had a didactic intention, with the visual image prevailing over the text, which was limited to identifying the different plants represented. The plants here compiled are drawn from already-published images as well as copies of natural plants expressly imported for this project and others already growing in Bertuch's own garden.

1. Agaricus integer. Der giflige rothe Faubling.
2. Der giflige Blauling. 3. Der giflige Grunling.
4. 5. Agarirur Torminosus. Der giflige Hirsihling.
6. Aguricur muscarius. Der Fliegenschwam.
7. Agaricur Limentariur. Der Niflblattersihivam.
8. Ag. piperatar. Der Pffefferschivam.

Rudbeckia purpurea.
Die purpur-rolhe Rudbeckia.

Der Riefen-Apfel.

1. Die gemeine Pfirsiche. Amygdalus Perfica.
2. Die Apriscose. Prunus Armeniaca.

Christoph Jacob Trew (1695-1769) & **Georg Dionysis Ehret (1708-1770)**

Plantae Selectae

Nuremberg, 1750-1773

Christoph Jacob Trew was a German physician and botanist, a resident of Nuremberg, a benchmark city in scientific illustration since the 16th century, who published different compilations of plants, books in which he made the botanical selection and the texts that accompanied the plants while the illustrations were made by different authors. As well as of this work, Trew is the author of *Plantae rariores* (1763 to 1784) and *Hortus nitidissimis omnem per annum superbiens floribus* (1750 to 1792), a work which, with 178 hand-coloured engravings, he took 40 years to publish. The drawings featured in *Plantae selectae* are the work of Georg Dionysius Ehret, a German botanist and entomologist, known as one of the best painters of plants and flowers of his time, who made scientific illustrations for numerous books on botany, among them those published by Trew, making him a touchstone in European botany. His earliest engravings were made in collaboration with Carl Linnaeus and George Clifford, with whom he collaborated on *Hortus Cliffortianus* (1738), an edition in which he is the author of nearly 500 drawings of the 1,000 included in it. To this end he moved to London and, during his sojourn there, made, between 1750 and 1771, the illustrations featured in Plantae selectae at the same time as also doing the illustrations for another one of Trew's books, *Plantae rariores* (1763-1784). Lastly, the person who converted Ehret's drawings to engravings was Johann Jacob Haid (1704-1767), an engraver, portraitist and editor of German origin specialising in mezzotint prints and belonging to a dynasty of artists established in Augsburg. *Plantae Selectae*, considered in its time to be one of the best books on botany produced in Germany, contains 100 prints of plants, coloured in gouache, each one of them made up of the plant's drawing with its flower as well as fruit and its dissection. Each image is accompanied by a brief descriptive text in Latin, the first of whose words is highlighted in gilt letters. Added to all of this is a general text on the study of the plants featured in the prints. This work was published in ten instalments, each one of them presenting its own cover, at the start of which is a portrait of the three persons involved in the edition, Trew, Haid and Ehret. Trew died in 1769, with the book's completion still shy of three instalments. It was continued and finished by Benedict Christian Vogel (1745-1825), a professor of botany at the university of Altdorf (Nuremberg).

Magnolia. Nuremberg.

François Levaillant (1753-1824)

Histoire naturelle des perroquets

Paris, Levrault, Schoell et Co., 1801-1805

François Levaillant was a French explorer, collector and ornithologist, though born in Dutch Guiana, where his father was the French consul. He studied natural history at the university of Metz, and after meeting Jean Baptiste Becoeur, a pharmacist and ornithologist and one of the greatest bird collectors of his time, he moved to Paris in 1777 to study ornithology. At this time he discovered the collection of Pierre Jean Claude Mauduyt de La Varenne (1732-1792), a physician and naturalist and also the owner of an important bird collection. One of his first voyages, in 1781, was to South Africa, where he devoted himself to the study of local birds, bringing back with him to Paris nearly 2,000 bird skins. Once back in the French capital he published the results of this sojourn in *Voyage dans l'intérieur de l'Afrique* (1790) and *Second voyage dans l'intérieur de l'Afrique* (1796) and *Histoire naturelle des oiseaux d'Afrique* (1796-1808), which included drawings by Jacques Barraband (1767-1809). These books were very favourably received and brought about Levaillant's recognition as an ornithologist. Thanks to the success of these publications, Levaillant continued his research and publishing, bringing out between 1801-1805 *Histoire naturelle des perroquets*, with prints coloured by hand by Langlois under the direction of Bouquet, according to drawings made by Jacques Barraband in gouache and watercolour. This publication features Levaillant's opposition to the scientific denomination in Latin proposed by Linnaeus, and so he gave French names to all the birds he discovered. He was also in favour of studying birds in their natural habitat, rejecting the analysis of images made by other authors or the classification in laboratories based on dead birds.

L' Ara Macao, Plate 1.

Perruche Ara, Guarouba, Plate 20.

L' Ara gris à Trompe, Plate 11.

L' Ara Macavouanne, Plate 7.

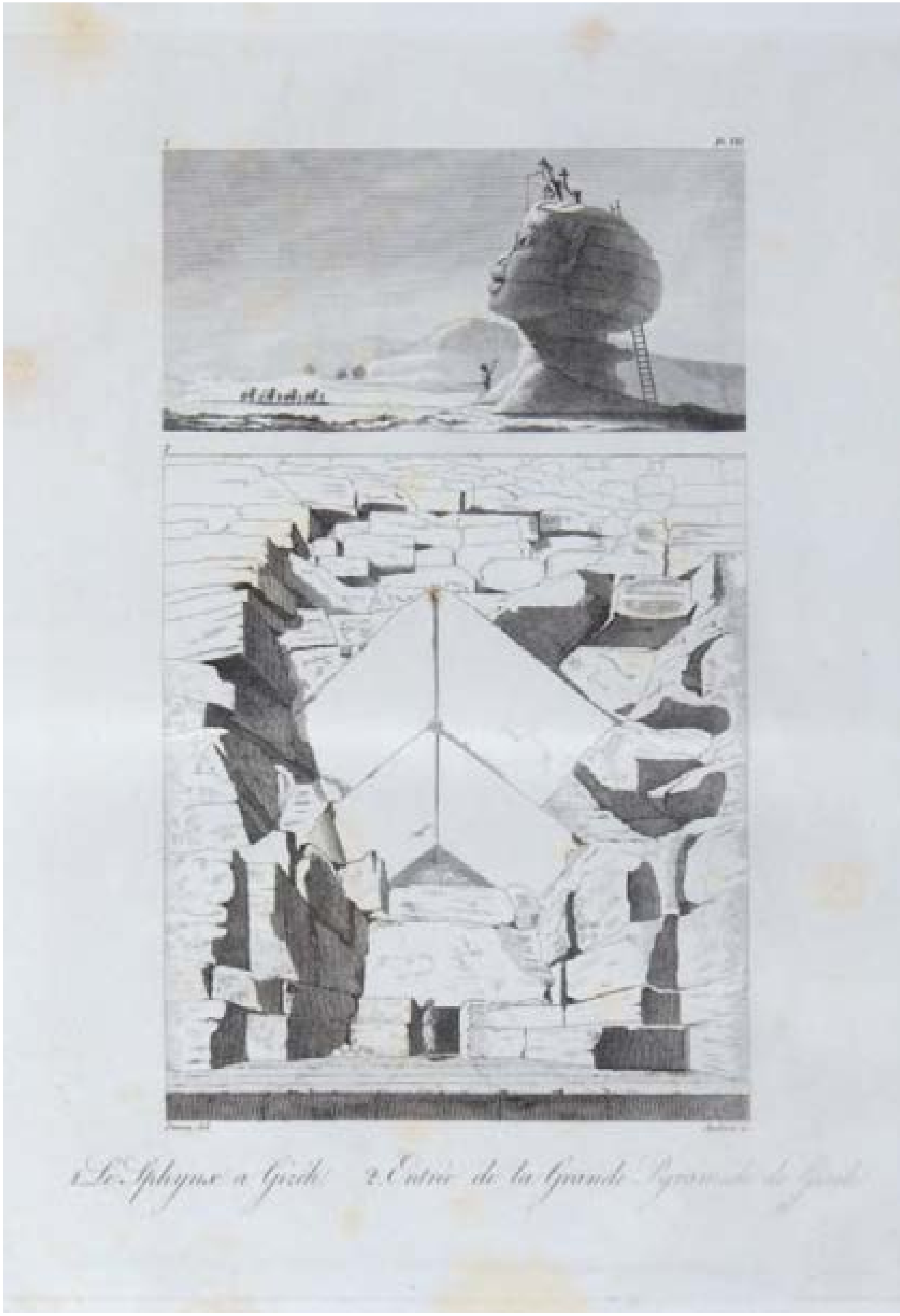
Dominique Vivant-Denon (1747-1825)

Planches du Voyage dans le Basse et le Haute Egypte pendant les campagnes du General Bonaparte

Paris, L'Imprimerie de P. Didot L'Aine, 1802

Dominique Vivant-Denon was a French artist, writer and diplomat who formed part of the group of *savants* who travelled with Napoleon in his campaign to Egypt. He is considered to be one of the fathers of modern Egyptology and museology. After Napoleon's defeat in 1799 he accompanied the emperor on his return to France on board the frigate Muiron, together with other *savants* such as Gaspard Monge or Claude-Louis Berthollet. He was appointed director of the Napoleon Museum created in the palace of the Louvre with the royal collections and the works seized from the nobility, the suppressed Academy and the Church. This museum held all the artworks plundered during Napoleon's campaigns in Europe, most of them returned after his defeat. Under Denon' supervision a catalogue raisonné of the collections was drawn up and the palace was remodelled to adapt it to its new function as a museum. An avid collector, he took advantage of his position to appropriate works of art and other objects in the conquered places, amassing an important collection that was sold after his death. In gratitude for his services to the crown, Napoleon granted him the title of Baron Denon.

While in Egypt he toured the country for eight months together with the French army, which made of him one of the first *savants* to reach Lower Egypt and Nubia and to visit the monuments of antiquity, when he made nearly 40,000 drawings. Upon his return to France he used part of these drawings, after ordering them to be made into prints, together with the notes with his impressions of the country, to publish in 1802 *Voyage dans le Basse et le Haute Égypte pendant les campagnes du General Bonaparte*, a work in two volumes, one with text and the other with engravings, which includes nearly 150 images. Together with the views of the antiquities of the Pharaonic period such as the pyramids and the sphinx, the temples and palaces of Karnak, Luxor, Dendera or Abu Simbel, it also features general views of modern Cairo. Denon's work would later become a reference text for travellers to Egypt and also impacted *The Description of Egypt*, a publication featuring images similar to those published by Denon but in larger numbers.



1. Le Sphinx a Gizeh. 2. Entrée de la Grande Pyramide de Gizeh. Drawing: Denon. Engraving: Audinet.

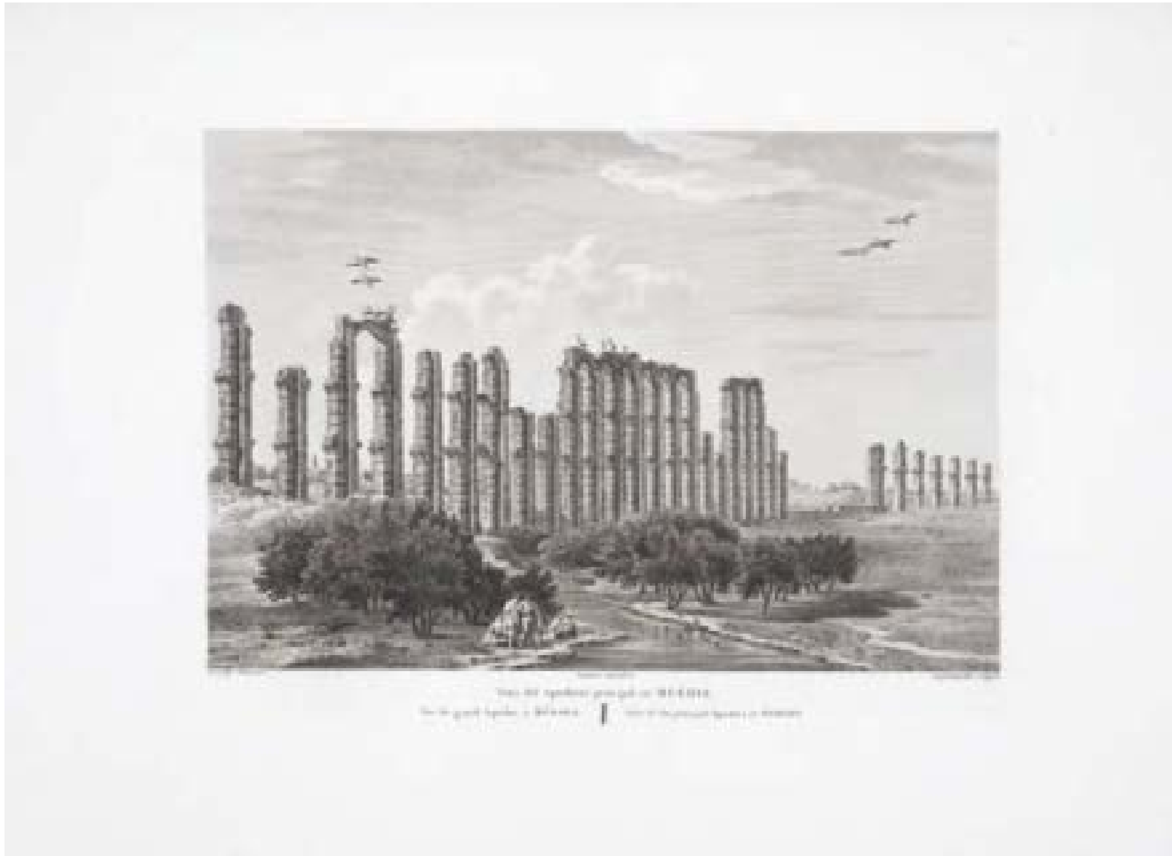
Alexandre de Laborde (1773-1842)

Voyage pittoresque et historique de l'Espagne

Imprimerie de Pierre Didot, l'ainé 1806-1820

Alexandre de Laborde was a French aristocrat, writer, traveller and politician of Spanish origin. His father, who was born in Jaca, had made his fortune in Bayonne. During the French revolution, and owing to his opposition to revolutionary ideas, he was sent by his father to the court of Vienna and made the most of his exile by travelling around Europe. He was amnestied by the government of Talleyrand, after which, and owing to the familial ties he had with Spain, a country where he had already travelled previously, he joined the French embassy entourage of Luciano Bonaparte to Madrid in 1800, returning to France after the treaty of Aranjuez the following year. His knowledge of Spain led to him accompanying Napoleon on his trip to the peninsula in 1808, the same year in which his work *Descriptive Itinerary of Spain* saw the light. Upon his return to Paris he devoted himself to publishing books about Spain. In 1810, and in reward for his services, the Emperor appointed him Count of the Empire. He formed part of the diplomatic mission that asked for the hand of archduchess Marie Louise of Austria, a journey during which he made numerous drawings that later saw the light in the publication *Picturesque Trip to Austria*. After Napoleon's fall he retained his position at the court of the Bourbons.

During his sojourns in Spain Laborde toured the country, taking numerous notes and making drawings of the principal monuments as well as urban and natural landscapes, which served as the basis for the engravings included in his publications. After returning to Paris, Laborde took with him all the materials he had compiled, devoting part of his fortune to publishing *Picturesque and Historical Journey to Spain* between 1806 and 1820, which was later translated into Spanish. This painstakingly created work comprises four volumes that alternate texts with nearly 900 engravings featuring images of Spain, some of which were made by Spanish engravers. Each volume is devoted to a different region. The first one covers Catalonia, the second one Valencia and Extremadura, the third one Andalusia and the fourth one Castile and Aragón. Laborde's work was the first illustrated guide on Spain to be published in France and helped to create the exotic and mysterious image that was generated in the European collective mind about Spain. This edition later served as a reference and influenced the work of other authors, such as the Scotsman David Roberts and even the Spaniard Pérez Villaamil.



Vista del Aqueducto principal en Mérida. Drawing: Dutailly. Engraving: Dequevauviller. Etching: Baugean.

Arco de Triunfo en Caparra. Drawing: Alexandre de Laborde. Engraving: Baltard.

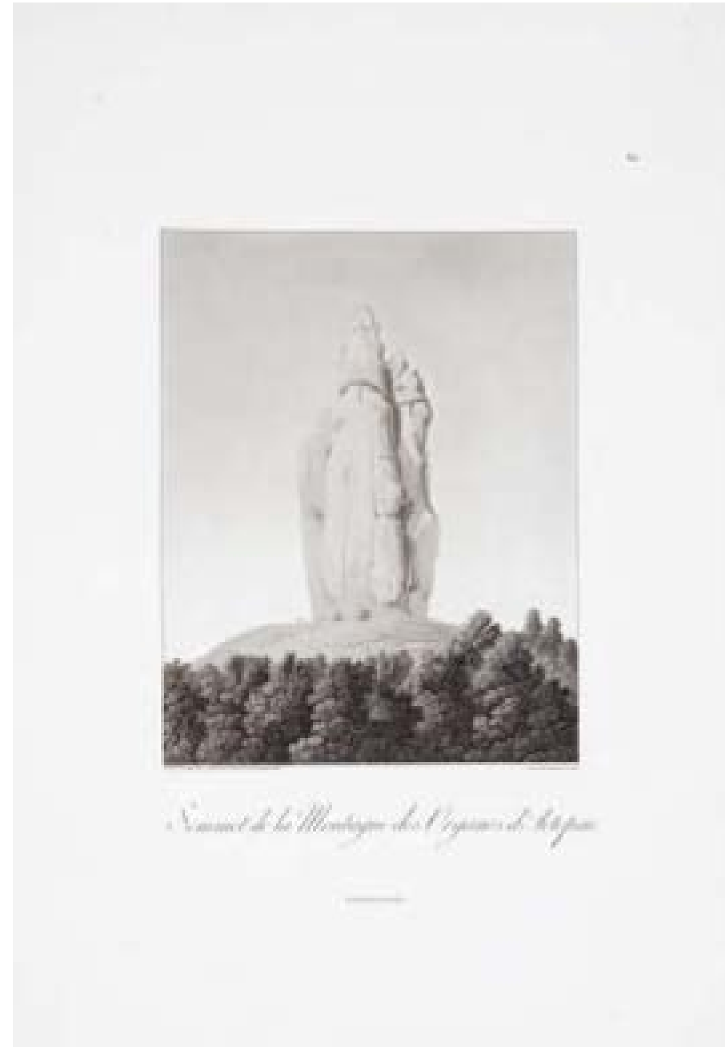
Alexander von Humboldt (1769-1859)

Vues des cordillères et monumens des peuples indigènes de l'Amerique

Paris: chez F. Schoell, 1810

Alexander von Humboldt was a Prussian polymath and a true humanist, geographer, astronomer and explorer. He is considered to be the father of modern geography. As a wealthy man, he was able to fund his exploratory scientific travels around America, both South and North. He also travelled in the Russian territories of Central Asia, commissioned by Tsar Nicholas I. In his expeditions he embarked on numerous fields of research: ethnography, anthropology, physics, zoology, climatology, oceanography, astronomy, geography, geology, mineralogy, botany and vulcanology, the compendium of a truly encyclopaedic mind. Between 1799 and 1804, and as part of the scientific expeditions promoted by the Spanish crown to the Spanish overseas territories, and thanks to the letters of safe passage they gave him in Madrid, one of them issued by the Council of the Indies, Humboldt voyaged to Hispanic America, touring the countries known today as Cuba, Venezuela, Colombia, Peru, Ecuador, Mexico and United States. Between 1804 and 1827 he settled in Paris, where he busied himself arranging and editing the materials he had collected on his expeditions and publishing various papers. Among the most important was the one on his exploratory travel around Hispanic America. *View of the Cordilleras and Monuments of the Indigenous Peoples of the Americas* was published in 1810, constituting, as with *The Description of Egypt*, contemporaneous to this work, a veritable novelty as for the first time the images included in the work made reference to and illustrated the explanations featured in the text. The edition takes the form of two volumes containing 69 engravings each one, both in black and white and in colour, for they are based on the drawings made by the author during the trip. These plates show urban and natural vistas, geographic features, flora, wildlife and antiquities of the territories he covered. Humboldt's objective, both in the expedition and in its publication, was to deepen the knowledge of pre-Columbian cultures, especially of Mexico and Peru, from an anthropological viewpoint and that of their relationship with the territory in which they developed, all of it from a scientific perspective. In this way, through both the texts and the engravings, Humboldt transmitted to Europe his perception of the pre-Hispanic cultures, of the other, of other realities, to some extent generating the image which the western world created for itself of these cultures, just like *The Description of Egypt* was to do in the same era with the Egyptian world, or the photographers would do when describing those they encountered in the new territories as "the others, the different ones, the curiosities, the exotics". This construction of images through photography was to affect the perception of the others both in the East and in Spain.

Buste d'une Prêtresse Aztéque. Dessiné à l'Académie de Peinture de Mexico d'après l'Original en basulto qui se trouve au Cabinet de Mr. Dupé. Gravé à Paris, par Massard l'aîné. De l'Imprimerie de Langlois.



Sommet de la Montagne des Organos d'Actopan, dessiné par Marchais d'après un croquis de M. de Humboldt. Gravé par Bouquet. De l'Imprimerie de Langlois.

Le Chimborazo vu despuis le Plateau de Tapia. Dessiné per Thibaut d'après une esquisse de Mr. de Humboldt. Gravé par Bouquet. De l'Imprimerie de Langlois.

Robert Dowson Rylar

Figures of Plants Belonging to the Different Genera

1814

Robert Dowson Rylar was an English amateur botanist who in a notebook drew, in the manner of a travelogue, different images of plants taken from the publications of other authors: from *The Botanical Magazine or Flower-Garden Displayed*, published between 1787 and 1801 by William Curtis (1746-99), from *English Botany* by James Sowerby (1757-1822), and from *The Gardener's and Botanist's Dictionary*, the work of Thomas Martyn (1735-1825) and Philip Miller (1691-1771). This notebook in a quarto format contains 143 drawings of plants, generally with their flower, made by hand and in colour with pencil, pen, ink and watercolour. Each plant is numbered and accompanied by a manuscript text descriptive of the plant's characteristics. Drawings, watercolours and engravings of plants were common in Europe throughout the Modern Era, particularly during the 18th century, when botany studies were developed and Carl Linnaeus (1707-1778) established the classification system for living beings. Equally, in line with the spirit of the Enlightenment and the scientific expeditions undertaken in the seventeen-hundreds, the compilation of exotic plants was made through drawings and engravings that precisely and exactly reflected the reality of the analysed plant. On numerous occasions throughout the 18th and 19th centuries we encounter authors of plant compilations who did no field work but instead copied drawings published in previous compilations and included them in their own repertoire. Given their quality and accuracy, today many of these drawings continue to be used as working materials in botanical studies and research.

Aloe Retusa, Gushion Aloe.

Passiflora Garulea, Common Passion Floivere.

Aloe Saponaria var a minor.

Passiflora Serratifolia, Notchtiaverd Pasion Flower.

Theodor Friedrich Ludwig Nees von Esenbeck (1787-1837)

Plantae officinalis, oder Sammlung officineller Pflanzen

1821-1828

Nees von Esenbeck was a German botanist and pharmacist, the brother of naturalist Christian Gottfried Daniel Nees von Esenbeck (1776-1858). He received his early learning in Erlangen, Bavaria, and in 1811 he moved to Basel, where he worked as a pharmacist. Later, in 1817, he went to Leiden as a reader of botany at the university while also holding a position of inspector of its botanic garden. In 1818 he went to work at the botanic garden of Bonn, of which he eventually became director, and in 1827 he started to work as a professor in the town's university. Combining his knowledge of botany and pharmacy, Esenbeck investigated the medicinal properties of plants, leading him to found in 1834, jointly with other naturalists, a botanic organisation devoted to researching the flora of the Rhineland. Among his best-known works are *Plantae officinalis, oder Sammlung officineller Pflanzen*, which comprises nearly 440 colour lithographs of different plants produced by M. F. Weihe, J. W. Wolter and P.M. Funke. They are grouped loosely into 17 folders and presented as a catalogue of medicinal plants. This work was also published in book format consisting of three volumes, the first one of text and the others of images, to which in 1833 a supplement was added containing a further 120 lithographs. The images are presented as a general view of each plant and, for those that have them, its fruit with its cross-section, with the name of the plant added in manuscript Latin in black ink.

Iris Germanica.

Papaver Officinale Gm.

Léon de Laborde (1807-1869) & **Louis Maurice de Linant (1799-1883)**

Voyage de l'Arabie Pétrée par Léon de Laborde et Linant

Paris, Giard, 1830

Simon Joseph Léon de Laborde was a French archaeologist and diplomat, the son of Alexandre de Laborde, author of *Picturesque Journey to Spain*, which is also displayed in the room. From his father he inherited his interest in other cultures, leading him to embark on different voyages around Asia Minor, Syria and Egypt. In 1847 he was appointed conservator of antiques of the Louvre Museum and ten years later director-general of Archives of the Empire.

In 1828 Léon de Laborde embarked on an expedition to Petra together with Louis Maurice Linant de Bellefonds, also known as Linant Pasha. Linant, a French engineer and explorer, arrived in Egypt as part of a French expedition along the eastern coastline of the Mediterranean in which initially he took part as a sailor, but after the death of one of the artists, he went on to replace him thanks to his drawing skills. When the expedition ended he settled in Egypt, where he entered the service of Muhammad Ali (1769-1849), the country's viceroy by delegation of the Ottoman sultans and considered to be the founder of modern Egypt. Between 1818 and 1830 he devoted himself to exploring Egypt and attached territories, including a failed trip to Petra, after which, from 1831 to 1869, he was appointed chief engineer of public works in Egypt. In this position he exercised his influence in the construction of the Suez Canal already propounded by Laborde during their expedition to Petra, becoming one of the founders of the Suez Canal Company.

The goal of the expedition undertaken by Laborde and Linant was Petra, made known in 1814 by the Swiss orientalist Johann Ludwig Burckhardt in his book *Travels in Syria and the Holy Land*. Laborde and Linant departed from Cairo in February 1828, arriving in Petra in March of the same year. During the trip, when they also visited Mount Sinai, they made different drawings, later published by Laborde in his book *Journey through Arabia Petraea*, which constituted a veritable novelty, for it was the first time that Europe saw vistas of Petra, which received practically no further attention until ten years later David Roberts, after his travels to Egypt and the Holy Land, again published images of its monuments, albums which are on display in this room. The Laborde and Linant expedition was one of the few not focused on the route followed by Napoleon, instead going beyond to unexplored territories.

Vue du Khasné, dans son état actuel.
Drawing: Léon de Laborde. Lithography: Engelmann and Deroy.

Tombeau avec une inscription grecque (Petra).
Drawing: Léon de Laborde. Lithography: Villeneuve and Engelmann.

Tombeau corinthien (Petra). Drawing: Léon de Laborde. Lithography: Engelmann and Clapuy.

Edward King, Viscount Kingsborough (1795-1837)

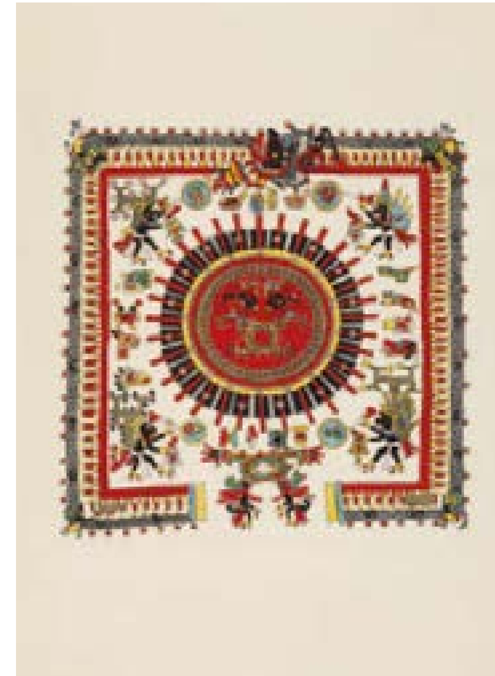
Antiquities of Mexico: comprising facsimiles of ancient Mexican paintings and hieroglyphics, preserved in the royal libraries of Paris, Berlin and Dresden, in the Imperial library of Vienna, in the Vatican library; in the Borgian museum at Rome; in the library of the Institute at Bologna; and in the Bodleian library at Oxford. Together with the Monuments of New Spain, by M. Dupaix: with their respective scales of measurement and accompanying descriptions. The whole illustrated by many valuable inedited manuscripts, by Augustine Aglio.

1831

Edward King, Viscount Kingsborough, was an Irish nobleman who in his student years at Oxford became obsessed with Mesoamerican pre-Columbian codices, leading him to the study of these manuscripts: Mayan, Mixtec and Aztec codices, the descriptions and historical accounts that explorers had made of archaeological ruins as well as other Central American objects and antiquities. Unlike what we see by most authors of the albums displayed in this room, Lord Kingsborough never travelled to Central America but instead commissioned the Italian painter and engraver Agostino Aglio (1777-1857) to compile different materials extant in European collections. In this project he had the help of Sir Thomas Phillips, who was himself the owner of an important collection of manuscripts, parts of whose images were included in Kingsborough's work. In fulfilling his commission, Aglio visited various libraries where, having once seen the manuscripts they contained, he would draw from life the illustrations that interested him to then reproduce them as lithographs. Together with the Phillips collection, *Mexican Antiquities* features images of Mexican manuscripts conserved in various European libraries: the Bodleian in Oxford, the Vatican library, that of the Bologna Institute, royal libraries of Berlin, Dresden and Budapest, Imperial library of Vienna, Borghese Gallery of Rome and various private collections. It also included images published in the *General History of the Things of New Spain* by Sahagún and the chronicles of Tezozomoc and Ixtlilxochitl. Among the materials published, Kingsborough included part of the drawings and texts gathered by Guillermo Dupaix, the first ones in volume IV and the second ones in VI. *Antiquities of Mexico* was published with texts in four languages: Spanish, English, French and Italian, and consists of 9 volumes in elephantine folio, the first 4 of images that include nearly 750 engravings and the rest containing text. The project's magnitude and high cost ruined Kingsborough and caused him health problems that led to his death.

Untitled. Vol. II. Drawing: Augustine Aglio.

Untitled. Vol. II. Drawing: Augustine Aglio.



Untitled. Vol. III. Drawing: Augustine Aglio.

Untitled. Vol. IV. No. 1. Drawing: Augustine Aglio.

Guillermo Dupaix (1746-1818)

Antiquités Mexicaines. Relation des trois expéditions du capitaine Dupaix, ordonnés en 1805, 1806 et 1807 pour la recherche des antiquités du pays notamment celles de Mitla et de Palenque

Paris, Jean-Henri Baradère, 1834

Guillermo Dupaix was a soldier and antiquarian at the service of the king of Spain. Born in the Grand Duchy of Luxembourg, his military career was undertaken in the Spanish army, where he attained the rank of Captain of Dragoons. In 1794 he conducted an inventory of monuments and antiquities of Mexico and from 1805 to 1809 he directed the *Royal Antiquarian Expedition in New Spain*, which was cut short by the French invasion of Spain. This project formed part of the scientific expeditions to America promoted by the Spanish crown from Philip V onwards and which reached their apex under the reign of Charles III, who in his time as king of Naples and Sicily had promoted the excavations of Pompeii and Herculaneum. These expeditions to Spanish overseas territories also formed part of the scientific expeditions that were scouring the globe and which, from France, were more oriented to the eastern Mediterranean, Africa and Asia Minor. These expeditions led to a renewed interest in pre-Columbian cultures, both for their history and for their antiquities, also driven by the recently created Academy of History, which incentivised the different institutions based in the Spanish viceroyalties to collect and study antiquities, as was being done in the rest of the territories under the Hispanic crown. It was Charles IV who promoted the expedition, obeying his desire to investigate the ruins and antiquities of pre-Columbian America. The man who accompanied Dupaix as draughtsman was the Mexican José Luciano Castañeda (1774-1834), born in Toluca and educated at the San Carlos Royal Academy of Mexico. Between 1805 and 1807 the expedition travelled to, among other places, Cholula, Mitla, Monte Albán and Palenque, taking and collecting images of temples, sculptures, archaeological items and glyphs carved from stone. Owing to Spain's War of Independence, the results of the expedition did not see the light until 1831, when part of the material was published in London as part of the work by Lord Kingsborough, *Antiquities of Mexico*, which is displayed in the room together with the album we study here. Castañeda's drawings, engraved by Agostino Aglio (1777-1857), were included in volume IV, and Dupaix's texts in VI. Finally, the result of Dupaix's expedition was published in France in 1834 with the title of *Antiquités Mexicaines. Relation des trois expéditions du capitaine Dupaix, ordonnés en 1805, 1806 et 1807 pour la recherche des antiquités du pays notamment celles de Mitla et de Palenque*, for which Castañeda's drawings were touched up.

1.re Expédition. Antiquités Mexicaines. Plate X. Untitled.
Drawing: H. Robillard, after the original drawing by Casteñada.
Lithography: Engelmann.

1.re Expédition. Antiquités Mexicaines.
Drawing: M. D. after the original drawing by Castañeda.
Lithography: Engelmann.

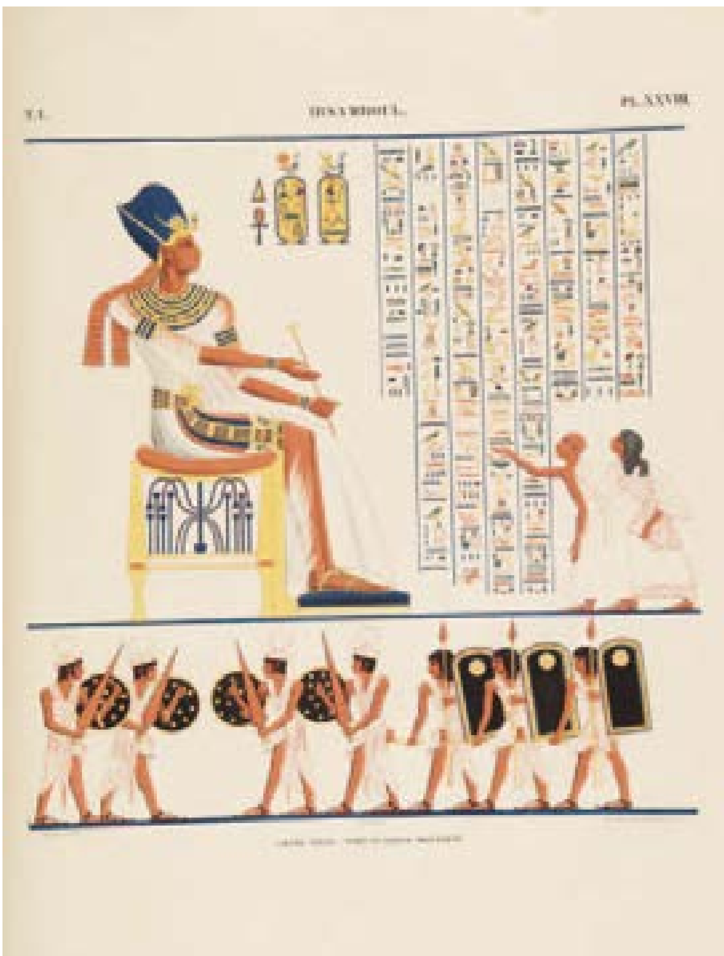
Jean François Champollion (1790-1832)

Monuments de l'Égypte et de la Nubie, d'après les dessins exécutés sur les lieux sous la Direction de Champollion-le-Jeune, et les descriptions autographes qu'il en a rédigées. Publiés sous les Auspices de M. Guizot et de M. Thiers

Paris, Imprimerie et Librairie de Firmin Didot Frères, 1835–1845

Jean-François Champollion was a French Egyptologist specialising in oriental languages. In the course of his career he was a professor at the University of Grenoble; he then travelled in Italy on the orders of Charles X in search of Egyptian antiques in private collections and, finally, was appointed conservator of the Egyptian Art department of the Louvre Museum. In 1828 he was commissioned to lead the French archaeological mission to Egypt and Nubia and upon his return in 1831 was awarded a chair at the Collège de France. He is considered to be the father of Egyptology in honour of the fact that, in 1822, he succeeded in deciphering the language of the Egyptian hieroglyphs for the first time since the disappearance of the world of the pharaohs. He made the transcription of the Egyptian alphabet thanks to the texts compiled by the *savants* who accompanied Napoleon on his Egyptian campaign, most of them published in *The Description of Egypt* and, above all, thanks to the Rosetta Stone, a black basalt stele from the Ptolemaic era that contained the same text in three languages, hieroglyphs, Demotic script and ancient Greek script, a stone seized by the English after the French capitulation of Alexandria in 1801. For his investigation Champollion used a copy of the triple image engraved in this stone and published in the *Description*, engravings which we can see in room 2 of this same floor.

From 1828-1830 Champollion directed the French archaeological mission to Egypt and Nubia, accompanied by the Italian scholar Ippolito Rosellini, during which time they devoted themselves to copying the hieroglyphs and mural paintings that covered the temples and palaces of the pharaonic era. These images, together with the mission's logbook and other texts written by Champollion on the language of the Egyptian hieroglyphs and antiques, were published upon his death by his older brother in the work we are here presenting, which is deemed to be his most important publication. *Monuments de l'Égypte et de la Nubie, d'après les dessins exécutés sur les lieux sous la Direction de Champollion-le-Jeune, et les descriptions autographes qu'il en a rédigées*, edited in 4 volumes, was published in instalments, in large atlas format folio. Editing the materials did not keep pace, for between 1835 and 1844 only plates with engravings were published, whereas the explanatory texts of these images, denominated descriptive entries and taken from Champollion's diary, saw the light from 1844 onwards. Although the index included in the first of the volumes indicates that the edition contains 511 plates of engravings, none of the known copies retains so many images, with their number oscillating between 495 and 505.



Grand Spéos. Suite du Tableau précédent. Ibsamboul. Volume I. Plate XXVIII.
Lithography: H. Roux elder. Drawing: S. Cherubini del.
Chromolithography: J. Engelmann.

Peintures copiées dans les tombes de Névôthph et de Ménothph.
Béni - Hassan - el - Qadim. Volume IV. Plate CCCLH. H.
Lithography: Roux elder. Chromolithography: J. Engelmann. Cité Bergére.

James Bateman (1811-1897)

The Orchidaceae of Mexico and Guatemala

London, Ridgway, 1837-1843

James Bateman, a native of Lancashire, England, was educated at Lincoln College, Oxford, and later at Magdalen College, where he developed his interest in tropical plants. He served as president of the North Staffordshire Field Society and, in 1838, he was accepted as a member of the Royal Horticultural Society, serving on its botanical exploration committee. He is considered as one of the most important figures in 19th century horticulture. Thanks to his economic position, he was able to commission the search for orchids in Mexico and Guatemala, so that, contrary to most of the authors of the albums, except Lord Kingsborough, he did not need to travel to either country. However, with the help of the painter Edward William Cooke, a specialist in marine landscapes, he collected specimens of these flowers and planted them at his homes in Staffordshire, first at Biddulph Grange and, from 1840 onwards, at Knypersley Hall, where he planted one of England's most important gardens, in whose greenhouses he cultivated different types of orchids. He was also the author of the layout of the Derby *Arboretum* garden, considered the first public park in England. Due to his interest in orchids, he sponsored successive exploration campaigns to Mexico and South America in search of new species of orchids, some of which he later planted in his garden.

The Orchidaceae of Mexico and Guatemala was considered in its time as one of the most beautiful books ever published, becoming the most sought-after edition on this subject. A limited print run, only 125 copies, was made, dedicated to Queen Adelaide of Great Britain, containing 40 sheets in elephantine folio format, drawn by British illustrators Sarah Ann Drake (1803-1857) and Augusta Innes Withers (1792-1877), while the author of the lithographs was Maxim Gauci (1774-1854), an engraver of Maltese origin living in London. Withers, a painter and illustrator of natural history, obtained the position of Painter of Flowers to Queen Adelaide and of Flowers and Fruits to Queen Victoria. She participated with her work in exhibitions at the Royal Academy and the British Society of Artists, being a founding member of the Society of Female Artists. She was the author of 23 of the 40 orchid drawings published in this album. Drake was a botanical illustrator who trained in drawing in Paris and who as a child was a member of the circle of botanist and orchidologist John Lindley (1799- 1865), with whom she collaborated in the illustration of his publications, naming one of Lindley's orchids as *Drakaea* in her honor. For Bateman's work, Drake made 16 of the 40 drawings used.

Barkeria Spectabilis. Plate 33. Drawing: Mifs Drake. Lithography: M. Gauci.

Genaro Pérez Villaamil (1807-1854)

La España Artística y Monumental

Paris, Alberto Hauser, 1842, 1844, 1850

Genaro Pérez Villaamil was a Spanish painter specialising in capturing landscapes, urban and monumental vistas. He was educated at Madrid's Real Academia de Bellas Artes de San Fernando. Of liberal ideas, he lived in exile in France and Belgium during the Espartero regency between 1840 and 1844, travelling around Europe during this time. Upon his return to Spain he gained the first Landscape Chair at the Royal Academy. He eventually became a Full Academician and occupied the honorary position of chamber painter to queen Isabella II. He was among the major Spanish landscape painters to be greatly influenced by the work of David Roberts, focusing his gaze on landscapes, urban vistas and Spanish monuments, in line with the theories of the picturesque and the sublime, with a Costumbrist approach that extols local values.

His best-known work are the three volumes of *Artistic and Monumental Spain*, a project sponsored by the Marquis of Remisa, which he authored in collaboration with Patricio de la Escosura, who wrote the texts. Villaamil, as well as directing and supervising the work, made most of the drawings, on numerous occasions based on his own pictorial oeuvre, although other painters also collaborated, like his brother Juan or Valeriano Domínguez Bécquer. The works were then transferred to lithographs by the Paris-based house Hauser & Menet, a task which employed 24 lithographers.

This work forms part of the current of compilations of a country's vistas of urban settings, monuments and ruins that became commonplace from the mid-18th century onwards, as we can see in numerous examples in this exhibition. These types of works opened up to the western public the knowledge of distant countries and built the image of the other. Villaamil's oeuvre, more advanced in time, was already part of the dominant romantic current in Europe and distanced itself from the scientific capturing of reality that we saw in previous works, for in many drawings he allowed himself romantic licences by modifying the veracity of what he was representing. In most works there is an exaltation of the medieval, for after Napoleon' defeat the value of each country's vernacular had been exalted as the primeval image as yet uncorrupted by civilisation. In line with this current, in many of these images we see the human figure, the popular type who, as well as escalating the architecture, was to build the image of Spanishness that spread around Europe, just like photography was doing at the same time and which has endured practically until the present day. *Artistic and Monumental Spain* directed its gaze to the two Castiles, Andalusia, the Basque Country, Navarre and Galicia, in a selection that does not aim to be exhaustive and in which the representation of several Spanish regions is absent.

Interior de la Capilla de S. Isidro en la parroquia de S. Andrés en Madrid - Intérieur de la Chapelle de St. Isidro dans la Paroisse de St. André, a Madrid. Drawing: G.P. Villaamil. Engraving: Asselineau and Bayot. First Volume. In Paris, at Alberto Hauser's. Printed by Lemercier Bernard et Ce.

David Roberts (1796-1864)

The Holy Land, Syria, Idumea, Arabia, Egypt & Nubia

Londres, F. G. Moon, 1842-1849

David Roberts was a partly self-taught Scottish draughtsman and landscape painter who trained as a painter of interiors and later as a stage designer. In England, where the War of Independence was still generating heroic visions, he came into contact with the numerous colony of Spaniards in exile from the absolutism of Ferdinand VII and who conveyed to him an idealised narrative of the country. Moved by the prevailing romantic vision in Europe and by the aesthetic principles of picturesqueism, he went on different travels, first around Europe and later Spain, North Africa and the eastern basin of the Mediterranean. In 1833 he was in Spain, where he met Genaro Pérez Villaamil and influenced his work, and in 1842 visited for the first time Egypt, Nubia and the Holy Land. Roberts was the first artist to travel without the support of any institution or private individual or ties to a military or scientific expedition. He did so moved only by the interest awakened in him by all those scenarios. In his work he used low viewpoints to highlight the dimensions in perspective of the building he was picturing, and liked to place human figures in them to escalate the architecture. He altered his compositions and recreated different elements to emphasise their romantic and picturesque vision.

His early works feature picturesque vistas of Scotland, with a clear interest in historic ruins of castles and abbeys, vistas which served as the basis for more exotic images after his travels in Spain, Tunisia and northern Morocco. In Spain, though attracted by the landscape, the medieval constructions and the character of its peoples, what he perceived as novel was the country's Arabic past in cities like Córdoba, Granada and Seville. These images led him to embark in 1838 on a long journey around Egypt, Nubia, the Holy Land, Jordan and Lebanon, where he made numerous drawings and sketches in unknown expanses that, back in London, were the basis for the creation of new works, lithographs as well as oils and watercolours. In Europe they were widely in demand thanks to the widespread romantic spirit of the time and to the interest in the entire eastern Mediterranean after Napoleon's campaigns. The material collected on his trip led to the publication of the two works presented here, *The Holy Land,* between 1842 and 1849, and *Egypt and Nubia,* between 1846 and 1849, both of them published in three volumes that alternate text with images and contain nearly 250 lithographs, all of them in colour and produced by Louis Haghe, one of the great lithographers of the era. Many of the landscapes, vistas and ruins reproduced by Roberts were replicated in the photographs taken by photographers working in the eastern Mediterranean that we see in the ground-floor rooms.

Temple of Abu Simbel, Nubia. Vol. III. Drawing: David Roberts. Engraving: R. A. L. Haghe.

Great Hall at Karnak, Thebes. Vol. III. Drawing: David Roberts.
Engraving: R. A. L. Haghe.

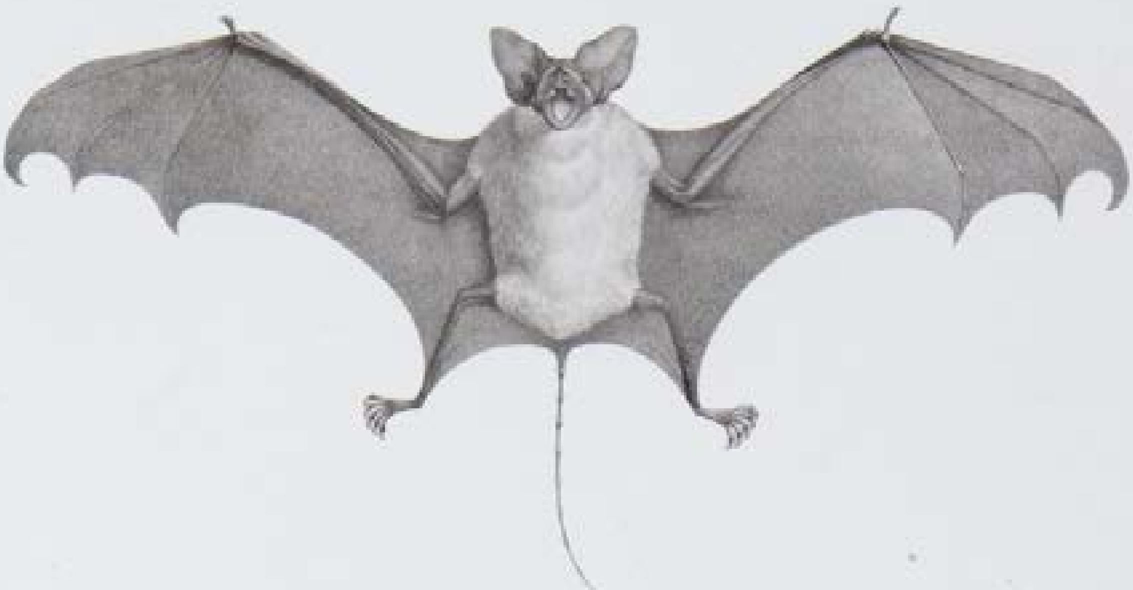
Tombs of the Khalifa, Cairo. Vol. I. Drawing: David Roberts.
Engraving: R. A. L. Haghe

Entrance to Petra. Vol. I.
Drawing: David Roberts. Engraving: R. A. L. Haghe.

Convent of St. Catherine with Mount Horeb. Vol. I.
Drawing: David Roberts. Engraving: R. A. L. Haghe.

Convents of St. Saba. Vol. II.
Drawing: David Roberts.
Engraving: R. A. L. Haghe.

1



2

3

DESCRIPTION DE L'ÉGYPTE

ou Recueil des observations et des recherches qui ont été faites en Égypte pendant l'expédition de l'Armée française, publié par les ordres de Sa Majesté l'Empereur Napoléon le Grand.
(1809-1823)

Back cover. Drawing: Cécile. Engraving: Girardet and Sellier, Plates. Antiquities I. Volume I.

The publication of this work cannot be disassociated from the scientific expeditions undertaken during the 18th century. In the context of war between France and England, France set its sights on Egypt, which at that time belonged to the Ottoman Empire but was governed with a degree of independence by the Mamelukes. In parallel to propounding the country's invasion, an Arts and Sciences Commission was established that made sure to include in the military expedition a group of scientists with the mission of gathering knowledge on Egypt from the era of the pharaohs to the time of the expedition. Under the command of General Louis Marie Caffarelli du Falga (1756-1799) and the mathematician Gaspard Monge (1746-1818), a hundred and sixty-seven learned men, the *savants*, and nearly two thousand artists, among them engineers, scientists, architects, mathematicians, botanists, painters, engravers and other experts, travelled to Egypt and over a four-year period ranging from 1798 to 1801 scientifically and systematically collected data on the country. After their arrival in Cairo, the *savants* set up house in the city's palaces and founded the Egypt Institute, which centralised the data collection tasks. After Napoleon's defeat, and with the English seizing the collected artworks, the *savants* were able to return to France with a good part of the drawings and documentation they had generated, which is why in 1802 the state decided to publish them. To this end it formed the Egypt Commission consisting of the chemist Claude Louis Berthollet (1748-1822), the painter Nicolas-Jacques Conté (1755-1805), the engineer Michel Ange Lancret (1774-1807), the scientist Louis Costaz (1767-1842), the mathematician and physicist Joseph Fourier (1768-1830), the physician René-Nicolas Dufriche Desgenettes (1762-1837), the mathematician and engineer Pierre-Simon Girard (1765-1836) and the mathematician Gaspard Monge (1746-1818). Successively heading this commission were Conté, Lancret and the cartographer, engineer and archaeologist Edme-François Jomard (1777-1862). It was actually Conté, the inventor of, among other things, the modern pencil and a machine for optimising the execution time of an engraving, who was in charge of supervising the plates, with the clever idea of reproducing on paper all the monuments on the same scale so that the reader would have a precise idea of the giant size and scale of certain architectures, always applying a scientifically objective approach.

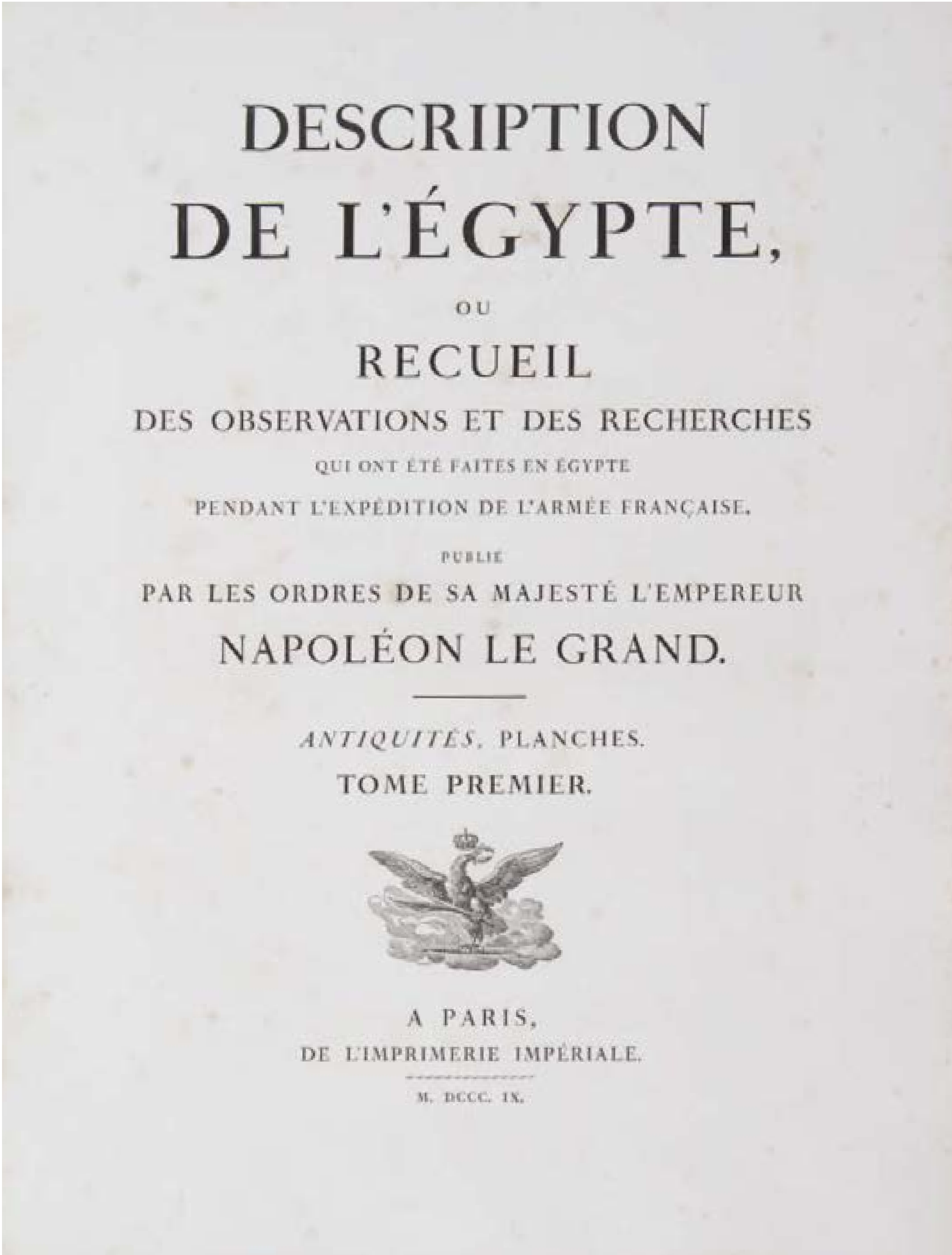
The Description of Egypt consists of twenty-three volumes, nine of text, one of indexes and thirteen of plates, eleven in elephantine folio and two in double elephantine folio or *Grand-Égypte*, denominated *Mammouth*. By themes, five of the elephantine volumes and the two *Mammouths* feature the engravings of Antiquity, three of them Natural History, two the Modern Age and one topographic maps. The first of the volumes, the one on Antiquity, was published in 1809, and the last one, on topographic maps, in 1823. The publication of the volumes is not correlated by theme; instead they were published as and when the material was compiled on one of the themes. The project was so important that, after the fall of Napoleon, Louis XVIII continued to publish *La Description*, only replacing the mention of the edition and the coat of arms. Napoleon, the eagle and the imperial printer were replaced by the Government, the fleur-de-lys of the Bourbons and the royal printing house.

The five volumes with the Ancient History illustrations were published between 1809 and 1822, the first volume in 1809, the second and third one in 1812, the fourth in 1817 and the fifth in 1822, all of them in elephantine folio as well as the two volumes in *Mammouth* folio, which are undated. Three of them were published under the reign of Napoleon and another two after the return of the Bourbons. These volumes of images accompanied and illustrated four volumes of text published in 1809 and 1818. This compilation of images of intaglio engravings and etchings are based on drawings made by the *savants* in situ in Egypt and later converted to engravings in Paris. All the images were made according to a scientific methodology, not only in recreating the reality and authenticity of the iconography represented but also through their cataloguing, following the model provided by the *Encyclopaedia* of Diderot and d'Alembert, marking in the actual work the volume containing the image, the location of what is represented and its identification as well as the authorship of the draughtsman and the engraver. Despite this some of the prints did not escape the subjectiveness of the engravers, who freely recreated landscapes, buildings and scenes according to the pervasive orientalist taste of the time. The images featured in these volumes are general vistas and landscapes of ruins of ancient Egypt, monumental views of temples, tombs, palaces and other constructions of the Pharaonic period, showing plants, elevations and sections, often indicating the measurements both through the introduction of scales and in the placing of groups of human figures in order to scale the accompanying architectures and thus enable an understanding of the magnitude of Egyptian architecture. Together with the architectural and sculptural images, the plates on Antiquity also show sculptures, hieroglyphs and mummies, both human and animal, as well as any element from the point of view of art and science that reflects the capturing of human artistic concerns in the time of the pharaohs. Special attention is paid to the representation of reliefs and hieroglyphs that cover the walls of Egyptian constructions as well as the reproduction of papyri contents. In regard to this, one of the major discoveries of the French expedition was the Rosetta stone, seized by the English after the French surrender in Alexandria in 1801. This ancient Egyptian stele contained the same inscription in three different languages: hieroglyphs, demotic script and ancient Greek. Aware of the importance of this find, *La Description* features in three *Mammouth*-size engravings each one of the inscriptions, including in one of them, following the scientific rigour that dominates the work, the complete representation of the stone for its proper comprehension. It was these images that enabled Champollion in 1822 to transcribe the language of the hieroglyphs, for the first time after the disappearance of the world of the pharaohs. However, in some of these engravings the representation of hieroglyphs and reliefs presents errors owing to the incorrect transcription made by draughtsmen or engravers of some of them, either for being illegible or for erroneously interpreting their strokes. Also featured are images of mummies of both humans and animals, presenting both the overall vision and their dissection. The scientific interest in showing the representations in the most real manner possible and in providing complete comprehension led to some of the mummies as well as some papyri, architectural and sculptural views to be represented in colour, either by using watercolours or by making the engravings directly in colour. The representation of these images, associated with the scientific rigour that Winckelmann had already imposed on the study of Greek and Roman antiquities, was to be the germ of the scientific discipline of Egyptology as well as of modern archaeology.

There are three volumes devoted to Natural History, the first two published in 1809 under Napoleon's government and the third one in 1817 under the reign of Louis XVIII. The engravings they contain, all of them intaglio, feature the flora and wildlife of Egypt at the time of the expedition. As occurs with the rest of the plates, the images are identified in a scientific manner, indicating the volume to which they belong, the general and particular iconography and the names of the draughtsman and the engraver. Following the methodology employed in other works of this type, the different specimens are classified and arranged by families, offering different aspects of them, the general image and the particular elements. What is striking is the absence of the large mammals existing in Egypt, perhaps owing to the fact that in reality the selection of images was bound by what could be salvaged from what the English had seized. And given this absence, it is interesting to see how exhaustively compiled are the minor fauna such as insects, crustaceans, molluscs, etc., both terrestrial and marine. These representations form part of the natural history compilations made during the scientific and expeditionary travels of the 18th and 19th centuries, with some of those images being used in the repertoires later published by other authors.

Finally, a further two volumes are devoted to the compilation of images of the Modern Era, respectively published in 1809 and 1817, the former during Napoleon's reign and the latter under Louis XVIII, featuring the image of Egypt under Muslim culture. Intaglio engravings and etchings show general landscapes and urban and monumental vistas, similar to those on the antiquity plates, and in this case seeking the exoticism of the oriental world in line with the dominant orientalism of the time. Together with the architectural images, the human figure is given much weight, both in the presentation of portraits of Egypt's rulers on the dates of the expedition and, above all, in featuring the popular types that populated the country, portraits that would become one of the principal iconographic themes of photography. Equal attention is paid to trades, both urban and rural, presented in a scenographic manner, with the worker situated in his working environment, or to the representation of technical and scientific, artistic and ethnographic instruments. The compilation of these images was driven by the French government's intention to transform the conquered Egypt into a French colony, which led to the need to learn about modern Egypt to thus facilitate its long-term occupation.

Ignacio Miguéliz



DESCRIPTION DE L'ÉGYPTE,

OU

RECUEIL

DES OBSERVATIONS ET DES RECHERCHES

QUI ONT ÉTÉ FAITES EN ÉGYPTE

PENDANT L'EXPÉDITION DE L'ARMÉE FRANÇAISE,

PUBLIÉ

PAR LES ORDRES DE SA MAJESTÉ L'EMPEREUR

NAPOLÉON LE GRAND.

ANTIQUITÉS, PLANCHES.

TOME PREMIER.

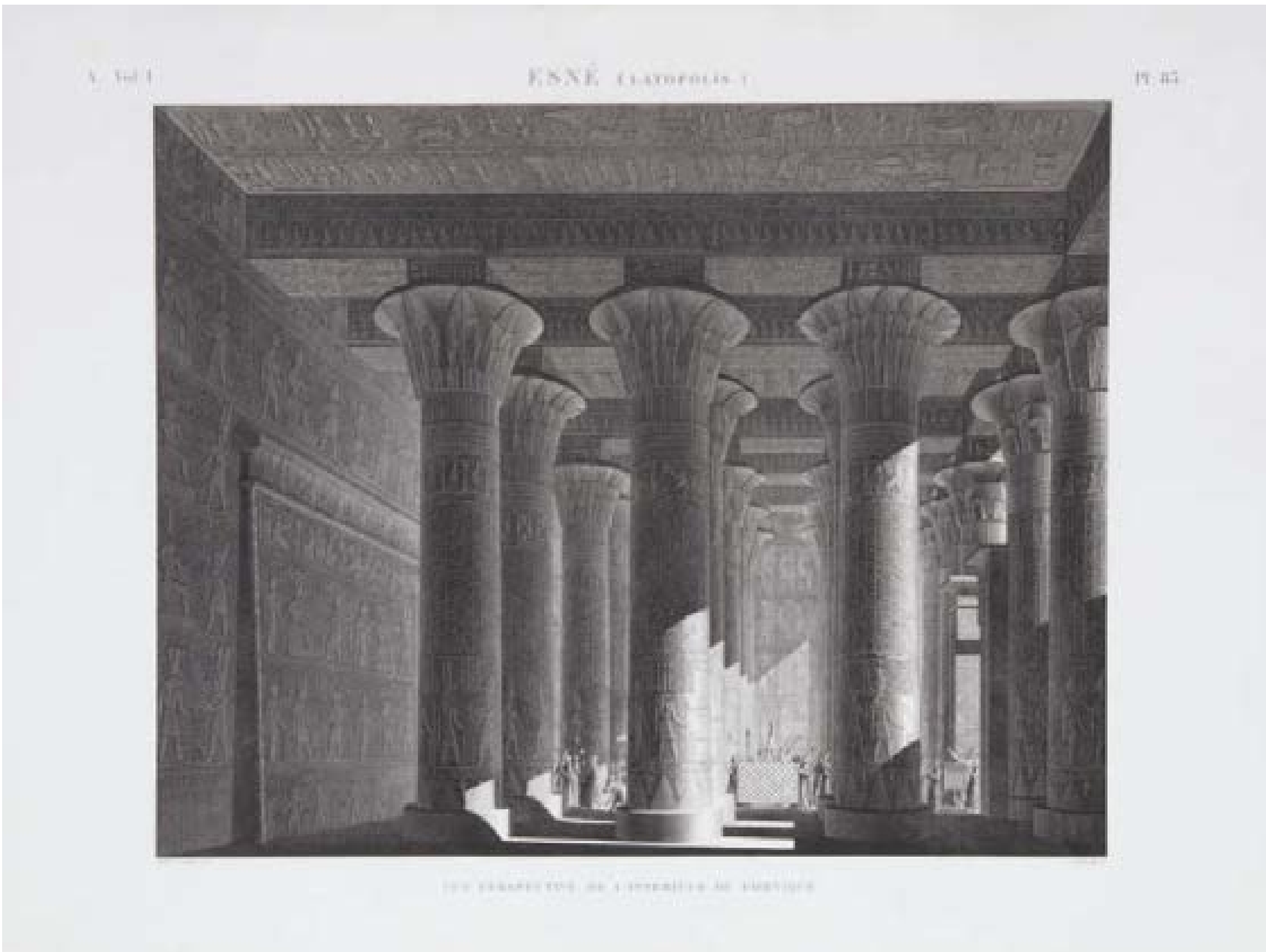
A PARIS,

DE L'IMPRIMERIE IMPÉRIALE.

M. DCCC. IX.

Front cover, Plates. Antiquities I. Volume I.

Erment (Hermonthis.) Vue du Temple prise à l'ouest.
Drawing: Dutertre. Engraving: Lorieux and Berthault. Plates. Antiquities. Volume I. Plate 92.

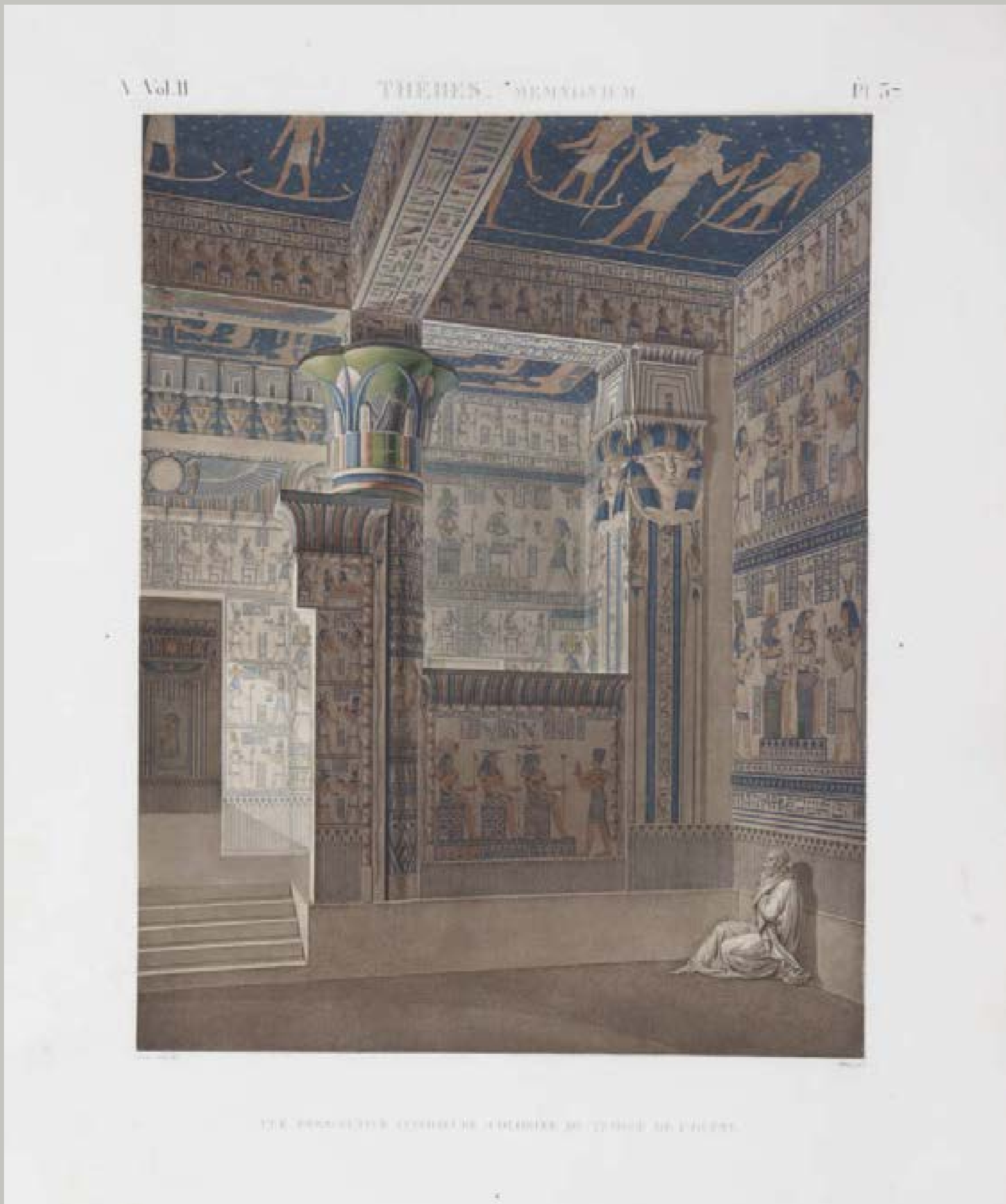


Esné (Latopolis.) Vue perspective de l'intérieur du portique.
Drawing: Jollois and Devilliers. Engraving: Sellier fils, Plates. Antiquities. Volume I. Plate 83.

Environs d'Esné (Latopolis). Vue pérspective du Temple au Nord d'Esné.
Drawing: Jollois and Develliers. Engraving: Lorieux. Plates. Antiquities. Volume I. Plate 88.

Edfou (Apollinopolis Magna). Élévation du portique du Grand Temple.
Drawing: Lepère arch. Engraving: Louvet. Plates. Antiquities. Volume I. Plate 53.

Edfou (Apollinopolis Magna). Vue perspective du petit temple.
Drawing: Lepère arch. Engraving: Schröder. Plates. Antiquities. Volume I. Plate 65.



Thèbes. Memnonium. Vue perspective intérieure colorée du temple de l'ouest.
DDrawing: Lepére arch. Engraving: Allais. Plates. Antiquities. Volume II. Plate 37.

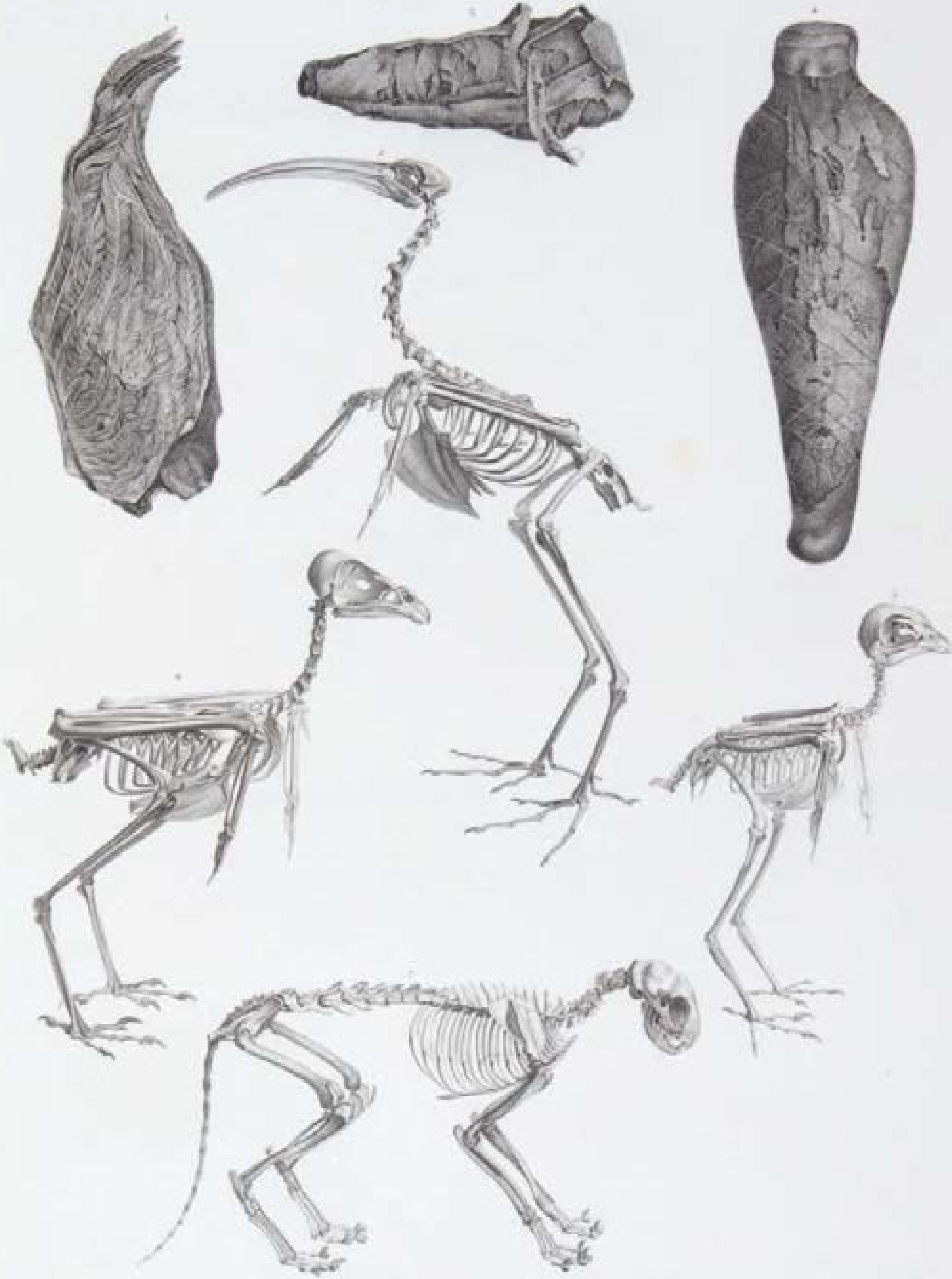
Thèbes. Medynet - Abou. Vue intérieure du péristyle du palais.
Drawing: Balzac. Engraving: Reville. Plates. Antiquities. Volume II. Plate 14.

Thèbes. Memnonium. Vue des deux colosses.
Drawing: Dutertre. Engraving: Baltard. Plates. Antiquities. Volume II. Plate 20.

Thèbes. Hypogées. Profil et face d'une tête de momie de femme. Tiré de la Collection de Mr. Delile. Drawing: M. M. Dutertre and H. J. Redouté. Engraving: Monsaldy. Plates. Antiquities. Volume II. Plates 49 and 50.

Thèbes. Hypogées. Momies d'oiseaux et squelettes de momies. Tiré de la Collection de Mr. Geoffroy St. Hilaire. Engraving: Charles. Plates. Antiquities. Volume II. Plate 54.

THÈBES. HYPOGÉES.



MOMIES D'OISEAUX ET SQUELETTES DE MOMIES.

Thèbes, Louqsor. Détails des colosses oriental et occidental placés près de la porte du palais. Drawing: H. J. Redouté and Cécile. Engraving: Baltard. Plates. Antiquities. Volume III. Plate 13.

Thèbes, Karnak. Vue perspective intérieure du palais, prise de l'est. Drawing: Le Pere. Engraving: Coquet. Plates. Antiquities. Volume III. Plate 42.

Thèbes, Karnak. Vue du palais prise de l'intérieur de la cour. Drawing: Cécile. Engraving: Lienard. Etching: Desmaisons. Plates. Antiquities. Volume III. Plate 19.

Thèbes, Karnak. Vue d’un colosse placé à l’entrée de la salle hypostyle du palais.
Drawing: Dutertre. Engraving: Baltard. Plates. Antiquities. Volume III. Plate 20.

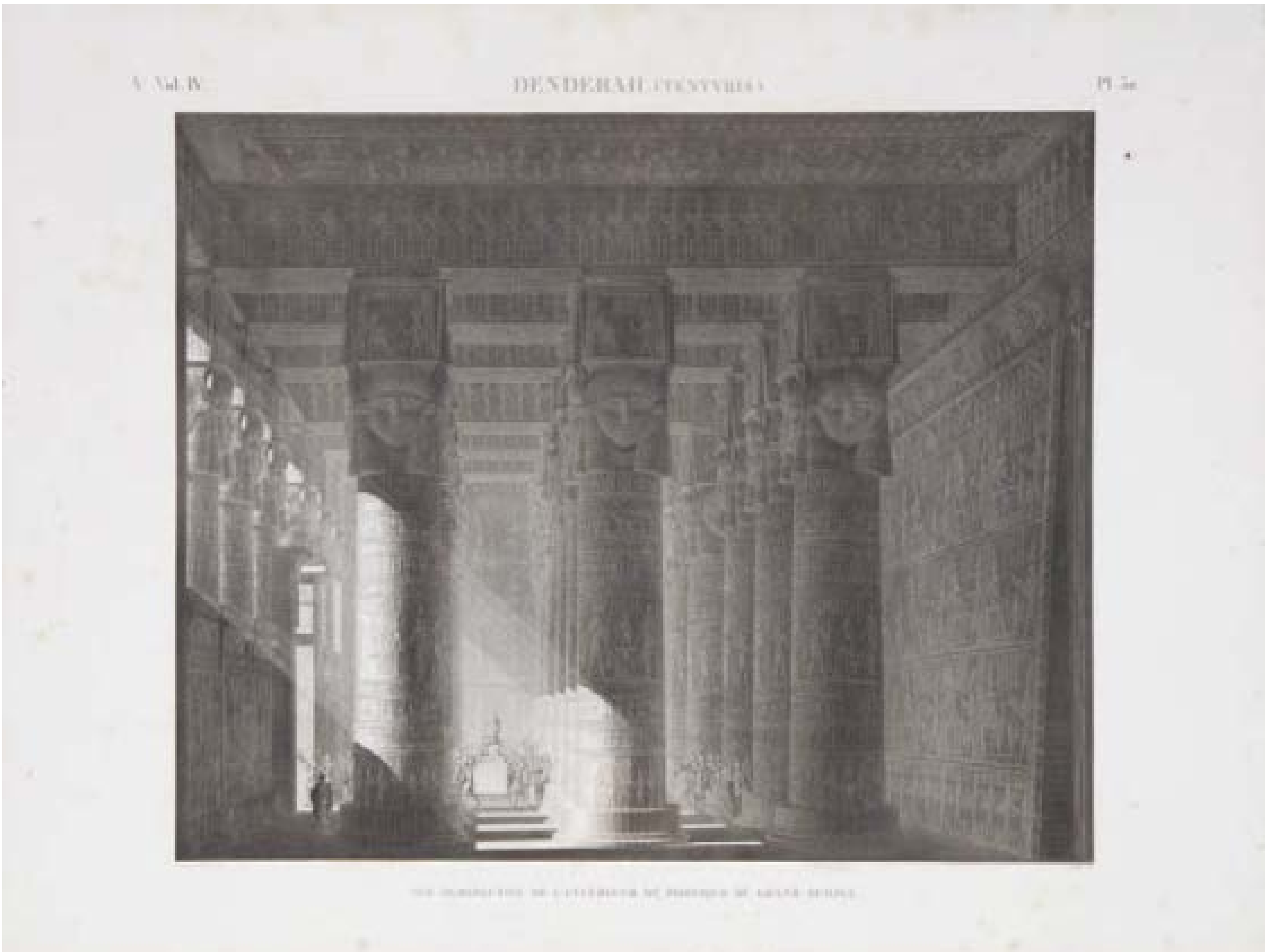
Achmouneyn. (Hermópolis Magna). Vue du portique prise du côté du midi.
Drawing: Cécile. Engraving: Duhamel. Etching: Beaugean.
Plates. Antiquities. Volume IV. Plate 51.

Denderah (Tentyris). Élévation du portique du Grand Temple.
Drawing: Jollois and Devilliers. Engraving: Coquet.
Plates. Antiquities. Volume IV. Plate 9.

Qàou El Kebyreh. (Antaeopolis). Vue perspective du temple.
Drawing: Chabrol and Jomard. Engraving: Dupare. Etching: Reville.
Plates. Antiquities. Volume IV. Plate 42.

Qàou El Kebyreh. (Antaeopolis). Vue du temple, prise du côté de l'ouest.
Drawing: Dutertre. Engraving: Beaugean.
Plates. Antiquities. Volume IV. Plate 39.

Denderah (Tentyris). 1 Détail coloreé d'une colonne du portique. 2…7 Profil et plans de la colonne.
Drawing: Lepére arch. Engraving: Allais. Plates. Antiquities. Volume IV. Plate 12.



Denderah (Tentyris). Vue perspective de l’intérieur du portique du Grand Temple.
Drawing: Jollois and Devilliers. Engraving: Sellier. Plates. Antiquities. Volume IV. Plate 30.

Collection d’antiques. 1...5 Figures en bronze. 6. Buste en basalte gris.
Drawing: Castex. Engraving: Gauthier.
Plates. Antiquities. Volume V. Plate 63.

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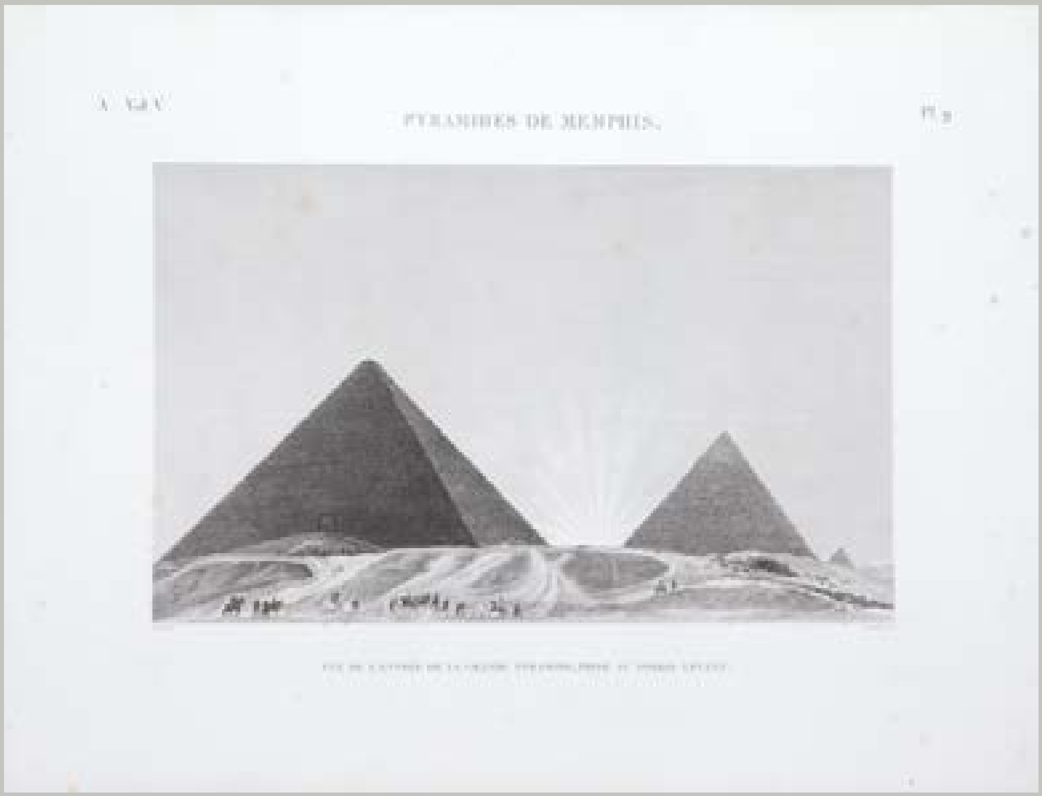
1...5 FIGURES EN BRONZE, 6 BUSTE EN BASALTE GRIS.

Pyramides de Memphis. Vue de la seconde pyramide, prise du coté de levant.
Drawing: Dutertre. Engraving: Beaugean. Etching: Beaugean. Plates. Antiquities. Volume V. Plate 10.



Pyramides de Memphis. Vue de l'entrée de la grande pyramide, prise au soleil levant.
Drawing: Cécile. Engraving: Schroeder. Plates. Antiquities. Volume V. Plate 9.

Pyramides de Memphis. Vue du sphinx et de la grande pyramide, prise du sud-est.
Drawing: Conté. Engraving: Schroeder. Plates. Antiquities. Volume V. Plate 11.

Pyramides de Memphis. Vue du sphinx et de la seconde pyramide, prise du levant.
Drawing: Dutertre. Engraving: Baltard. Plates. Antiquities. Volume V. Plate 12.

Le Kaire. Vue perspective extérieure de la mosquée de Soultân Hasan.
Drawing: Protain. Engraving: Reville. Plates. Modern Age. Volume I. Plate 38

Le Kaire. Vue intérieure de la maison d'Osmân Bey.
Drawing: Balzac. Engraving: Baltard and Texier. Plates. Modern Age. Volume I. Plate 50.

Environs du Kaire. Vue du port et de la grande mosquée de Boulâq.
Drawing: Balzac. Engraving: Baltard. Plates. Modern Age. Volume I. Plate 25.

Le Kaire. Vue perspective de la porte appelée Bab El Nasr.
Drawing: Protain. Engraving: Baltard. Plates. Modern Age. Volume I. Plate 46..

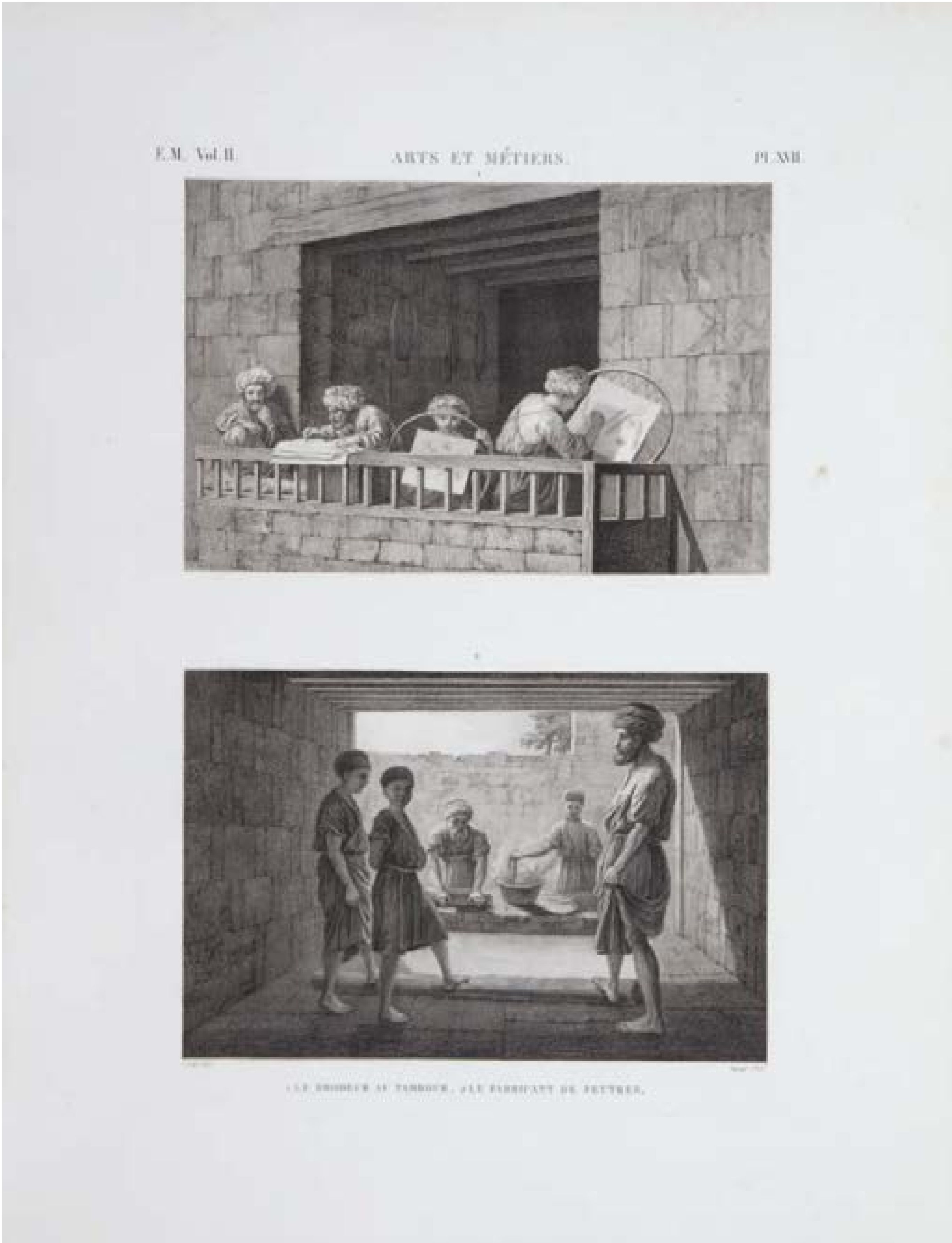
Le Kaire. Vue de la mosquée de Soultân Hasan. Drawing: Conté. Engraving: Berthault.
Plates. Modern Age. Volume I. Plate 32.

Le Kaire. Vue d'une ancienne mosquée située
près de Bâb El Nasr. Drawing: Dutertre.
Engraving: Delignon. Etching: Reville and Normand.
Plates. Modern Age. Volume I. Plate 28.

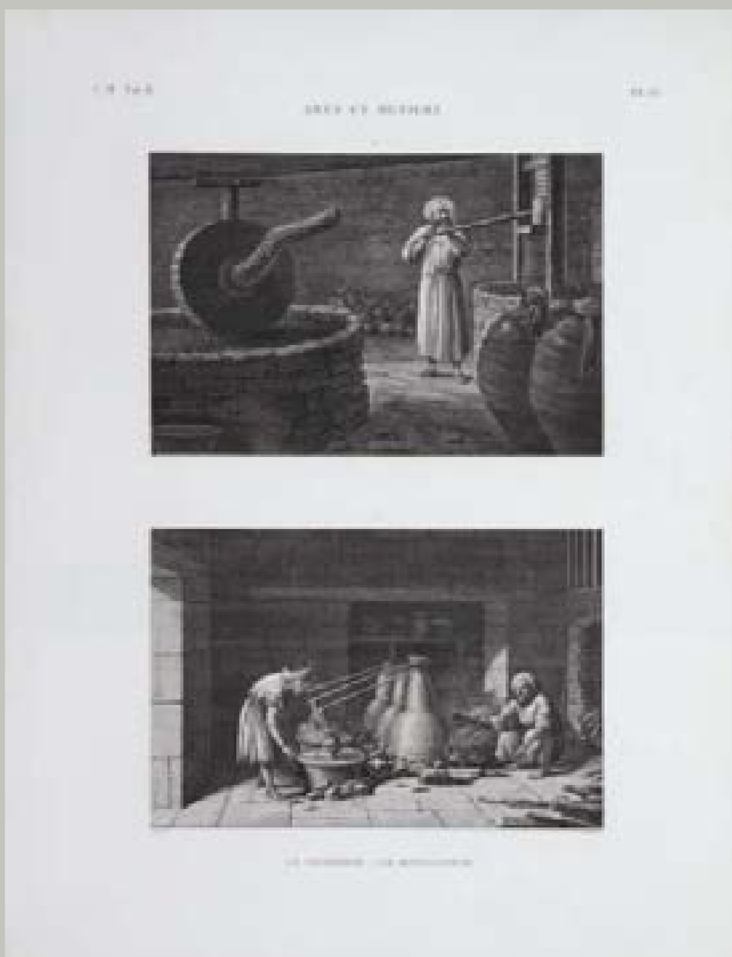
VUE D'UNE ANCIENNE MOSQUÉE SITUÉE PRÈS DE BÂB EL NASR.

Costumes et portraits. Mourâd Bey. Drawing: Dutertre. Engraving: Ponce.
Plates. Modern Age. Volume II. Plate G.

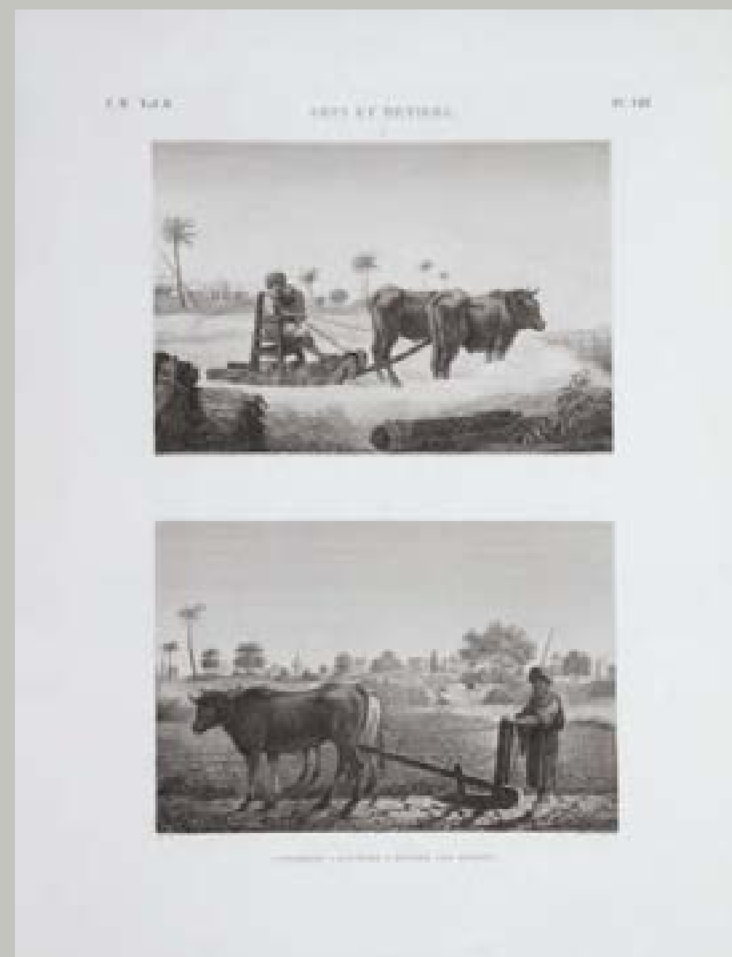
Arts et métiers. 1. Le chaudronnier. 2. Le forgeron. Drawing: Conté. Engraving: Voysard.
Plates. Modern Age. Volume II. Plate XXI.



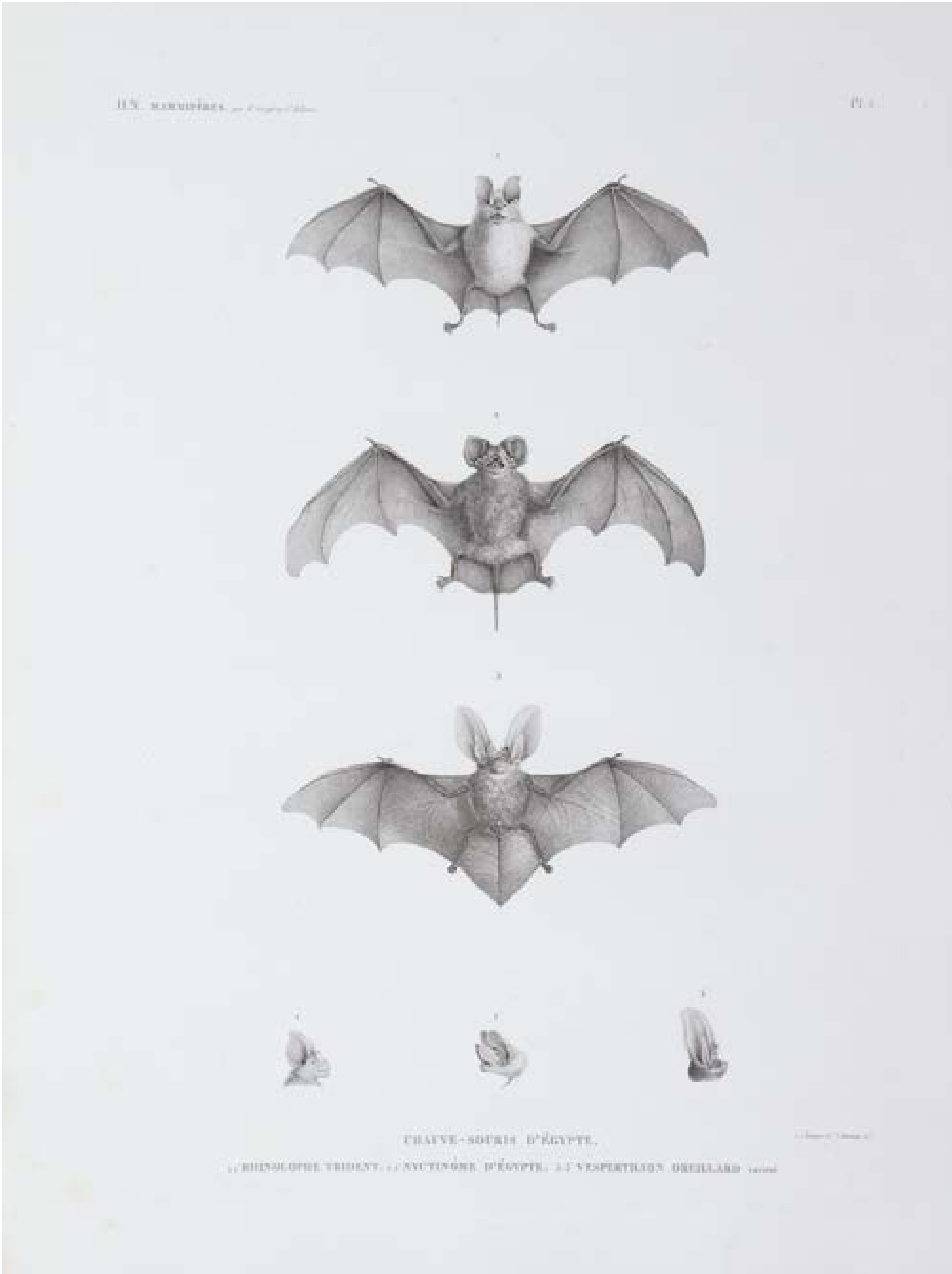
Arts et métiers. 1. Le brodeur au tambour. 2. Le fabricant de feutres. Drawing: Conté. Engraving: Ingouf.
Plates. Modern Age. Volume II. Plate XVII.



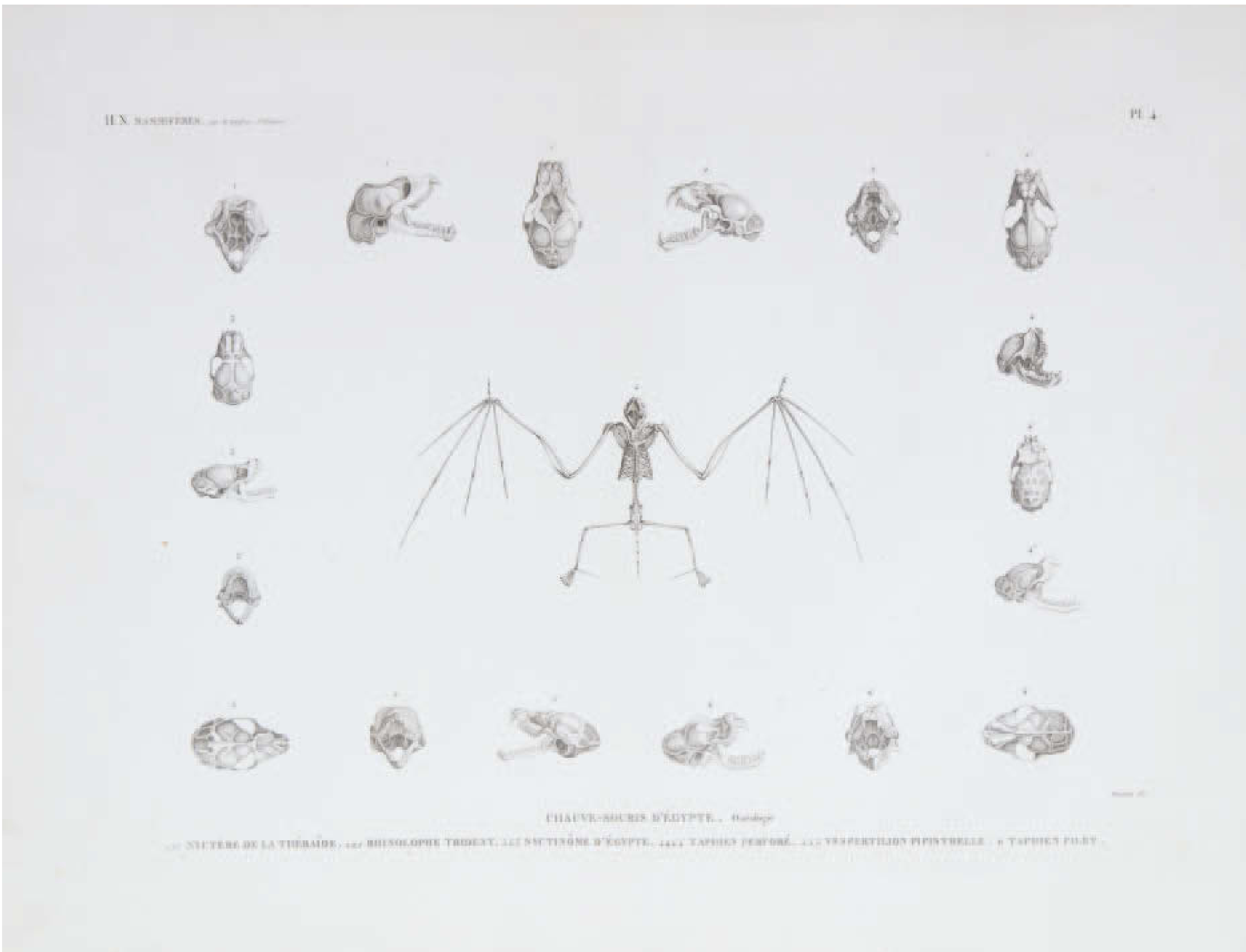
Arts et métiers. 1. Le vinaigrier. 2. Le distillateur.
Drawing: Conté. Engraving: Delaunay.
Plates. Modern Age. Volume II. Plate XI.



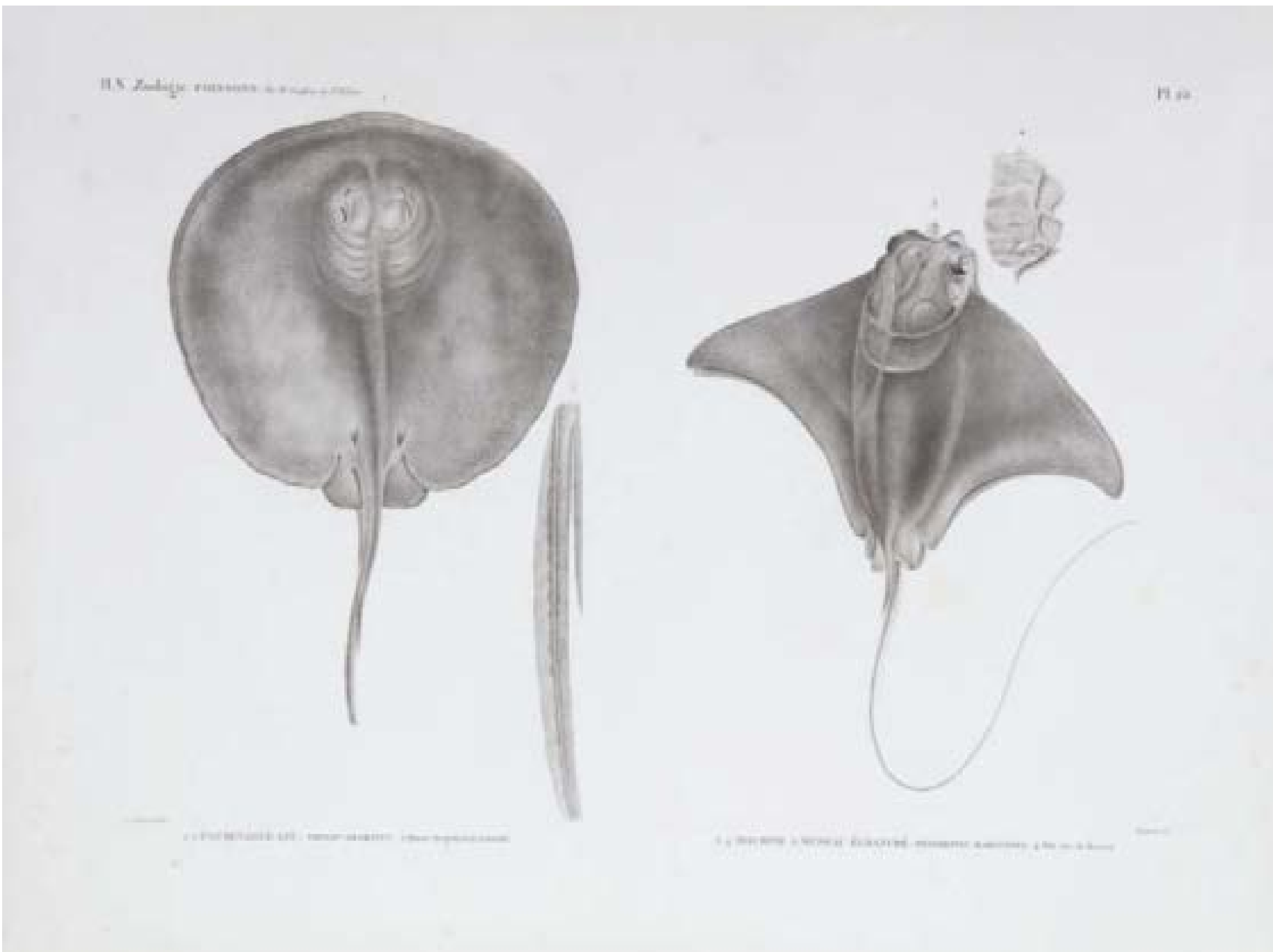
Arts et métiers. 1. Charrue. 2. Machine a battre les grains.
Drawing: Conté. Engraving: Delaunay and Schroeder.
Plates. Modern Age. Volume II. Plate VIII.



Mammifères. Chauve-souris d'Égypte. 1,1' Rhinolophe trident. 2,2' Nyctinôme d'Égypte. 3,3' Vespertilion oreillard variété.
Drawing: M. Geoffroy St. Hilaire. Engraving: 1.2 Bouquet, 3 Duhamel. Plates. Natural History. Volume I. Plate 2.

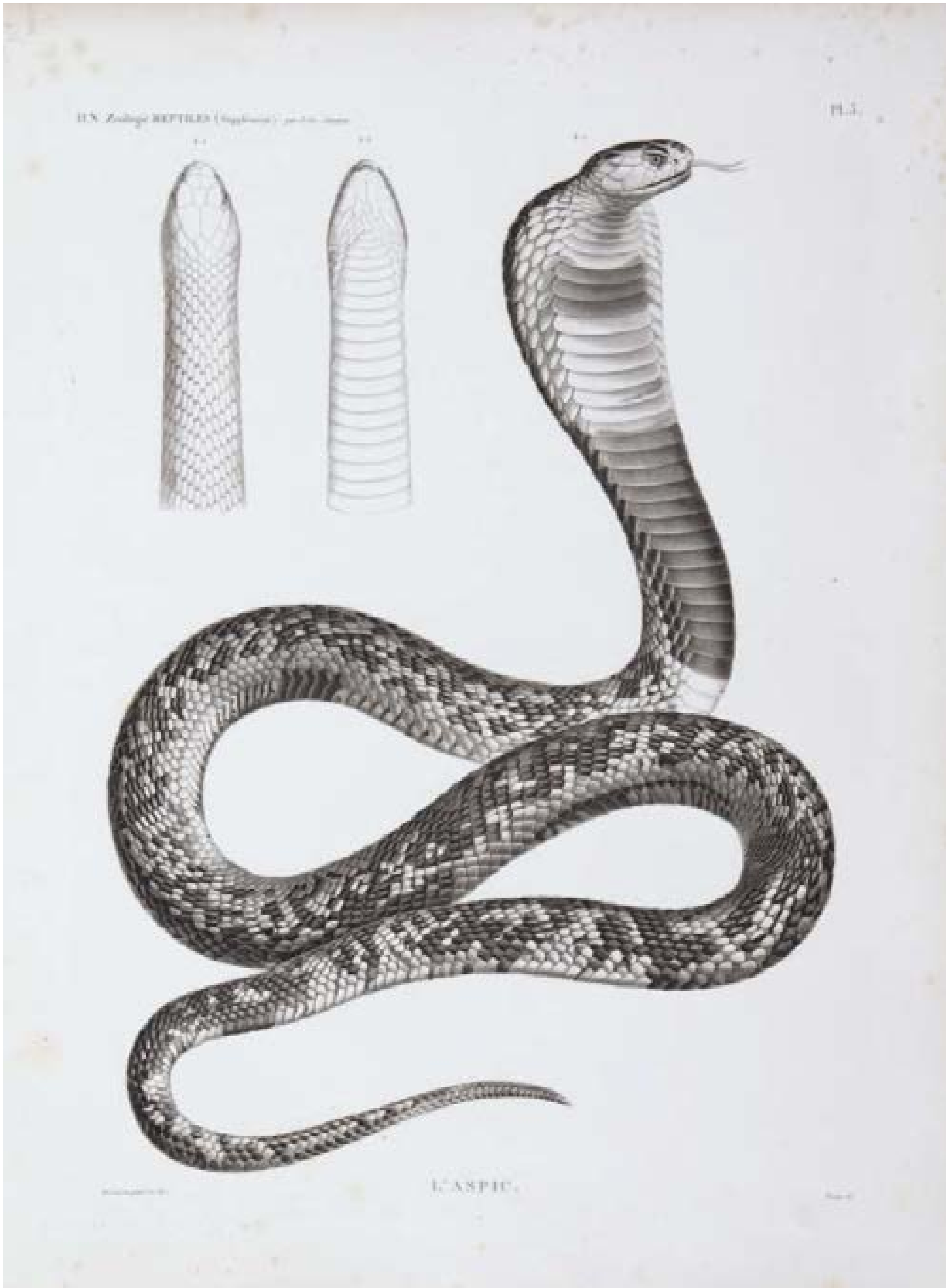


Mammifères. Chauve-souris d'Égypte. Ostéologie. 1,1',1'' Nyctère de la thébaïde. 2,2',2'' Rhinolophe trident. 3,3',3'' Nyctinöme d'Égypte. 4,4',4'',4''' Taphien perforé. 5,5',5'' Vespertilion pipistrelle. 6 Taphien filet.
Drawing: M. Geoffroy St. Hilaire. Engraving: Bouquet. Plates. Natural History. Volume I. Plate 4.



Zoologie. Poissons. 1.2 Pastenague lot. Trygon Grabatus. 2 Queue de grandeur naturalle. 3.4 Mourine à museau échancré. Myliobatis marginata. 4 Tête vue en dessous. Drawing: M. Geoffroy de St. Hilaire and H. J. Redouté. Engraving: Bouquet. Plates. Natural History. Volume I. Plate 25.

Mammifères. Chauve-souris d'Égypte. Ostéologie. 1 Rat d'Alexandrie. 2 Echimis d'Égypte. 3 Hérisson oriellard.
Drawing: M. Geoffroy St. Hilaire. Engraving: Biosse. Plates. Natural History. Volume I. Plate 5.



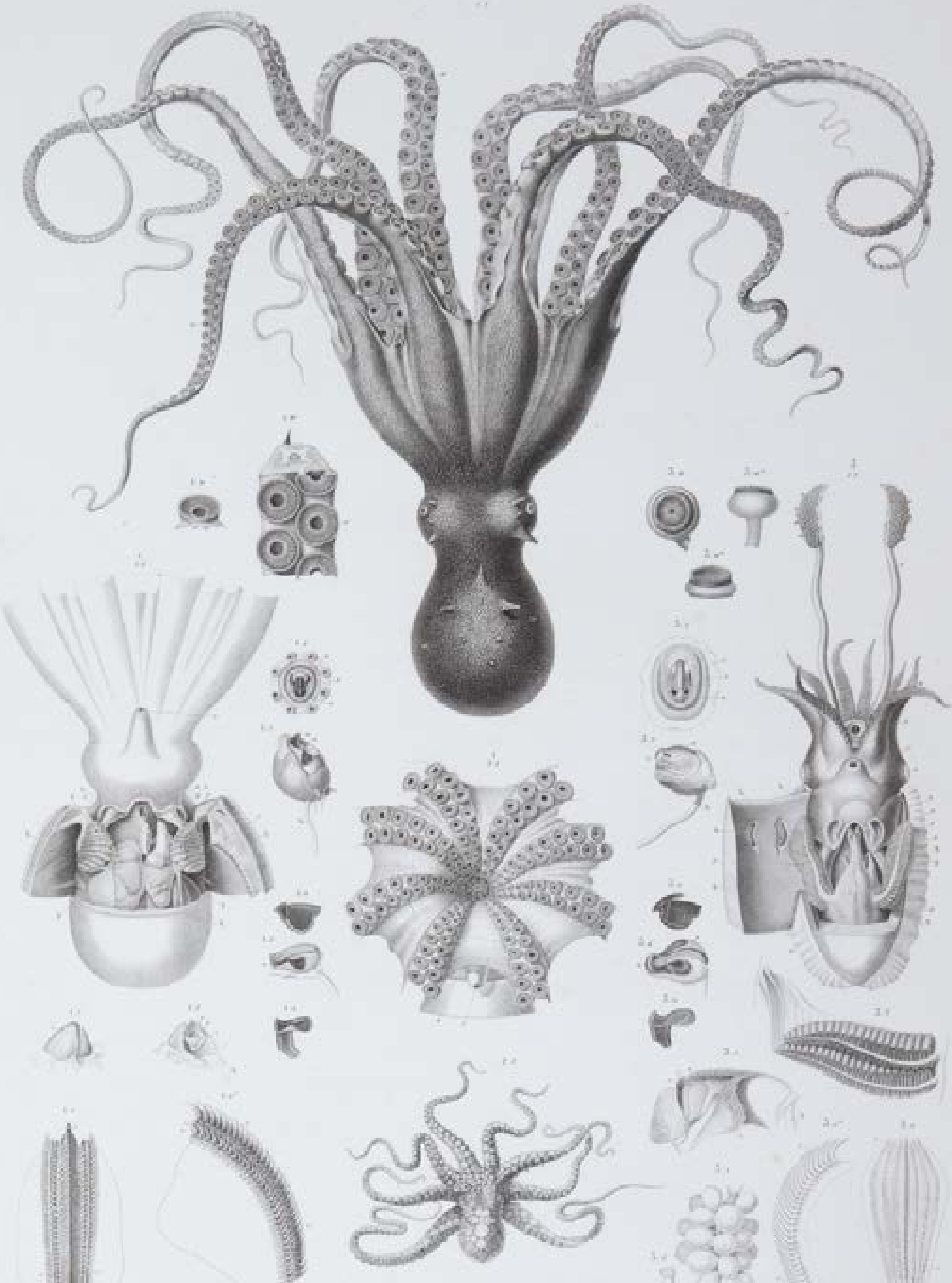
Zoologie. Reptiles (Supplément). L'aspic. Drawing: J. Ces. Savigny. Engraving: Tresca. Plates. Natural History. Volume I. Plate 3.

Zoologie. Reptiles (Supplément). Couleuvres.
Drawing: J. Ces. Savigny. Engraving: Tavernier.
Plates. Natural History. Volume I. Plate 5.

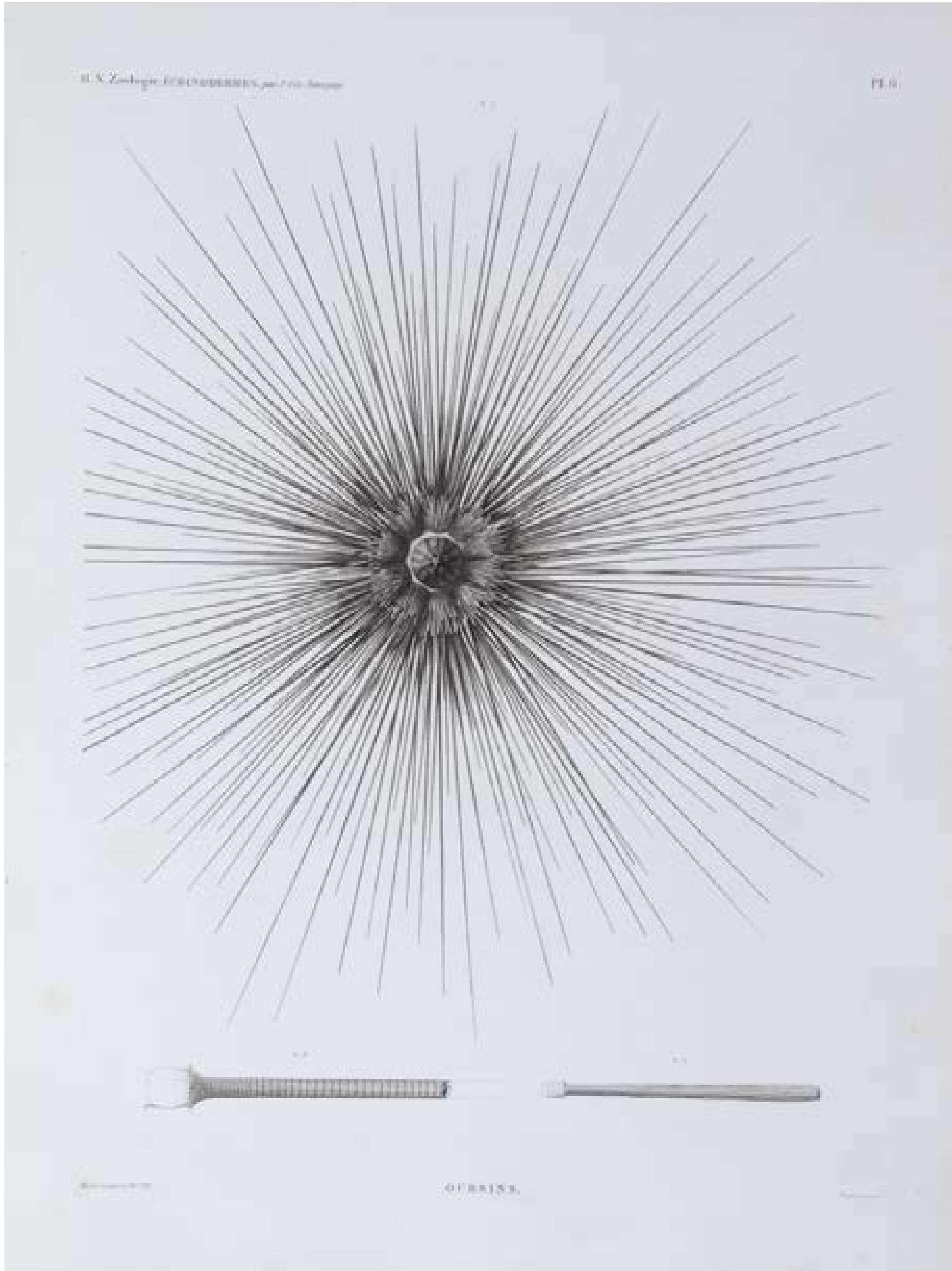
Zoologie. Reptiles (Supplément). Vipères et couleuvres.
Drawing: J. Ces. Savigny. Engraving: Tavernier.
Plates. Natural History. Volume I. Plate 4.

Zoologie. Oiseaux. Drawing: J. Ces. Savigny. Engraving: Bouquet. Plates. Natural History. Volume I. Plate 11.

Zoologie. Oiseaux. Drawing: J. Ces. Savigny. Engraving: Bouquet. Plates. Natural History. Volume I. Plate 12.

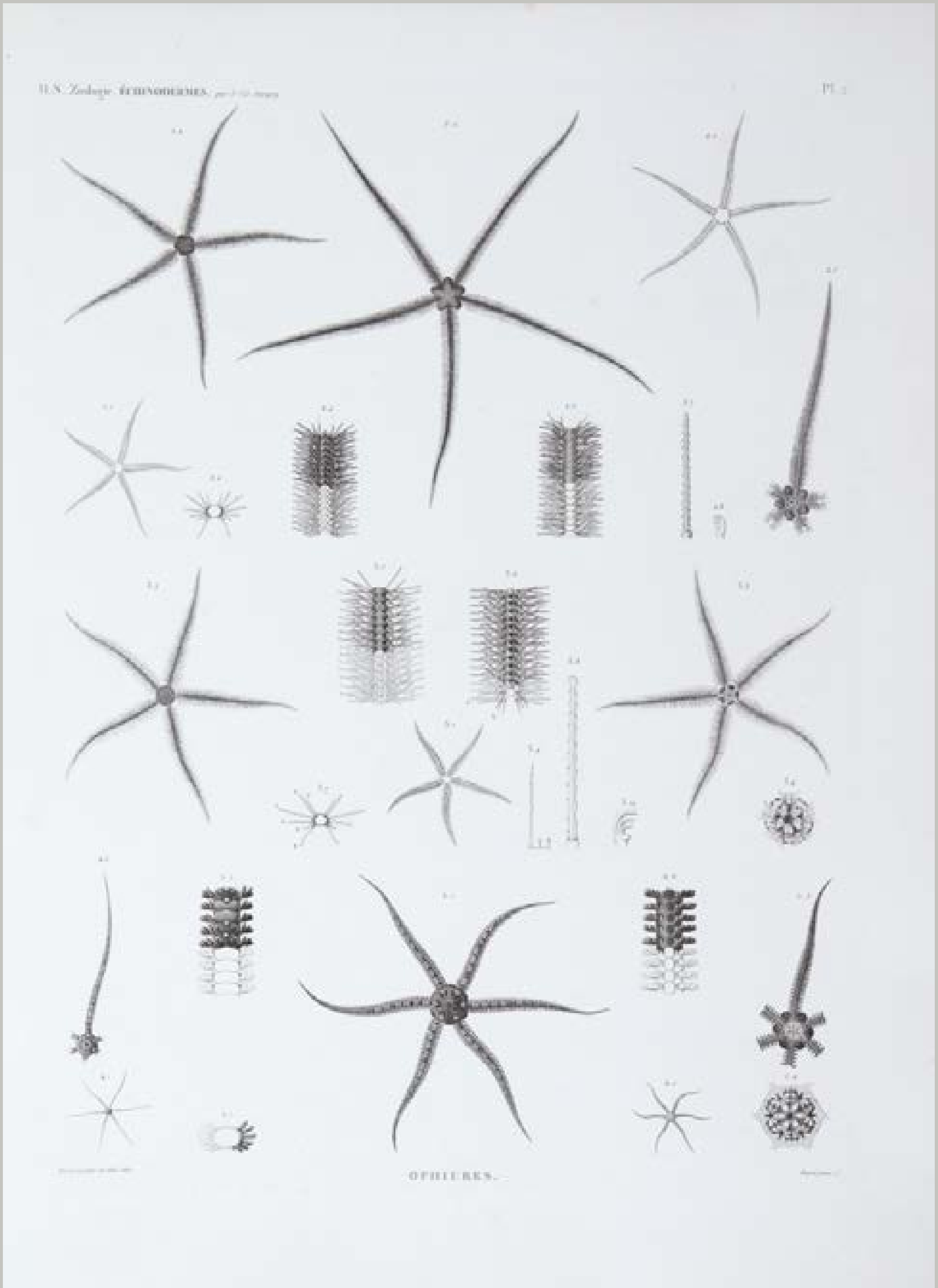


POULPES. SÈCHES.

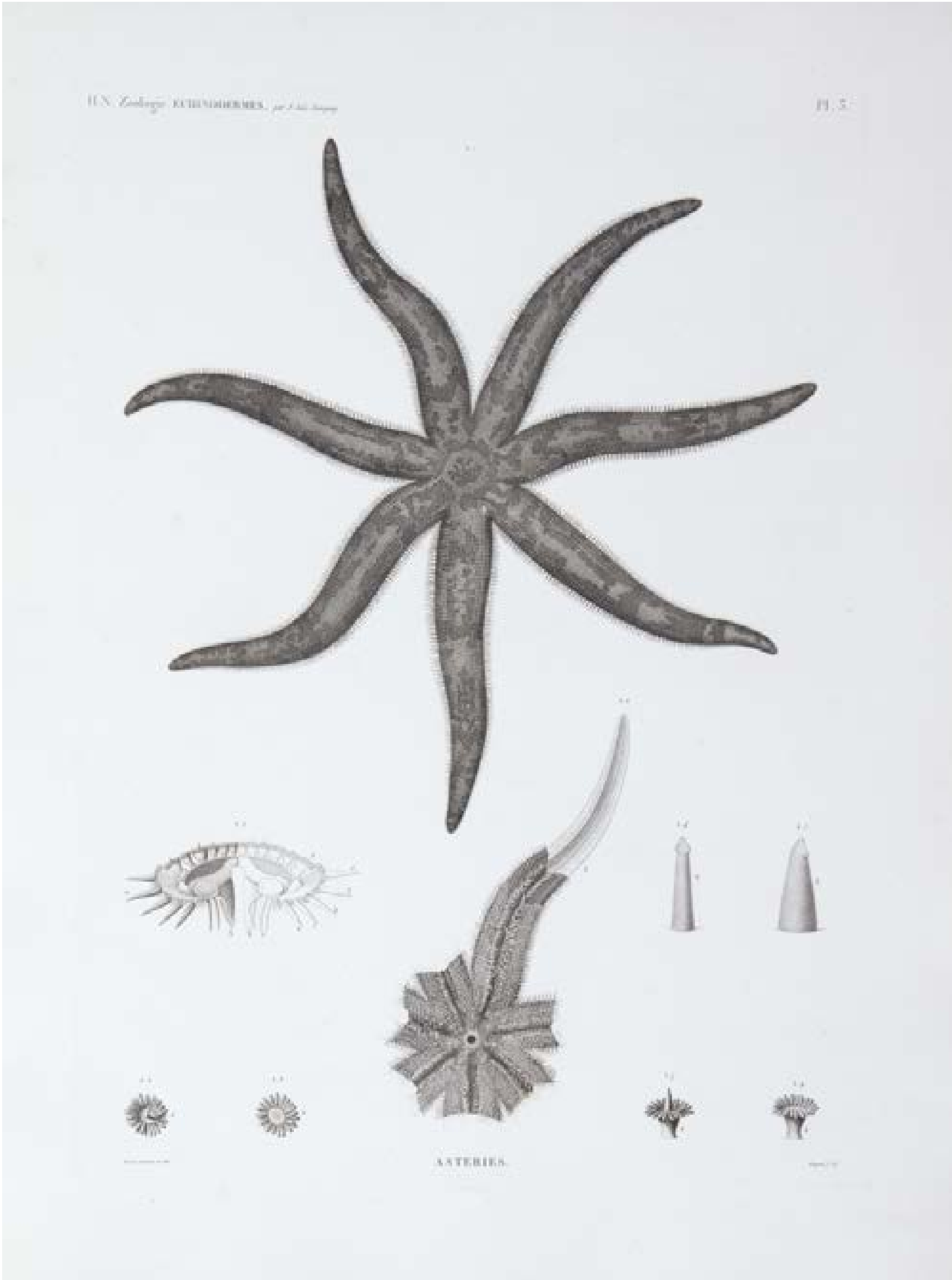


Zoologie. Échinodermes. Oursins. Drawing: J. C. Sevigny. Engraving: Boquet jeune.
Plates. Natural History. Volume II. Plate 6.

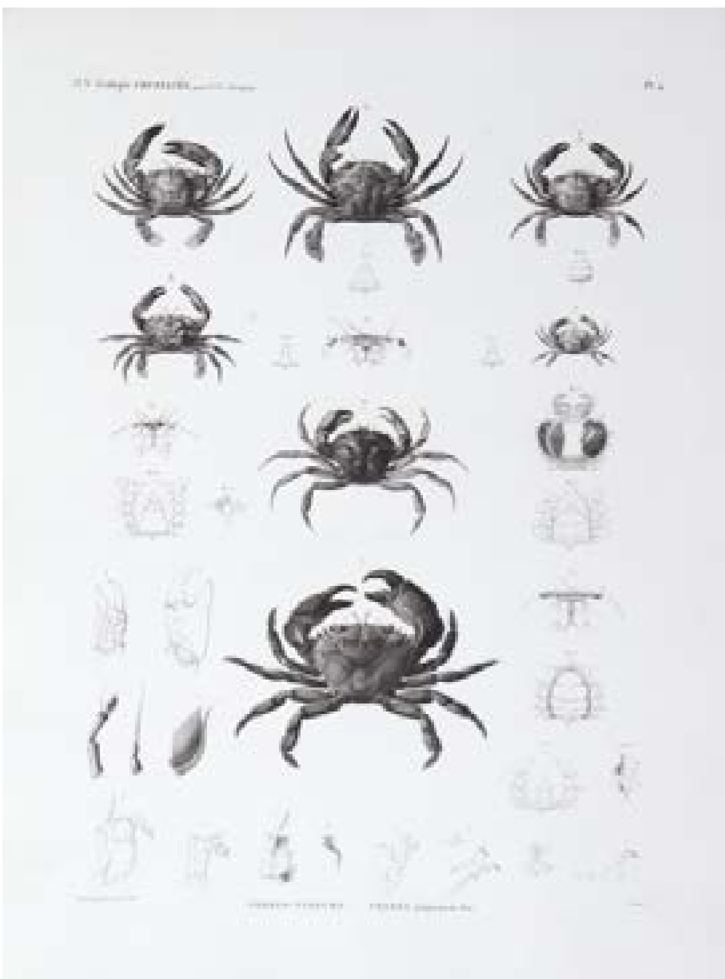
Zoologie. Céphalopodes. Poulpes. Sèches.
Drawing: J. C. Savigny. Engraving: Forsell.
Plates. Natural History. Volume II. Plate 1.



Zoologie. Échinodermes. Ophiures. Drawing: J. C. Sevigny. Engraving: Boquet jeune.
Plates. Natural History. Volume II. Plate 2. 1805-1812

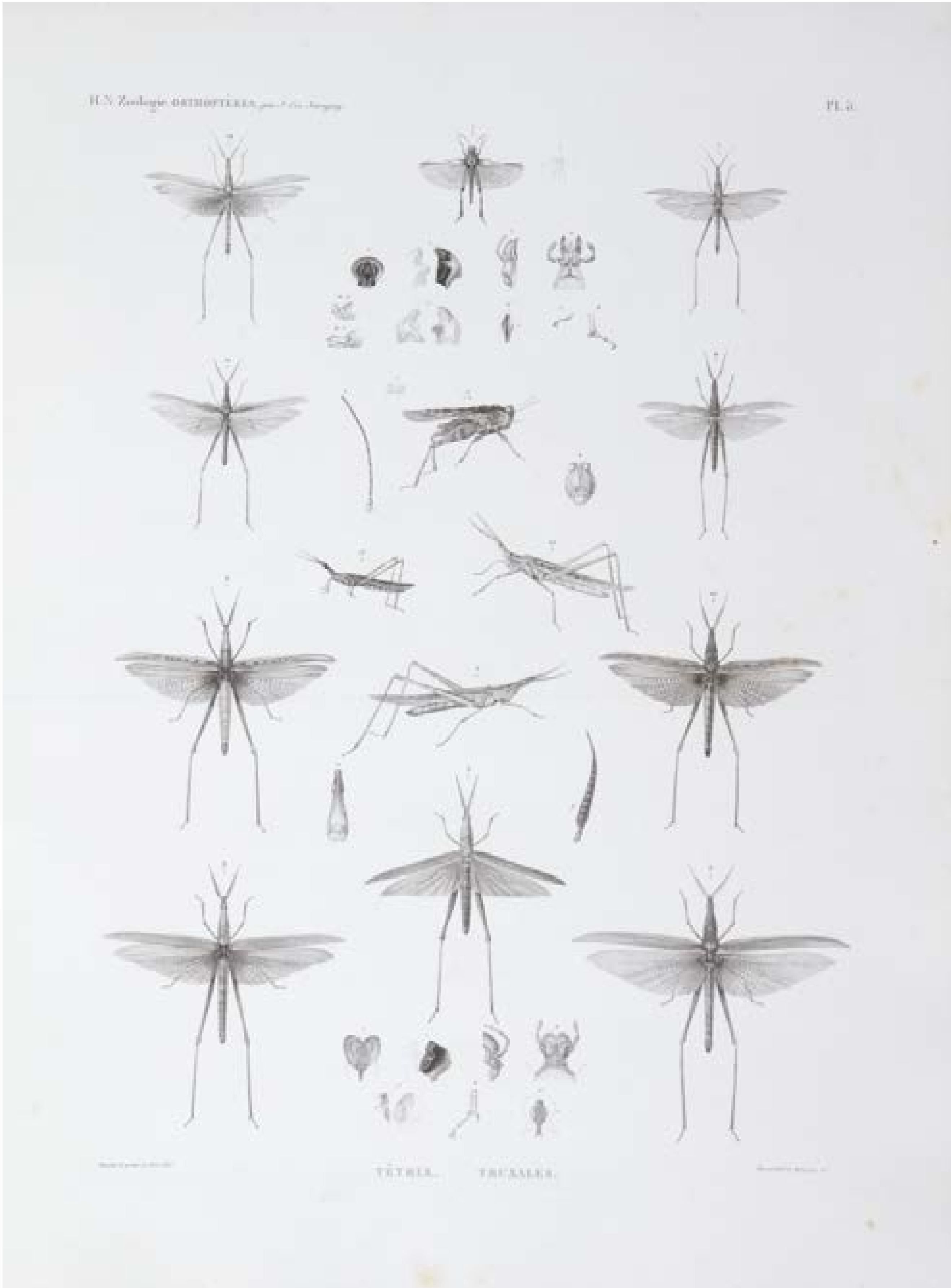


Zoologie. Échinodermes. Asteries. Drawing: J.C. Sevigny. Engraving: Boquet jeune.
Plates. Natural History. Volume II. Plate 3.



Zoologie. Crustacés. Crabes - Nageurs. Drawing: J. C. Savigny. Engraving: Forget. Plates. Natural History. Volume II. Plate 4.

Zoologie. Crustacés. Crabes - Nageurs. Drawing: J. C. Savigny. Engraving: Renard. Plates. Natural History. Volume II. Plate 3.



Zoologie. Orthoptères. Tetris. Truxales. Drawing: J. C. Sevigny. Engraving: Karnonkel and Manceau.
Plates. Natural History. Volume II. Plate 5.

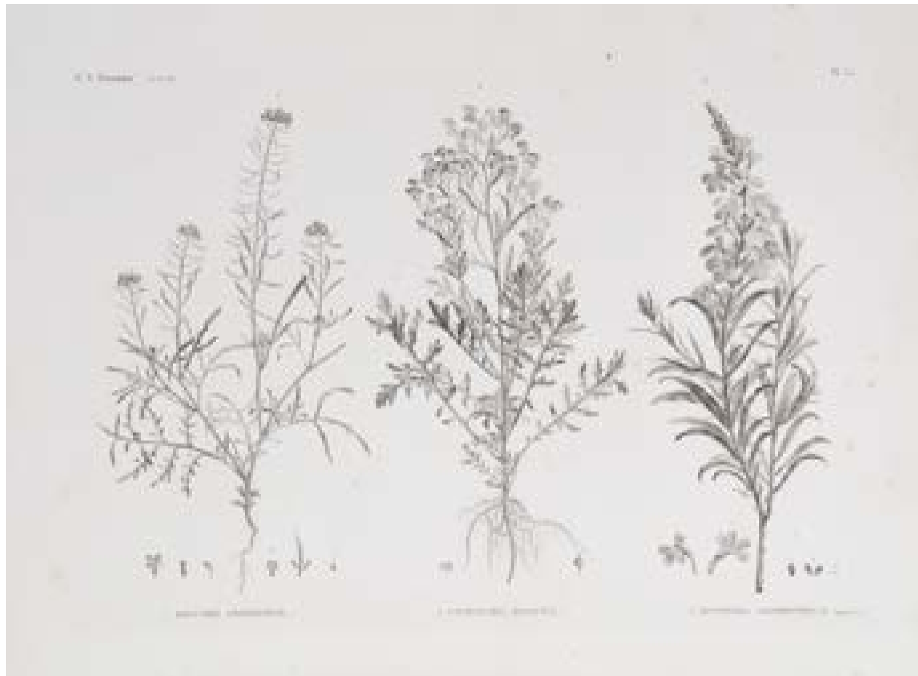
Minéralogie. Déserts situés entre le Nil et la Mer Rouge. Variétés de porphyre. Dibujo: M. Roziere. Engraving: 1.2 Canu, 3...8 Allais. Plates. Natural History. Volume II. Plate 8.

Minéralogie. Éléphantine et environs de Syene. Roches primitives avec les divers accidens qu'elles presentent. Drawing: M. Roziere. Engraving: Lambert. Plates. Natural History. Volume II. Plate 2.

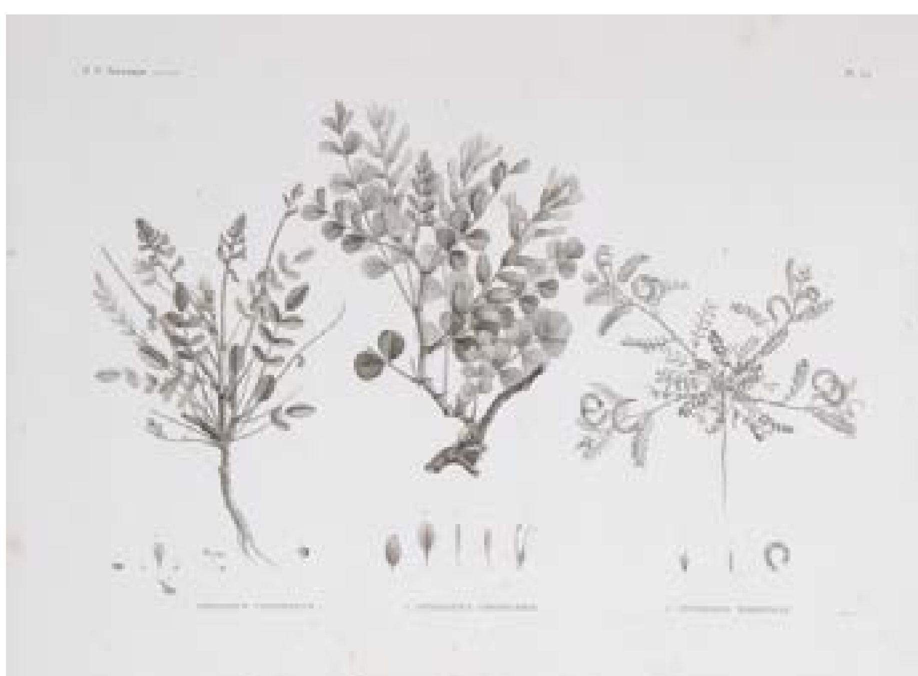
Minéralogie. Tombeaux des rois, pyramides de Memphis. 1.2.3.4 Pierres siliceuses figurées. 5.6.8.9 Pierres calcaires employées à la construction des pyramides. 7.10.11.12 Coquilles fossiles. Drawing: M. Roziere. Engraving: 1...6.9 Masson, 7.10.11 Moithey, 8.12 Goulet. Plates. Natural History. Volume II. Plate 5.

Minéralogie. Gebel Selseleh &c. Montagne Rouge &c. 1.2.3.4 Pouddingue memnonien. 5 Caillou d'Égypte. 6.8.9 Grès ferrugineux. 7.10.11.12 Grès monumental. 13 Grès à ciment siliceux. Drawing: M. Rozière. Engraving: 1.2.6 Lepine, 7.9.13 Goulet, 5 Masson, 3.4.8.10.11.12 Lavallé. Etching engraver: 1.2.6.8 Tassaert. Plates. Natural History. Volume II. Plate 4.

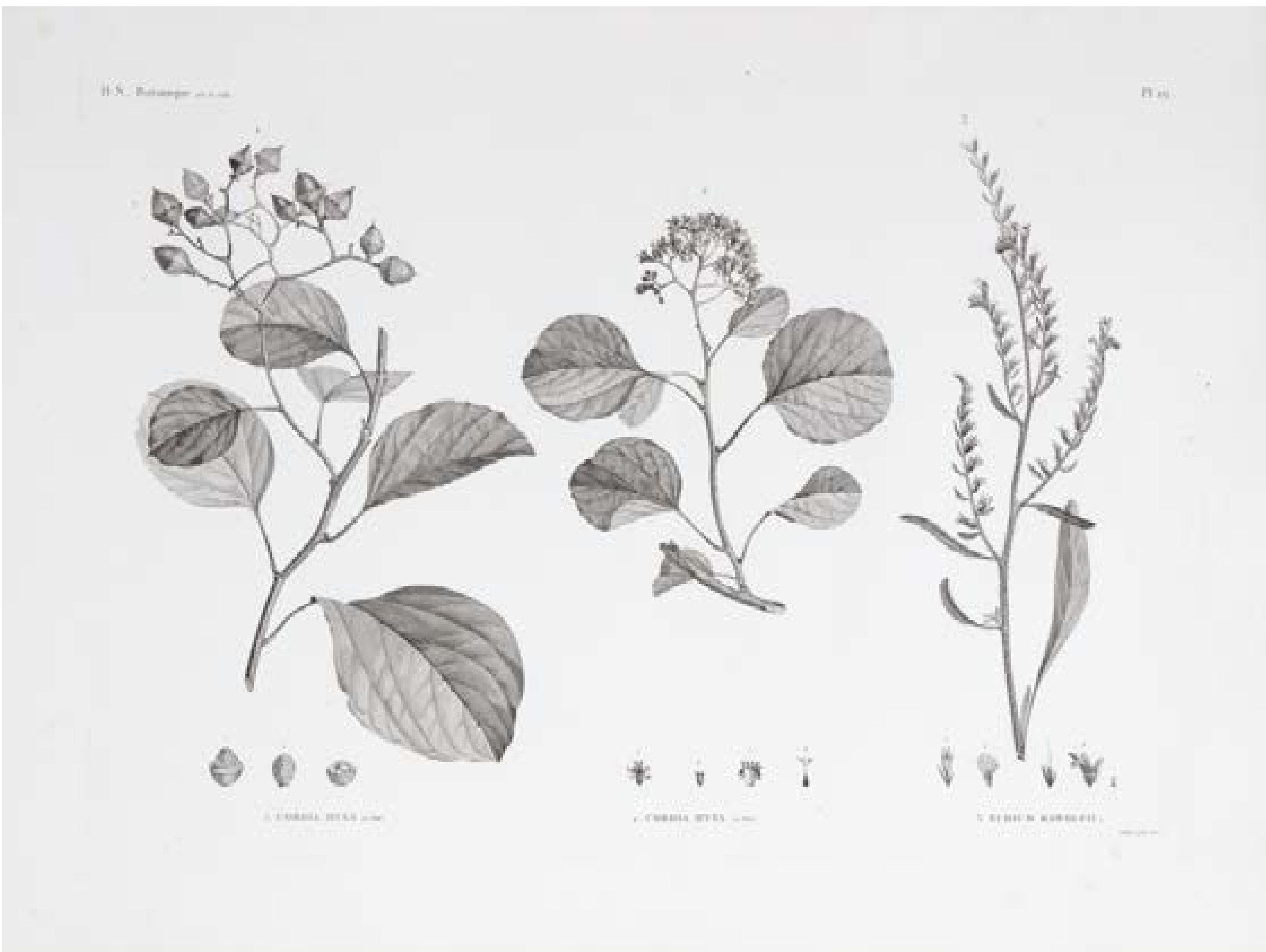
Botanique. Palmier Doum. Détails de la feuille et de la grappe.
Drawing: H. J. Redouté. Engraving: Allais. Plates. Natural History. Volume II. Plate 2.



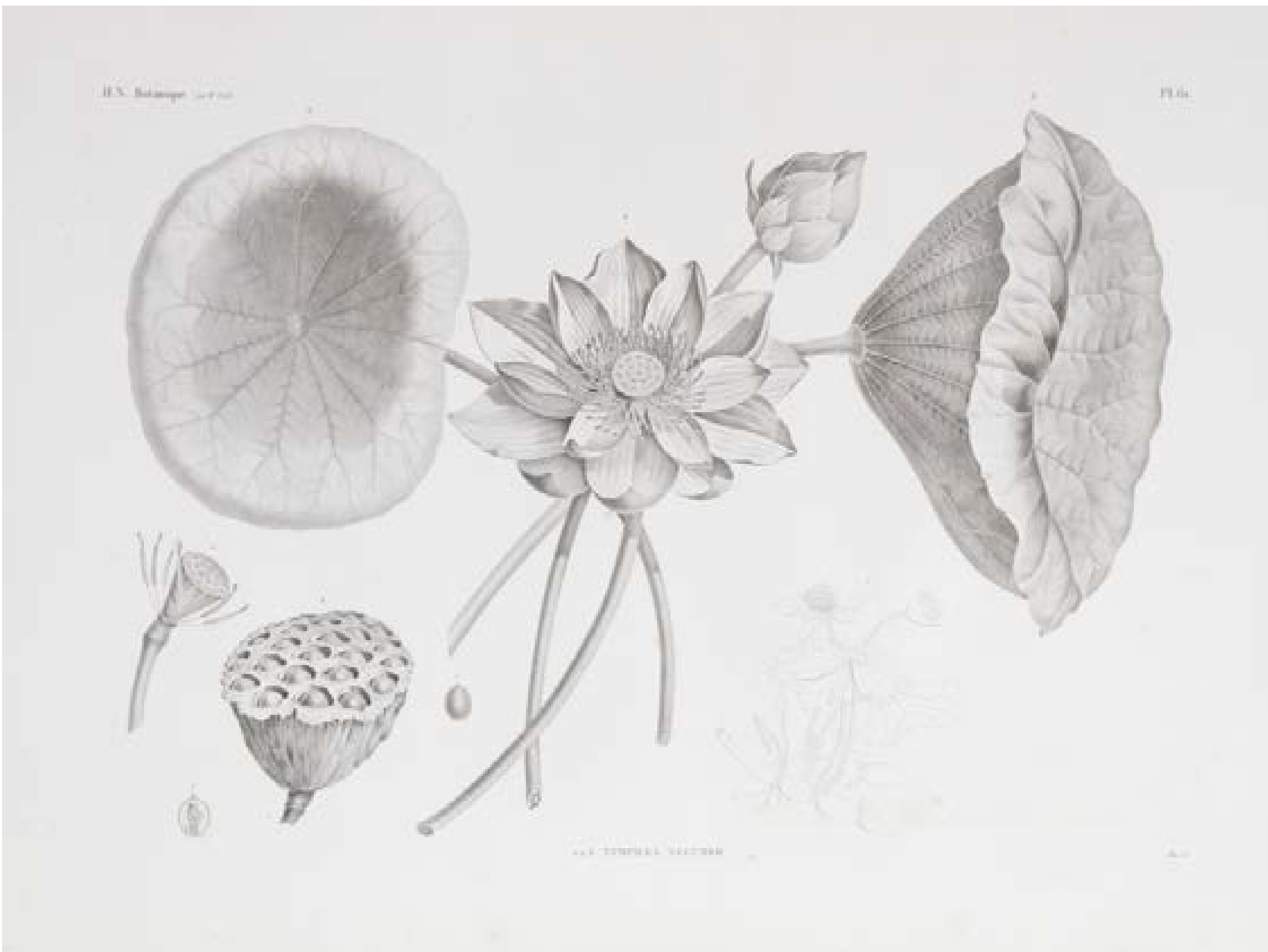
Botanique. 1 Erucaria Crassifolia. 2 Cochlearia Nilotica. 3 Buchnera Hermonthica.
Drawing: M. Delile. Engraving: Giajard fils. Plates. Natural History. Volume II. Plate 34.



Botanique. 1 Hedysarum Ptolemaicum. 2 Astragalus Longiflorus. 3 Astragalus Mareoticus.
Drawing: M. Delile. Engraving: Sellier pere. Plates. Natural History. Volume II. Plate 39.



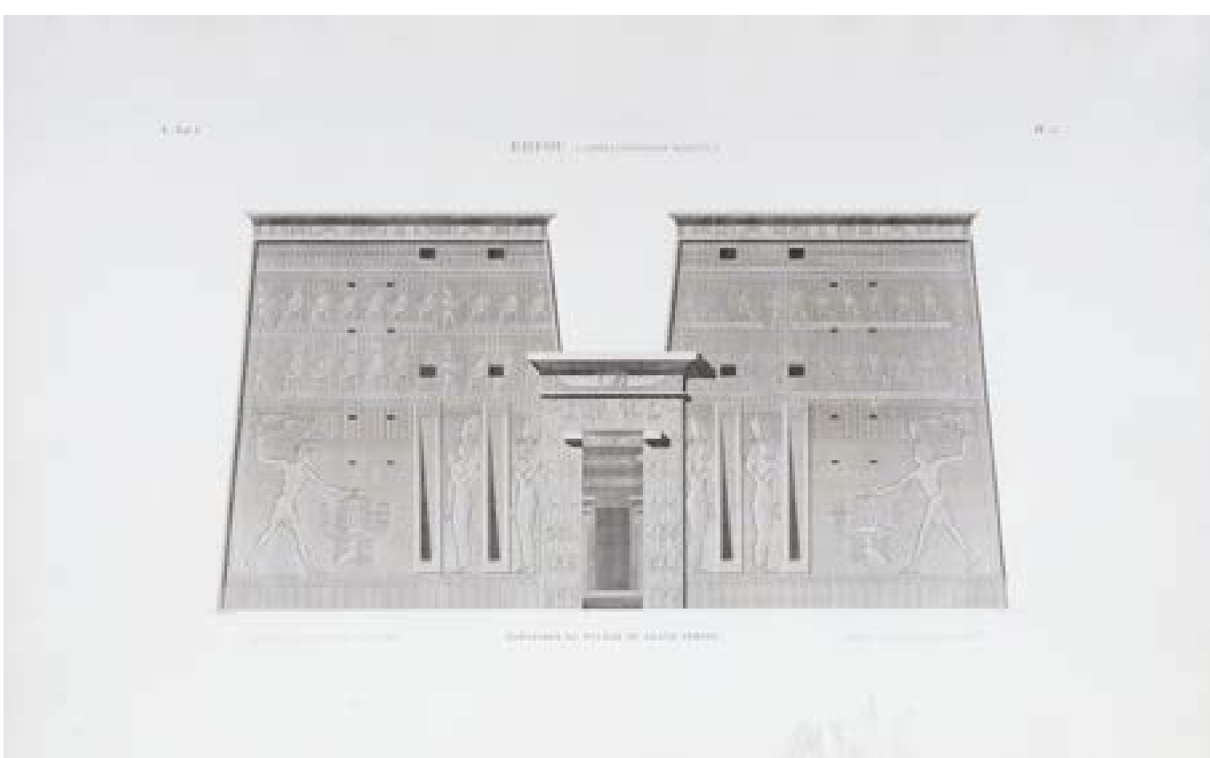
Botanique. 1 Cordia Myxa en fruit. 2 Cordia Myxa en fleur. 3 Echium Rawolph.
Drawing: M. Delile. Engraving: Sellier. Plates. Natural History. Volume II. Plate 19.



Botanique. 1. 2.3 Nymphaea Nelumbo. Drawing: M. Delile. Engraving: Plée.
Plates. Natural History. Volume II. Plate 61.

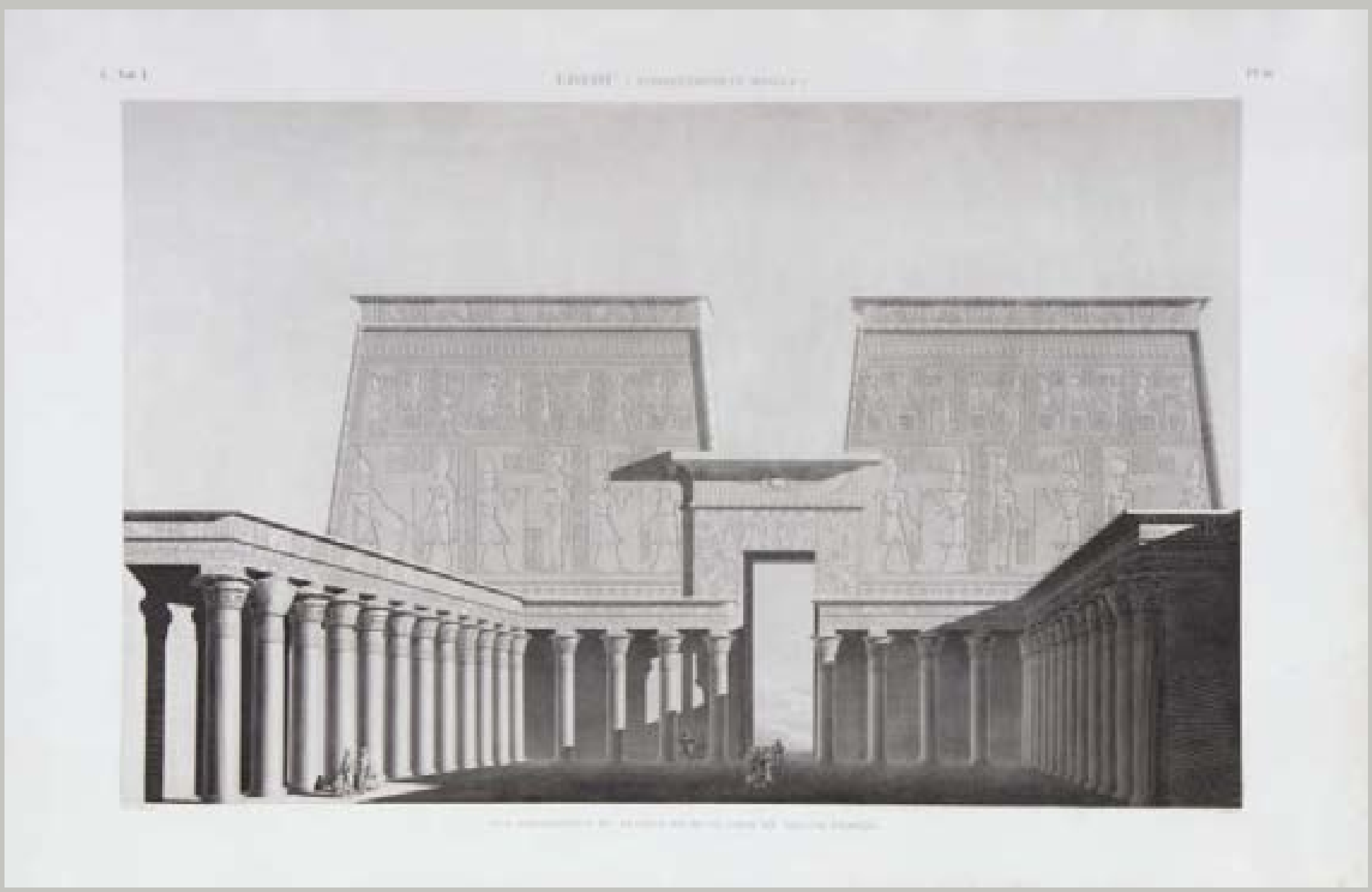
Edfou (Apollinopolis Magna). Vue du Grand Temple. Drawing: Dutertre. Engraving: Dutertre and Beaugean.
Plates. Mammoth. Antiquities. Volume I. Plate 49.

Thèbes. Medynet-Abou. Vue des propylés du temple et du pavillon, prise du côté du sud. Drawing: Cécile. Engraving: Lienard. Etching: Baugean. Plates. Mammoth. Antiquities. Volume I. Plate 4.



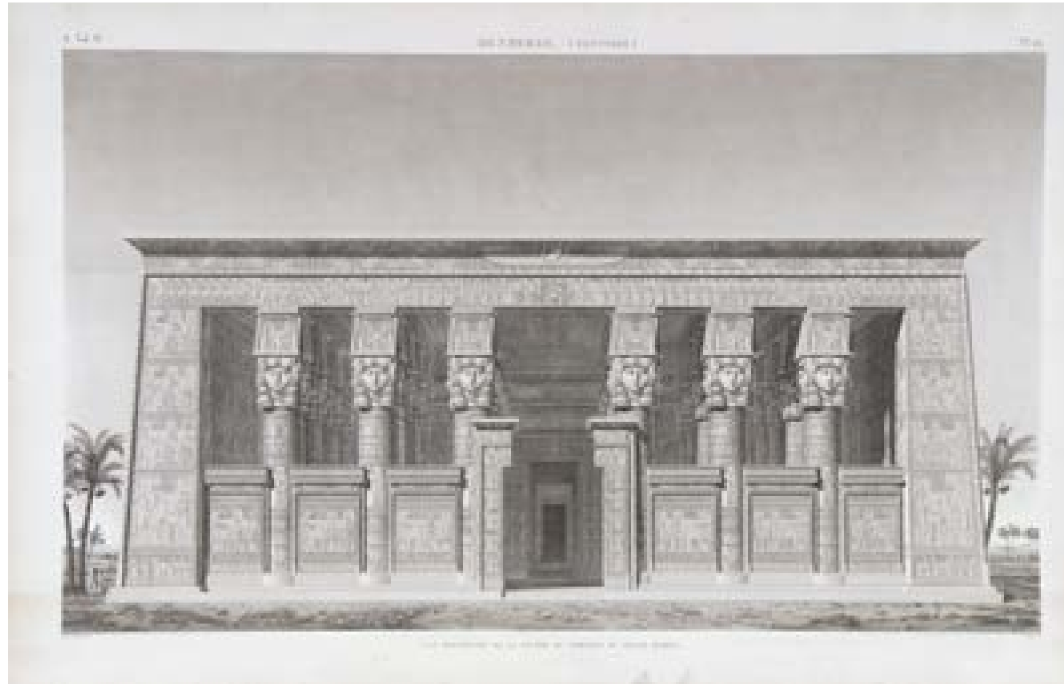
Edfou (Apollinopolis Magna). Élévation du pylône du Grand Temple. Drawing: Lepère. Engraving: Louvet. Plates. Mammoth. Antiquities. Volume I. Plate 51.

Île de Philae. Vue des monuments de l'île et des montagnes de granit qui l'environnent.
Drawing: Dutertre. Engraving: Dutertre and Baugean. Plates. Mammoth. Antiquities. Volume I. Plate 4.



Edfou (Apollinopolis Magna). Vue perspective du pylône et de la cour du Grand Temple.
Drawing: Jollois and Devilliers. Engraving: Sellier fils. Plates. Mammoth. Antiquities. Volume I. Plate 61.


DENDERAH.



Denderah. (Tentyris) Vue perspective de la façade du portique du Grand Temple.
Dibujo: Lepére Architecte. Grabado: Leisner. Planchas. Mamut. Antigüedades. Volumen IV. Plancha 29.

Thèbes. Karnak. Vue perspective du Palais prise de l'intérieur de la cour du côté de l'ouest.
Drawing: Lepére Architecte. Engraving: Sellier. Plates. Mammoth. Antiquities. Volume III. Plate 41.

Denderah. (Tentyris) Élévation perspective de la Porte du Nord.
Drawing: Chabrol and Jomard. Engraving: Bovinet and Sellier.
Plates. Mammoth. Antiquities. Volume IV. Plate 6.

Thèbes. Louqsor. Vue de l'entrée du palais. Drawing: Cécile. Engraving: Réville.
Plates. Mammoth. Antiquities. Volume III. Plate 3.

Thèbes. Karnak. Élévation perspective de la porte du sud. Drawing: Lancret y Duplessi-Bertaux. Engraving: Bovinet y Tessier. Plates. Mammoth. Antiquities. Volume III. Plate 51.

Pierre trouvée à Rosette, (Partie supérieure, en écriture Hiéroglyphique).
Drawing: M. Jomard. Engraving: Bigant.
Plates. Mammoth. Antiquities. Volume V. Plate 52.

Papyrus, hiéroglyphes, inscriptions et médailles. Pierre trouvée à Rosette,
(Partie intermédiaire, en langue Égyptienne vulgaire).
Drawing: Raffeneau Delile. Engraving: Fouquet.
Plates. Mammoth. Antiquities. Volume V. Plate 53.

Papyrus, hiéroglyphes, inscriptions et médailles. Pierre trouvée à Rosette,
(Partie inférieure en langue Grecque).
Drawing: Raffeneau Delile. Engraving: Miller and Allais.
Plates. Mammoth. Antiquities. Volume V. Plate 54.

Pyramides de Memphis. Vue générale des pyramides et du sphinx, prise au soleil couchant. Drawing: Balzac. Engraving: Baltard.
Plates. Mammoth. Antiquities. Volume V. Plate 8.

Pyramides de Memphis. Vue générale des pyramides, prise du sud-est. Drawing: Dutertre. Engraving: Beaugean.
Plates. Mammoth. Antiquities. Volume V. Plate 7.

HUNGER AND THIRST

Joan Fontcuberta

A physician by training, Charles-François Tiphaigne de La Roche (1722-1774) was a French writer whose utopian and counter-utopian novels fall into the two major schools of thought of the 18th century: rationalism and illuminism. They thus combine considerations of a scientific nature with cabalistic, magical or even hermetic considerations. Tiphaigne de La Roche was a visionary who anticipated numerous social and scientific inventions. In his work entitled *Giphantie* (1760) –an anagram of his own name– he describes photography almost seven decades before Nicéphore Niépce announced his discovery in 1827. In the narrative thread a hurricane transports the author to a place called Giphantie, a wonderful domain nestling in the heart of Africa inhabited by "elementary spirits". There the prefect of Giphantie shows our traveller a few of the advances achieved by his community, including among them the description of a procedure that fixes images produced by light: a canvas previously coated in a special substance captures and records the spectacle it is facing. After passing through a darkroom in which the coating solidifies, the result is an exact reproduction of the subject to which the canvas was exposed, as if a mirror had encapsulated its reflection with precision. Then both characters visit a gallery decorated with these "photographic" images, giving the guide the opportunity to propound a general vision of the history of the universe, of humanity and of the state of science. This is the passage that interests us:

> "Thou knowest that the rays of light, reflected from different bodies, make a picture and paint the bodies upon all polished surfaces, on the retina of the eye, for instance, on water, on glass. The elementary spirits have studied to fix these transient images: they have composed a most subtle matter, very viscous, and proper to harden and dry, by the help of which a picture is made in the twinkle of an eye. They do over this matter a piece of canvas, and hold it before the objects they have in mind to paint. The first effect of the canvas is that of a mirror; there are seen upon it all the bodies far and near, whose image the light can transmit. But what the glass cannot do, the canvas, by means of the viscous matter, retains the images. The mirror shows the objects exactly; but keeps none; our canvases show them with the same exactness, and retains them all. This impression of the images is made the first instant they are received on the canvas, which is immediately carried away into some dark place; an hour after, the subtle matter dries, and you have a picture so much the more valuable, as it cannot be imitated by art nor damaged by time. We take, in their purest source, in the luminous bodies, the colours which painters extract from different materials, and which time never fails to alter. The justness of the design, the truth of the expression, the gradation of the shades, the stronger or weaker strokes, the rules of perspective, all these we leave to nature, who, with a sure and never-erring hand, draws upon our canvases, images which deceive the eye, and make reason to doubt whether, what are called real objects, are not phantoms which impose upon the sight, the hearing, the feeling, and all the senses at once."[1]

1. Original paragraph in full: «Tu sais, lui dit-il, que les rayons de lumière réfléchis des différents corps font tableau et peignent les corps sur toutes les surfaces polies, sur la rétine de l'œil par exemple, sur l'eau, sur les glaces. Les esprits élémentaires ont cherché à fixer ces images passagères; ils ont composé une matière très-subtile, très-visqueuse et très-prompte à se dessécher et à se durcir, au moyen de laquelle un tableau est fait en un clin d'œil. Ils enduisent de cette matière une pièce de toile et la présentent aux objets qu'ils veulent peindre. Le premier effet de la toile est celui du miroir; on y voit tous les corps voisins et éloignés dont la lumière peut apporter l'image. Mais ce qu'une glace ne saurait faire, la toile, au moyen de son enduit visqueux retient les simulacres. Le miroir nous rend fidèlement les objets, mais n'en

We cannot know the extent to which Tiphaigne de La Roche pulled this idea out of the hat of a fertile intuition that also led him to predict things as varied as television and radio wave transmission, contact lenses, synthetic food capsules, pheromones as the activating agent of amorous attraction and the Big Bang, or whether, in the specific case of photography, it was a matter of having properly oriented antennae, allowing him to be tuned into the advances that were occurring in the field of photochemistry. In effect, throughout the 18th century there was an increase in experiences dealing with the sensitivity of different materials to light, something that had previously already caught the attention of the alchemists. Delving into the past, the blackening of silver nitrate had already been recorded by Count Albert von Bollstädt, who has gone down in history as Albertus Magnus (1193-1280). In 1565 Georg Fabricius (1516-1571) discovered silver chloride, known as *luna cornata*, although at the time it was thought to be the action of the air and not the sun that made silver salts blacken. For two centuries scholars debated the circumstances of that enigmatic reaction.

Robert Boyle (1627-1691) attributed it to environmental causes such as heat. But others with better judgment, such as Wilhelm Homberg (1652-1715), defended the hypothesis that the darkening was produced by the sun's rays. Doubt was dispelled in 1727 when Johann Heinrich Schulze, while attempting to repeat the experiment of Christoph Adolph Balduin to synthesise phosphors, discovered by chance that a flask with chalk impregnated in silver nitrate turned dark purple on the side where it was struck by the intense light from a window. Intrigued, he cut out some letters on an opaque paper, arranged them on this photosensitive preparation, repeated the conditions of the preceding situation and as a result found that the contour of the stencils was perfectly outlined on the chalk surface. Schulze called this find *scotophorus* or "carrier of darkness", as opposed to phosphor or "carrier of light"; in seeking a light-carrying material he had paradoxically found its opposite, a carrier of darkness.

The path opened up by Schulze was carried on through multiple investigations of increasing empirical weight. The next step was taken by the Swedish chemist Carl Wilhelm Scheele (1747-1786), who demonstrated that the darkening of the *luna cornata* was due to a process of reduction of the silver salts in metallic silver. He also discovered that this transformation was caused above all by the effect of ultraviolet radiations, which acted on the halides with far greater power than other frequencies of the visible spectrum. At the time all these trials were guided by scientific curiosity and did not yet foresee an application in the field of imaging. It would not be until a few years later that a physicist, mathematician and adventurer called Jacques-Alexandre-Cesar Charles (1746-1822) decided to continue Schulze's experiences. It occurred to him to subject to the action of the light a support he had previously bedaubed in silver salts, but doing this inside a camera obscura. His initiative has barely been annotated in canonical historiographies, but he could be considered the true inventor of photography, at least of the orthodox procedure to achieve it. Thanks to this process he managed to obtain silhouettes of objects and people, although he did not succeed in fixing them and making them durable. This was the technical hurdle which the pioneers were not yet equipped to overcome: the impressions produced were precarious and disappeared as the entire surface struck by ambient light gradually faded. What a pity that it never crossed the minds of these pioneers to go on holiday to Giphantie and steal the secret of the mysterious viscous substance!

Tiphaigne de La Roche's description obviously did not exactly prefigure the process of photography as we know it today, but of course the novel was conceived more as a work of fiction and fantasy than as a precise scientific prediction. The text elaborates on the fact that the image is captured by a photosensitive emulsion but omits the step of translating the object to projected image, that is to say, it obviates the imperative condition of the camera obscura as an optical device, to which would correspond half of a two-phase photographic procedure: taking and developing. But the wish to immortalise the fugitive reflection projected by the light was already rooted in the depths of human imagination, and this expectation prophesied that these dark boxes would allow images to be captured and reinstated at any moment. Insisting on that determination to fix images, we would have to then

garde aucun. Nos toiles ne les rendent pas moins fidèlement, mais les gardent tous. Cette impression des images est l'affaire du premier instant, la toile les reçoit. On l'ôte sur-le-champ on la place dans un endroit obscur. Une heure après, l'enduit est desséché et vous avez un tableau, d'autant plus précieux qu'aucun art ne peut en imiter la vérité, et que le temps ne peut en aucune manière l'endommager. Nous prenons dans leur source la plus pure, dans le corps de la lumière, les couleurs que les peintres tirent de différents matériaux que le temps ne manque jamais d'altérer. La précision du dessin, la variété de l'expression, les touches plus ou moins fortes, les variations des nuances, les règles de la perspective, nous abandonnons tout cela à la nature qui, avec cette marche sûre qui jamais ne se démentit, trace sur nos toiles des images qui en imposent aux yeux, et font douter à la raison si ce qu'on appelle réalités ne sont pas d'autres espèces de fantômes qui en imposent aux yeux, à l'ouïe, au toucher, à tous les sens à la fois.»

identify the experiences of Thomas Wedgwood (1771-1805) and Humphry Davy (1778-1829), who in 1802 published their findings connected with obtaining graphic recordings of objects arranged on paper or leather surfaces impregnated with silver salts. But in their case, too, the result very quickly vanished under light and they had to be observed in the strictest gloom. To arrive at photography as we know it today, the pioneers who succeeded Wedgwood and Davy only had to devise a method to fix and stabilise the prints created by light. In this endeavour, although Scheele had already anticipated that ammonia dissolved the residual photosensitive salts, the crucial contribution came from the astronomer John Herschel, who demonstrated the properties of sodium hyposulphite for dissolving silver halide not affected by light and therefore came up with the specific fixing agent that has remained current until the present day. From that moment on photogenic drawings or sun drawings could now be permanent, and the astonishment they caused stimulated research even more. Gradually other photosensitive products (resins, glues and varnishes) were found whose properties varied with exposure to light, opening up new possibilities for photographic processes.

The Era of the Enlightenment led to knowledge no longer based on dogma and prejudice but on reason and science, which in turn drove the systematic exploration of the world. Its mentality in cultural and ideological terms had a significant influence on the ideas that moulded modern western society and laid the foundations for the French Revolution and other 19th-century movements of political and social renewal. Enlightenment thinkers advocated the use of reason and logic as guides in decision-making and analysis. It promoted critical thinking and questioned entrenched traditions and beliefs that could not be justified through reason. Trust in scientific method and empirical observation as the means to acquire knowledge increased. Scientific and technological advances were viewed as veritable drivers of progress and improvements in human life. The philosopher Paul Feyerabend, a figure of epistemological anarchism, pointed out that the image of science and its technical innovations had been built, under the maxim of progress, as a fairytale where the success of science appeared as the result of a perfect combination of inventive and control, of ideas and method.[2] A direct example of this would be the fullness reached in the 18th century by scientific enlightenment, which played so crucial a role in the development of the visual representation of nature that it can be unreservedly stated that it lay the key foundations for the advent of photography.

Before photography was invented, scientists and artists depended on manual skill to capture and transmit the complexity of the organic world. They had to overcome the limitations of memory and the written word, which were the major pre-photographic ways of conveying information. The restricted capacity of human memory for storing specific details and the limitation of language for precisely describing the visual appearance of complex objects meant that illustration was essential. To this end they required precise and detailed records of specimens and natural phenomena. Both scientists and naturalists were aware of the importance of accurately representing the forms and structures of plants, animals and other objects of study. It is consequently quite obvious that the desire for a representation system that would technically simplify and automate that descriptive task should have emerged from the scientific community, particularly, in view of the multiple scientific expeditions embarked on as explorers and scholars started to travel to the planet's *terra incognita* and discovered new species and phenomena, when it became urgent to visually document the build-up of those findings and it became evident that the painstaking task of drawing and painting was becoming too slow and the results were always suspected to depend on the subjectiveness of the observer and to be prone to errors due to haste or lack of skill. Images allowed scientists to easily share their discoveries with colleagues and dilettantes from all over the world. The function of those graphic documents implied both the creation of an archival heritage and the availability of educational and dissemination tools. Visual representations helped to convey scientific concepts in an accessible manner, allowing the wider public to understand the diversity and complexity of nature. All these reasons contributed to the fact that photography was floating in the air, embedded in the eighteenth-century *zeitgeist*. Scientists longed for it and writers fantasised about it. Photography was born of that hunger and thirst.

We can thus consider the existence of a proto-photography, handmade photographs, images that were ideologically and functionally photographic but technically chirographic and handcrafted. And in this regard it is unjust that many of those glorious proto-photographers do not appear in the canonical annals of photography. In the field of botany alone, that pioneering pleiad included, to mention but a few, some indispensable authors: Maria Sibylla Merian (1647-1717), whose contributions to botanical illustration, despite her career having partly occurred in the 17th century, continued to have a decisive influence in the century that followed. Mark Catesby (1683- 1749), an English naturalist and

2. Paul Feyerabend. *Tratado contra el método (Against Method)*. Madrid, Tecnos, 1986.

illustrator, known for his work "The Natural History of Carolina, Florida, and the Bahama Islands", which includes detailed illustrations of North American plants, birds and fish. Georg Dionysius Ehret (1708-1770), who collaborated with several famous botanists of the time, such as Carl Linnaeus himself. José Celestino Mutis (1732-1808), a prominent Spanish physician and botanist who headed the Royal Botanic Expedition to New Granada. Pierre Bulliard (1742-1793), a French mycologist known for his contributions to the classification of fungi through his work "Herbier de la France". Sydney Parkinson (1745-1771), a British illustrator and naturalist who took part in James Cook's expedition to the Pacific on the ship Endeavour. Antonio José Cavanilles (1745-1804), botanist and taxonomist, director of Madrid's Royal Botanic Garden, with significant contributions to the illustration of numerous plant species, especially of Spanish flora. Some masterful illustrations of the native plants of the Iberian peninsula were also made by the artists Juan de Santander (1723-1800) and Hermenegildo Antonio Gines (1735-1800). And finally, closing this brief list is Pierre-Joseph Redouté (1759-1840), given the sobriquet "the Raphael of flowers" for his exquisite illustrations, particularly of roses.

When the cauldron of history reached boiling point, heliography and the daguerreotype appeared, finally fulfilling aspirations for a non-manual replica of the world. It is unsurprising that some of the earliest photographers, such as Anna Atkins, famous for her elegant cyanotypes of algae, came from the field of scientific illustration. But society was in the midst of the maelstrom of the industrial revolution and incipient capitalism and the scientific prescription assigned to the camera overlapped other mandates. As a consequence of its cultural and epistemological foundations, photography would be perceptively applied to the visual encyclopedisation of knowledge, acting as an instrument of veridiction and of archiving. But other effects were added to this: from an economic and political perspective, photography contributed to controlling the world by symbolically appropriating it and to visually formatting its new spatio-temporal models. Its development came in unison with the colonial expansion of the great powers: possessing the world in images signalled the preamble to its subsequent physical possession. Wherever the photographer placed his tripod, an army would later plant its flag. And from a spiritual or religious perspective, photography transcended finitude and death and aspired to magically supplant reality. This is why we still carry portraits of our loved ones in our wallets or place the faces of those who have left us on desks and shelves: photography invokes something that is absent and conjures their disappearance. The photographic image was ultimately destined to reveal the unreplaceable particularity of a life. This is why, for Giorgio Agamben, the angel of the end of time, the angel of the Apocalypse in John's Gospel, exactly coincided with the angel of photography[3].

It may be that this genealogy for understanding the origin of photography quenches an archaeological curiosity on communication and its mediums, but its greatest value consists of providing clues not so much on our current situation but on a near future. It is risible to pretend that those nineteenth-century values could have survived unscathed into the 21st century. Today we are faced with ferocious globalisation and the virtual economy. The capitalism of goods has been engulfed by a capitalism of images or, as suggested by Iván de la Nuez, by an iconocracy: by the tyranny that images exert over us, relegating us from sovereigns to subjects. We inhabit a hyper-modern society marked by consumerism, quantification, excess and urgency. A society where the accent is no longer on breaking up with the values of modernity but rather on exacerbating them. We discover the world through digital screens that give us access to a fluid and complex reality under surveillance. The internet, social media, mobile telephones, surveillance cameras and all forms of graphic recording devices generate an oversaturation in which images are no longer submissive mediations between the world and us and instead become active and furious. The paradox is that we no longer take photos to look at them; we are stifled by images that almost nobody sees, and then other values for the photographic act start to prevail, for example connectivity and communication. Post-photography thus announces a society that relegates facts to post-truth and loses memory to gain interaction.

Science fiction foretells a world made of screens, physical or immaterial, which we access via a mental interface, providing us with multisensory holographic representations from every perspective. While this future of hyper-visibility is being consolidated, post-photography predisposes us to a world of disembodied, unsupported, ubiquitous images . It is obvious that photography is no longer just "writing of light" exercised by a few privileged scribes, the heirs of the scientific illustrators, but has become a universal language that we all

3. Commenting on one of history's earliest daguerreotypes, *Boulevard du Temple* (1838), taken by Daguerre himself from the window of his studio and showing the busy urban thoroughfare as if it were a desolate and spectral landscape because the lengthy exposure did not manage to fix the figure of any passer-by with the exception of a shoe shiner and his client, the Italian philosopher wrote: "I could never have invented a more adequate image of the Last Judgment. The crowd of humans – indeed all of humanity– is present, but it cannot be seen, because the judgment concerns a single person, a single life: precisely this one and no other. And when has that life, that person, been picked out, captured, immortalised by the Angel of the Last Judgment, who is also the angel of photography?"

use unaffectedly in the various creases of the everyday. But that universality and the excess it entails demands a toll from what has been the ideological scaffolding of photography: we enter new regimens of truth and of memory. The uncertainty regarding the documental value of post-photographic images has been abundantly dealt with: the camera has brazenly relinquished its power of conviction. Memory, too, is affected. If photochemical photography was associated with elephant memory, post-photography embodies the precarious memory of fish, which apparently lasts for only a few seconds. The great paradigm of this "fish memory" is Snapchat, an application which is all the rage among the young and in which the messages received, whether photos or videos, are automatically erased after ten seconds. It is the ecstasy of the present in detriment of the past: a present in suspension, made everlasting, which is the no-man's land between the horizon of experiences and that of expectations. Post-photography replaces the memory of the past with the nostalgia of the present.

We are today witnessing the irruption of artificial intelligence in all areas of life and the image generation systems based on deep-learning neural networks are revolutionising the landscape of visual communication. The revolution is as great or greater as the spread of the daguerreotype in 1839: the Parisian public felt as if they were watching magic or a miracle; the incredible was happening; mirrors retained a reflection forever, fulfilling the auguries of Tiphaigne de La Roche. No one understood how this trick was possible but one had to yield to the evidence when watching it before one's eyes. Today something similar is happening, perhaps multiplied by the future repercussions which we are still unable to calibrate: algorithmic photography can plausibly fulfil any wish and this causes as much astonishment as alarm. The guild of painters conspired against the daguerreotype, seeing it as a threat to their monopoly. This is why photographers were expelled from the sacrosanct art salons while a narrative was cemented according to which artistic expression was incompatible with the use of technique and machines. It is no paradox that the same, more or less updated reasoning is being repeated today. Many sectors have risen up against the images created through AI technology, sometimes with well-founded objections and others with the fears resulting from ignorance of tools that we have not had time to assimilate. We would be well-advised to start learning how they work and to give them time so that, as occurred with photography in the 19th century, they find an accommodation that benefits our needs.

But beyond any ethical, economic and political horizons that the future of AI holds for us, it is worth our while to recapitulate. 18th-century scientific illustration paved the way for the emergence of photography as much as photography has paved the way for the emergence of algorithmic images. To this end it has been necessary for the extraordinarily widespread growth of images to occur that is almost suffocating us today but which deep down is only continuing and intensifying the drive to accumulate and classify that was undertaken by eugenics. Galton, Bertillon and Lombroso understood that the interaction between photography, archives and statistics transcended the culture of truth to open the way to a culture of prediction. AI does nothing but offer us the climax of that culture of prediction: it is a matter of processing a vast quantity of visual forms associated to their description in a natural language in order to anticipate new forms. It thus operates with a colossal memory of iconic tabs arranged according to categories. For example, the flower category: orchids, roses, hydrangeas, tulips, daffodils, chrysanthemums, etc. Each flower has a specific formal appearance but there is a structure with common patterns, an "idea" in the Platonic sense, which gives the whole its identity. An algorithm may generate non-existent "real" flowers (for example orchids or tulips true to their generic identity) but it is also capable of operating in the latent spaces between one flower and another, for example from an orchid to a tulip, and invent perfectly convincing floral morphologies that do not exist in nature. Furthermore these morphologies, to further gild the lily, can be represented in our preferred visual style, like that of Walter Hood Fitch drawing the orchids that James Bateman collected in Mexico and Guatemala or that of Karl Blossfeldt or that of National Geographic's *Wildlife Photo Gallery,* because styles are also contingent to discernible stylemes that can be learned by algorithms. With one click I can transform Fitch's paintings into photographs in my own style.

Photography is no longer made with light but with data. Dating from 1928, *Elogio de la mentira (In Praise of Lies)* is the principal work of Josep Torres Tribó, a thinker of libertarian affiliation who was murdered in a Nazi extermination camp. In debt to Nietzsche's philosophy of suspicion, Torres Tribó advocated lies in an extra-moral sense, the anti-dogmatic expression of freedom that would transcend the mere transcription of what is real and would be manifested in language and in artistic creation. An enthusiast of technology, Torres Tribó predicted that when machines replace humans in life's basic functions we will finally have attained the horizon that will lead to our full spiritual development. Now that we can concentrate on intentions, ideas and concepts, making images is relegated to programmed automatisms for absorbing all preceding visual culture while awaiting our instructions. If the yearning for precision and exactness of the Enlightenment made a promised land of photography, from our current vantage point that promised land looks like a mere transit station, because it may be that this genealogy of images will culminate in a stage in which freedom of creation without further limits than one's one inventive will make of AI not a mere promised land but the true paradise within our reach.

[Rafael Levenfeld *in memoriam*]

THE CORSET, KANT AND PHOTOGRAPHY

Manolo Laguillo

"The historical subject does not allow a clear allocation of intellectual factors and material conditions - for example according to the scheme of substructure and superstructure, of reason and consequence, of design and realization."

Hans Blumenberg,
Historia del espíritu de la técnica[1]

I.

Today we can describe the world fundamentally in two ways, through language or with images, and we have trouble remembering that, until not that long ago, the idea predominated that the word was superior to the image[2]. Thus, in the 17th century, when it was still difficult, expensive and infrequent to print a long text with images to illustrate it, the description was explained, in most cases obviously verbally, like a 'less exact' definition, for "it provides some knowledge of a thing by the accidents inherent to it and which sufficiently determine it to give us some idea that distinguishes it from others"[3]. The description is a 'less exact' definition because the actual definition defines the limits and is 'exact'. That the descriptions can be by means of images is not even mentioned, even though they already existed: the rising fame of the book published by Vesalius in 1543 (*De Humani Corporis Fabrica*) was due to its engravings.

It is striking to see how much this notion of the verbal description –which is a 'less exact' definition because it focuses on accidents– foresees what will be done a century later, and not with words but through images, the plates that illustrate Diderot's *Encyclopédie*. It also anticipates the type of description made from 1839 onwards by photography[4].

In our days this old distinction between defining and describing –always through words– has lost its currency and seems contrived to us. Today a well-done image of something serves us to both define and describe it, and the credit we give the visual aspect is considerable. We have also internalised this reliance despite it being so recent, to the extent that we easily forget that it did not always exist. At its birth and development, from the 17th and 18th centuries onwards, photography had a fundamental role. In the couple of centuries elapsed between then and now we have learned to trust the senses, so we also trust that by-product of vision that is photography.

II.

Is it right to compare the description made up of words with the one provided by an image? What is more: is an image-

1. «Der historische Gegenstand lässt eine eindeutige Zuordnung geistiger Faktoren und materieller Zustände – etwa nach dem Schema von Unterbau und Überbau, von Grund und Folge, von Entwurf und Realisation – nicht zu.» Hans Blumenberg, *Geistesgeschichte der Technik*. Frankfurt / M. 2009. Pg. 44 .

2.'To describe' contains a reference to the written word. In German this is also clear, for *beschreiben* is generated by the simple addition to the verb *schreiben* –'to write'– of the prefix *be-*, which is equivalent to 'de-' in Spanish, French, English or Italian. The meaning of circumvention that these prefixes possess appears clearly in the Greek word for description: 'περιγραφή', circumlocution. The action of writing, of drawing the letters, is done with everything, employing gestures no different to those used when drawing.

3. The philosophy of the time distinguished between the essence –one's own, necessary and constant– and the accident–fortuitous and contingent. A thing is what it is for its essence, not its accidents.

4. But because in it the accidental overlaps the essential, today we still prefer to employ drawings and not photographs to illustrate, for example, a book on botany: photography reproduces that particular oak, with all its specific details; instead, the drawing represents the generic oak.

description a true description? Both image and word are valid because they refer to reality, because they have to do with it. It is represented in its current state –the present, but also the one it had –the past– and, even, the one it will have –the future. The image only replicates the present reality, but in return it provides us with details that escape words. The relationship which words maintain with images is thus so complicated and difficult that there are times when it becomes impossible, just like when human beings cannot find a way to understand each other.

In the schools of rhetoric of Greece and Rome they practiced an exercise, *ekphrasis*, which consisted in describing, without having it in front of you, an artistic piece known to all. One of the best-known is in canto XVIII of the Iliad. It tells of the visit made by Thetis, the mother of Achilles, to the lame Hephaestus to ask him to make her son a shield, a helmet, greaves and cuirass. The *ekphrasis* of the shield, which takes up the last part of the poem, repeats, retracing it, the progress of its construction, including the scenes created by the smith on its surface, so that at its end, when we finish reading it and see the finished shield with the eyes of the imagination, we suddenly understand that what the blacksmith god has made is the Earth with its settlers: "Thus the broad shield complete the artist crown'd / With his last hand, and pour'd the ocean round: In living silver seem'd the waves to roll / And beat the buckler's verge, and bound the whole." [transl. Alexander Pope]

For the image to 'count', it has to be accompanied by words, so that, in reality, it is they, the words of that canto XVIII, *ekphrasis* of the images, which narrate the actions of the personages inscribed by Hephaestus on the shield.

III.

The vast bibliography on the Enlightenment and the 18th century pays little attention to the image and its undeniable importance. Most authors dealing with this era focus above all on the great concepts: freedom, human rights, privileges, equality, emancipation, rational thought, empiricism, scientific method... all of them notions that are ultimately sustained by texts. In line with this primacy of the allegorical and ideological image –in the literal sense of 'enlightenment of ideas'– the same *canon* of works of art[5] tends to be mentioned, and there are few or no references to the plates of *L'Encyclopédie* –to which Diderot devoted much of his effort as editor– or to the engravings of the engineers or the splendid engravings of the *Description de l'Égypte*. The visual aspect already existed, in the broad sense in which we understand it today, but the ordinary history of art barely considers it[6].

Perhaps this is because the only manner, suitable to its being, of paying attention to the visual aspect is to reproduce the images that sustain it; and if this is unachievable for technical reasons, there is no choice but to limit oneself to mentioning them. To describe them with words, to do their *ekphrasis*, is out of place because, just like detail escapes language, they are untranslatable into text. But it is precisely their detail which gives verisimilitude to the images of these decades[7]. Their contemporaries –as we do now– thought that they were real, that they are exactly and precisely in keeping with reality, because minutiae cannot be invented. They provide these images with a new kind of value as faithful substitutions of reality; thanks to them we can study reality without having it in front of us, 'in absence': images represent it.

But to give an account of the minutiae, you need a firm hand and a sharp eye, coordinated by the mind in a continuous and pleasurable exercise that, I would venture to say, excludes the verbal. It may be necessary to consider that there is something like 'visual thought', that those who write books are basically 'verbal', and those who illustrate them are 'visual'. How else would you explain the relative lack of skill with words that sometimes characterises highly visual people?

The latest research on autism force us to take into account the possibility of 'thought in images'. The case of the autist Temple Grandin, who aroused the interest of Oliver Sacks[8], forces us to ask ourselves whether it might not be 'visual thinking' that best addresses mechanical problems. Grandin designs machines and devices to facilitate the movement of livestock on a farm because she is capable of placing herself in

5. In the relatively recent (1993) *History of Art* directed by Juan Antonio Ramírez, in the chapter on the Enlightenment, its author, Valeriano Bozal, shows paintings, drawings and engravings by David, Anne-Louis Girodet, Gainsborough, Goya, Fragonard, Constable, Tiepolo, Hogarth, Chardin, Wright of Derby, Reynolds, Piranesi, Füssli, and Blake.

6. It is perhaps the so-called cultural studies that have most contributed, because they void the distinction between high and low culture, to thinking of the visual in general and of the photographic in particular in other ways. *Notes on 'Camp'* by Susan Sontag dates from 1966.

7. The huge size of the volume of the imperial edition that shows a reproduction of the Rosetta Stone is due to the wish to keep the scale at 1:1 so that the image contains the full original details and can be used in research. That this is the intention is demonstrated by the fact that it occupies three plates in volume I of Antiquities in *Mammouth* folio, whose sheet size is 109 x 71 cm. Each plate is devoted to one of the languages of the stone's inscription: one for the hieroglyphs, another for demotic language and the third one for Greek.

8. *Thinking in Pictures. My Life with Autism*, the book in which Grandin tells of her experiences, dates from 1995, and it was not translated into Spanish until 2006. Oliver Sacks writes about her in *An Anthropologist in Mars. Seven Paradoxical Tales* (1995), whose translation into Spanish is from 1997.

the world by adopting the point of view of animals. But 'visual thinking' is not exclusive to our days. An interesting case of mechanical engineering in the Ancien Régime is the improvement of a nautical clock made in the first half of the 18th century by John Harrison, which made it possible to exactly determine longitude in navigation and thus gave naval hegemony to the English navy. Obviously we cannot know whether or not Harrison was an autist.

An equally fantastic example of the effectiveness of 'visual thinking' is the deciphering of Egyptian hieroglyphs, a process initiated exactly 202 years ago, in 1822, with Champollion's publication of one of the first successful results reached through the hypothesis that it was basically ideographic yet phonetic writing as well. His work was based on the stone which Napoleon's army had discovered in 1799 in Rosetta, a town on the Nile Delta. And although the stone soon ended up in the hands of the English –today it is in the British Museum– Champollion was able to work on the inscriptions in Greek and in demotic language, for as soon as the stone was brought to light, copies were made of it. This foundational moment of Egyptology, which is also a milestone in the modern attitude to reality, could be understood in symbolic terms, for Champollion resolved the problems thanks to having understood the notion of reading transcending the strict limits that the Ancien Régime had in its idea of language or, in other words, thanks to having deactivated the cultural implicitness from its historical moment, which placed language at the apex, above images. The enormously detailed and therefore exact plates of *L'Encyclopédie*, whose publication had been concluded in 1780, must have contributed to the image rising in the general consideration to be situated at a level comparable to the word.

We cannot forget Thomas Young in this context. In fact, the merits of this scientist, physician, linguist... are greater than those of Champollion. His prodigious calligraphic skill –the special training he underwent in his youth in eye-hand-brain coordination, copying Greek manuscripts, which he later applied to papyrus scrolls with texts in Latin and Greek found in the ruins of Herculaneum– is behind the fact that he could reach a series of conclusions based on the Rosetta Stone. When copying the text in demotic script he became aware of the formal likeness between some of those characters and others in hieroglyphic writing. This is how he expressed it: "The immense advantage that is obtained by the complete sifting of every letter, which the mind involuntarily performs, while the hand is occupied in tracing it." It is very likely that Thomas Young was eminently visual.[9]

IV.

The emergence of photography tends to be explained by two apparently contradictory theories. The transgressive theory says that photography launched an era that would radically differ from the preceding one. There is a turning point, and things will never again be what they were before the birth, in the first half of the 19th century, of this mechanical means of reproducing and representing the world. Photography shows unsuspected aspects of reality, and the speed and ease with which it allows us to take images involves a qualitative change. The continuist theory, however, states that the pre-photographic era is not much different from the photographic one given that many of the characteristics of the latter have clearly and emphatically been in existence since the late 18th century, when we were still half a century from the invention of Talbot, Niépce and Daguerre. So in the 18th century there is already the notion that it is legitimate to observe the world from an individual viewpoint and subjectivity is a given: by something that Kant distinguishes between the 'thing-in-itself' and the 'thing-for-me'. Industrialisation began in England around 1750: interchangeable parts for muskets date from 1785[10]. And the homogenisation that quickly came to dominate in the 19th century –think, for example, of the unification of time thanks to the railroads– was already announced and prepared in the previous century: the implementation in France of the decimal metric system occurred in 1790. Reading became widespread in the late 18th century and the world, the far but also the close one, started to be within the reach of a curiosity that had become multitudinous, far beyond the narrow scope of the *savants* and a few chosen ones. Photography did not burst on the scene with wanting to see things, a wish to reproduce, represent and explain them that did not exist before.

In reality both conceptions are right, and the difference between them is due to the fact that they focus on different aspects by adopting different distances from the issue at hand. The context of photography's birth is the culture of the late 18th and early 19th centuries, but in the broadest possible meaning of 'culture'. We owe to the historiography of recent decades,

9. Cf. A. Robinson, *Thomas Young. The last man who knew everything*. Oxford 2006. Pages 154-155. This fascinating topic –the connection between gesture, stroke, sign, word and image– not only transcends the framework of this text; it also puts in a predicament the capacity of whoever writes about it.

10. The publication of *Empire of Guns. The Violent Making of the Industrial Revolution*, by the historian Priya Satia, is very recent (2018). This work sets out something unheard-of: the direct connection between arms production and the Industrial Revolution.

influenced by sociology, ethnography, anthropology, etc. that in investigating any historical issue we now include a material culture that, precisely for being so obvious, has tended to be disregarded: attire, manners, food, sounds, smells, gestures...

And so, if we focus on the issue of the individual, subjective, particular point of view, on the fact that photography enthrones it, it is obvious that there is a direct connection between the path, the manner of travelling adopted by the subject, and the different points of view which he ultimately adopts. On these points of view depends what presents itself before his eyes, and only subject to this can he reach the point of wanting to photograph it. He will not be able to decide whether something is interesting until he sees it from the point of view that makes it interesting. But for this he has to be able to arrive at that point of view, he has to be able to get his body to that point.

Let us therefore take a look at what happens to European bodies in the course of the 18th century. From 1740–1750 onwards there are signs that a trend is starting towards liberating them. The clearest indicator is that the corset is starting to be used less and less. This was a kind of exoskeleton, a prosthesis, imposed on middle- and upper-class children to force them to adopt an upright, 'correct' posture and on women so that their silhouette would fit in with a certain ideal. During those years this external 'rule' –the materialisation, in an object, of a social norm– was replaced by an internal one, the one dictated by one's own muscle 'tone'. A new concept appears, fibre, the point being that it holds up, that it possesses hardness. Cold is the external agent that propitiates this, and so it unseats heat. We go from the old theory of humours –Galen– to that of tensions and excitation[11], to the modern medical conception: the leap from the notion of 'fibre'[12] to that of 'weave' and 'histology' is around the corner. It is also at this time that the idea is invented of physical, corporal, medicinal education, that health is susceptible of being encouraged[13].

Thirty years later, already in the reign of Louis XVI but still well before the Revolution, loose and sheer garments have come into fashion, allowing for far more 'natural' movement, to utilise a word already in use at the time. "The obsession with antiquity liberates women from the corsets and whalebone into which she was squeezed; the bending of the kidneys disappears; light and sheer frocks imitate the draping of the chlamys mantles."[14]

As soon as the corset ceased to be used, mobility became freer and more natural. At the same time, this circumstance led to a modification in the criteria that governed correct and incorrect posture. The enlightened mentality, moreover, was disseminating the conception that individual points of view are legitimate. This defused the Ancien Régime's idea of the sole point of view, that of the prince, as exemplified in the fan-shaped plan of the baroque city of Karlsruhe (1715), with the ducal palace situated at the centre of its thirty-two paths, or the spatial organisation of theatres, where the best place is the royal box, at the axis of symmetry of the hall. I cannot fail to establish a nexus between this set of factors and the Kantian notion of the categorical imperative: the subject, without external imposition, must act according to the moral law he feels inside of himself and which, as he necessarily follows the dictates of reason, has universal validity: 'treat others as you would like to be treated by them'.

Photography, ultimately, allows us to start talking, if I may be allowed the neologism, of aspectivity. While in the classical epoch things possessed one sole aspect because there could only be one point of view, with photography the one became many. Aspectivity thus goes hand in hand with the conviction that subjectiveness is legitimate[15]. And the path, which is needed to grasp the different points of view –identifiable in the system of coordinates invented by Descartes in the 17th century to define any point in space– occurs in time, in the fourth dimension. The images generated from this exacerbated subjectivism are unsurprising because the mentality that can accept them was in existence long before the technical procedure was invented.

The trend towards liberating the body now runs parallel to another one in the opposite direction, one which mechanises and fits it into a standard. In 1743 the Regulations for the Prussian Infantry appeared. It breaks up actions into times, which the soldiers practice in the course of regular instruction sessions. The objective is that the official's commands –shoulder arms, rest, aim, etc.– cause an automatic reaction in the group of soldiers so that in battle they will act as a single,

11. Cf. *Histoire du corps II De la Révolution à la Grande Guerre. A. Corbin, J-J. Courtine, G. Vigarello.* Published in Spanish in Madrid, 2005. Pages 276-277.

12. Significantly, the term 'fibre' started to be used in the mid-18th century and appeared for the first time in 1767 in a dictionary, by the Jesuit Esteban de Terreros: "FIBRE, a term in Anatomy, a certain compound of filaments from which the membranes, the muscles are interwoven. Fr. *Fibre*. Lat and It. *Fibra*."

13. The chronology at the end of this text features some of the most important discoveries associated with the body and with corporality.

14. Jean Starobinski, *1789. Los emblemas de la razón (The Emblems of Reason)*. Madrid, 1988. pg. 153.

15. The subject's prominence was already present in 'I think, therefore I am' formulated by Descartes around 1637 in Holland, where he found refuge. The subject is constituted in pure thinking, independent from any external constraint.

unthinking body. The Prussian army's higher speed and effectiveness in combat led the rest of the countries to copy these regulations and their idea of breaking down movements into times.

Napoleon, the supreme example of a hyperactive individual, legitimated through his action the individual, subjective point of view. Napoleon won battles because he did not follow rules, because he broke them: he moved troops at night, moved forward in unconventional ways, etc. And while his strategy caught the enemy by surprise, a time came when that enemy came to anticipate it, and he started to lose battles. On Christmas Eve 1800, the year of the coup d'état of 18 Brumaire that transformed him into the *de facto* sovereign, Napoleon was left unscathed by an attack when heading for the premiere in Paris of Haydn's *Creation*[16]. Napoleon's narcissism launched the contemporary world.

V.

I would like to see 19th-century photographs like their contemporaries saw them, that is to say, to go back 150 years, removing the traces of everything occurred since then until now. I do not want to time travel as suggested by the novels and films that fantasise about the idea of a machine that transports the traveller without altering him. Instead I would like to imagine how they felt, wanted, perceived and thought then, retrace my steps to marvel at what they marvelled at and which, transposed to the present day, would leave us unmoved. And even though I cannot realise this wish of putting myself in that time, this does not mean I don't wish to formulate it, for this forces me to detect what we consider to be implicit and to identify what they considered to be such at that time. To become aware that the common substrate of what is implicit has varied is fundamental in deactivating my projection on the past. The effort of putting my 'implicits' between brackets brings me a little closer to the intention of those who were taking photographs then, and I can then better understand what they were looking for. I propose to replace the documental value that those photographs have for us with the documental value they possessed when they were taken a century and a half ago. What they say now is not what they said then because our eyes are not like the ones that gazed upon them when they were still new.

I will suggest two examples, both of them based on what is most apparent, clothing. I will start with the most recent. In the 1920s and 30s it was a given that men would wear a tie. This item did not yet have the connotations it started to acquire in the 1960s. So we should not be surprised that the Dadaists, one of the most deliberately anti-conventional groups of those years, mostly appeared wearing a tie. So it is a rarity to see the portrait taken by August Sander in 1928 of one of them, Raoul Hausmann, showing him barefooted, dressed in wide trousers, naked from the waist up and with a monocle. If this exceptionality shocks us now, it must have been doubly startling then because it expresses a wish to provoke. In effect, there is another portrait of Hausmann properly dressed with a tie. The second example is from the mid-19th century. In this well-known photograph we see one of the great engineers of the time, Isambard Kingdom Brunel, posing against a background of chains. He is standing, wearing a top hat and with a cigar in his mouth, looking to the right. There is a striking contrast between the impeccable garments he is wearing from the waist up –frock coat, waistcoat, white shirt with collar and a kind of cravat– and the wrinkled trousers. Our surprise is mitigated when we realise that, since they were not reinforced like a jacket and there were no artificial fibres available yet, it was normal for trousers to become wrinkled. To prevent this, each trouser leg would be tautened by means of a strip of fabric passed underneath the foot.

And so we return to the major characteristic of photography, the detail. Its use in the 19th century experienced fluctuations, for it tended to be avoided when a more lyrical than epic approach to reality was preferred. In other words, when the photographer wished to allude to what he might be feeling when confronted with something; when it was a matter of describing not the outside but the inside.

In photography the detail exists by default, automatically, without the intervention of the operator's will. This is why all the details appear and reality is represented in all its wealth of textures, surfaces and materials. There is no hierarchy in the degree of importance, everything has the same value. What is quotidian and normal for contemporaries and, for being so, might perhaps be despised by the painter, who would not lower himself to represent it (says Talbot, as we shall soon see), in the photograph it is shown and stands out for those of us who view it a century later.

The difference between how people viewed then and how we view now is explained by the obvious fact that our material and immaterial culture has hugely distanced itself from what it was then. Our ways of placing ourselves in time and space –

16. This oratorio, one of the last works of the Austrian composer, fully expressed the ideas of Illuminism. In the last bars of the introduction, which is entitled 'The Representation of Chaos' in the score, it is the choir that sings the words *es werde Licht*, let there be light. The metaphorical power of *The Creation* quickly led to its great success, as demonstrated by the many times it was performed throughout Europe in the years that followed.

the way we value haste, punctuality, simultaneousness, speed, our ideas about hygiene, health, comfort, privacy or modesty, our notions of narration and authorship, have very little to do with those of the mid-19th century. Those, in turn, were also far distant from those of the mid-18th century. We may be helped in following the leap from the seventeen-hundreds to the eighteen-hundreds by the example of music. In the Ancien Régime music was understood to be essentially tied to the verbal discourse. Music, whose ultimate objective was to move us in our affections, was a kind of declamation that obeyed the laws of rhetoric. But this did not pose any problem of intelligibility given that both the performers and the public knew it. Instead, in the gallant style of the second half of the 18th century –the Mannheim school– it is no longer a question of the audience 'understanding'; they only need to 'feel'.[17] From that moment on the common substrate implicit in the theory of affections and classic rhetoric would gradually become diluted in the course of the 19th century, and its memory was only revived in the 20th, in the context of the so-called 'historically informed performance'.

VI.

Photographic vision has to do with three operations, which answer as many questions.

1. What do I focus on, what catches my attention, what do I select? Attention extracts scenes from the situation.

2. The manner of doing it. What do I do to highlight this fragment from the reality at the time of photographing it? Which viewpoint do I adopt? How far away do I stand? What do I include in the frame? What do I exclude? In which hierarchy do I position the different elements that appear in the frame?

3. Which photographs do I select, and how do I arrange them, so that my intention becomes clear?

The first and second operations occur camera in hand, they are actions on the 'real reality'. The third one is done on the images, it is a manipulation of the photographs, which are a second-generation reality. In the first and second stages I tour the world. In the third one I review the images I have been gathering.

The fact that there are good and bad photographs demonstrates that photographic representation does not overlap what is being represented: reality can be represented better or worse. This is why it is possible to educate the photographic vision –in this it is no different from skills such as playing an instrument, driving a vehicle, skiing, running, dancing or drawing– and this ultimately implies the idea of authorship. The author knows the possibilities of this prosthesis that is the photographic device and fits in with them to express himself. The same notion of authorship entails that of expression.

Photography, from the very moment of its birth, succeeds in making light and its counterpoint, shadow, become a theme, and this without the detail suffering any impairment.

This matter occupies a central spot in the recent history of western art. It is the polemical *disegno / colore*, that is, Poussin / Rubens, Florence / Venice, set forth in the terms of understanding vs. manual skill –drawing appeals to the intellect; colour, however, only appeals to the eyes, it only requires manual skill– a polemic which Le Brun, the painter of Louis XIV, settled in 1672 when he said that "drawing can exist without colour, but colour cannot exist without drawing". Almost a century later, Kant, in §14 of *Critique of Judgment,* defends pure drawing in clean lines –Hergé's ligne claire– and rejects colour. Kant prefers it to the other; what is more, he gives primacy to line drawing[18]. But in eliminating shadows it pins down reality, immobilises it; always equal to itself, it turns it into pure spatiality.

What would Kant have thought of photography, the mechanical means capable of integrating categories that had hitherto appeared to mutually exclude each other?

VII.

A little more than a century before Napoleon's expedition to Egypt, in 1669, during Louis XIV's reign and with the Royal Academy placed at the service of the crown's image, painters were arranged hierarchically according to their theme. Still life was on the lowest rung, then came landscape, then living animals, namely in movement, then portraiture and, finally, the painting of groups of human figures inspired in history, mythology and religion. The quality of the work thus depended on the quality of what was being represented: *ut pictura poesis*, as is painting, so is poetry[19]. The thing, the still life, barely has any merit.

But one of the photographs, the sixth one, published by Fox Talbot in *The Pencil of Nature,* shows a broom leaning against a doorjamb. Its author justifies his choice of theme in the following manner in the text that accompanies it:

17. Nikolaus Harnoncourt expresses it very clearly in *Musik als Klangrede. Wege zu einem neuen Musikverständnis*. Salzburg, 1982. This translates as *Music as [Sound] Speech. Towards a New Comprehension of Music.*

18. Cf. Jean Starobinski, *1789, Los emblemas de la razón (The Emblems of Reason)*. Madrid, 1988. Pages 165-167.

19. Lino Cabezas, "Ut pictura poesis", pages 332-333, in J. J. Gómez Molina, L. Cabezas, M. Copón, *Los nombres del dibujo (The Names of Drawing)*. Cátedra, 2005.

"This is one of the trifling efforts of infancy [of the new art of photography], which some partial friends have been kind enough to commend. We have sufficient authority in the Dutch school of art, for taking as subjects of representation scenes of daily and familiar occurrence. A painter's eye will often be arrested where ordinary people see nothing remarkable. A casual gleam of sunshine, or a shadow thrown across his path, a time-withered oak or a moss-covered stone may awaken a train of thoughts and feelings, and picturesque imaginings."

Of the tenth photograph –*The Haystack*– Talbot says: "One advantage of the discovery of the Photographic Art will be, that it will enable us to introduce into our pictures a multitude of minute details which add to the truth and reality of the representation, but which no artist would take the trouble to copy faithfully from nature. / Contenting himself with a general effect, he would probably deem it beneath his genius to copy every accident of light and shade; nor could he do so indeed, without a disproportionate expenditure of time and trouble, which might be otherwise much better employed. / Nevertheless, it is well to have the means at our disposal of introducing these minutiae without any additional trouble, for they will sometimes be found to give an air of variety beyond expectation to the scene represented."

Yes, photography has worth for what it shows, but also for how it shows it, to the point that, sometimes, when paying attention to it, when recognising, when considering it, it grants validity to something that in principle did not have it.

VIII.

The speed of photography –speed in taking the photograph, in obtaining it, in disseminating and publishing it, the way this mechanical medium accelerates the production of images, runs parallel to an increase in what we see thanks to it.

An excellent example of this enlargement of reality is provided by the devices invented by Muybridge and Marey around 1890: the images of a galloping horse or a dancing human forced a root-cause review of the ideas hitherto held on the movement of bodies, ideas that were linked to the limitation of our perception.

From the point of view of how the increasingly inquisitive device has evolved, the history of photography is the history of how the ranges of reality have been enlarged: the list of snappable things has become longer and longer as photographic technology has progressed. What we see depends on how we do it. A modification in the how brings about a change in the what. The first lenses were manufactured in the 13th century, in Italy. From then on we *observe*, that is to say, we see more and better, with the physical eye, and not only with the eye of the imagination. The "what' depends on the 'how', which overlaps the 'with what'. And so photography will make visible and make important a series of aspects of reality that existed for no one before they were photographed. To put it in Kantian terms: changes in the devices of perception –the how– alter the spatiotemporal conditions by enlarging, dilating, expanding them.

Having reached this point, I want to give another twist to the impossibility of representing temporality, the fourth dimension, in images. This issue –we saw it at the start– marks the major difference between the visual and the verbal. Let's go back to the pre-photography era, the Dutch seventeen-hundreds. Samuel van Hoogstraten, a pupil of Rembrandt, uses in his treaty on painting (1678) the adverb *oogenblikkig* (= instantaneous) when he mentions the fleeting crossing of glances between the painter and his model, an encounter he would try to secure on canvas, and which means two things[20]. First it points to the complicity between the portraying and the portrayed person, thus pointing out the autonomy of both of them. But it also refers to what has happened earlier and will happen afterwards, because thanks to being mobile, the gazes can encounter each other for an instant, a moment, an *oogenblikk*, which in German is similarly called an *Augenblick*, literally 'eye's gaze'. To put it differently, the *Augenblick* provides the image *augenblicklich* (= instantaneously), which is pure present, with the temporal dimension that it lacks, making it mobile without it ceasing to be immobile. For an instant, the *Augenblick* turns it into an oxymoron. Later, when the viewer finds himself before the image –whether painting, drawing or photography, the gaze of the portrayed person will question him.

IX.

On 1 July 1798 a powerful army under Napoleon's command took Alexandria. A year later, on 5 June 1799, Alexander von Humboldt left La Coruña on the *Pizarro* and started his voyage around the New World. Having abandoned the idea of going to Egypt with Napoleon, he travelled to Spain and managed to convince Charles IV[21] to authorise him to tour

20. Cf. A. Spira, *The Invention of the Self. Personal Identity in the Age of Art*. London, 2020. Pg. 249.

21. Humboldt argued that he proposed to study the geology of the colonies, which was crucial for exploiting their mining resources. Moreover, the fact that in the Ancien Régime the economy basically consisted of agriculture and livestock farming explains the interest in botany and zoology of the 18th-century expeditions. The goal of the voyage to Tahiti of the *Bounty* (1787) was thus to collect cuttings from the breadfruit tree to feed the slaves in the Antilles.

the American colonies. He returned to Europe five years later, in 1804[22].

These two occurrences irreversibly modified the discourse on reality. The twenty-three volumes of the *Description de l'Égypte*, the result of the fieldwork of the hundred and sixty-seven scientists and nearly two thousand artists who had taken part in the expedition, were finally all published in 1823, two years after Napoleon's death on the island of Santa Elena where he had been banished in 1815. That his fall did not interrupt the work's publication is an indication of the reception it enjoyed.

In regard to Humboldt, each one of the sixteen public conferences –the *Kosmos-Vorträge*– he gave free of charge at Berlin's Singakademie between December 1826 and March 1827 was attended, according to documentary evidence of the period, by eight hundred people from all classes and strata, from the king of Prussia to a master bricklayer. This cycle can be considered an advance on the book –*Kosmos. Entwurf einer physischen Weltbeschreibung*, [Cosmos: A Sketch of a Physical Description of the Universe]– which this scholar had started to publish in 1845. The plates, which effectively combine images, signs and legends, show Humboldt's conclusions with such clarity, rigour and conviction that they almost make the reading of the running texts unnecessary. His graphic solutions, which have lost none of their effectiveness, make this a pinnacle of design still valid today.

X.

The 17th and 18th centuries were in thrall to building a theory that would explain reality as a *continuum*. The senses –sight, hearing, smell...– and their corresponding stimuli –colours, notes, smells...– are thus underpinned and explained by a system of correspondences. Behind them is the desire to explain the satisfaction we feel in the experience of beauty. What is harmony? When does it occur? In discussing these matters, old themes re-emerge that the newborn experimental sciences, based on the direct observation of nature, clothe in new garments. The Pythagorean notion of correspondence between the micro and macrocosm, of accord as a conjunction of vibrations, of harmony and disharmony, resounds in theories formulated by persons who are probably endowed with extraordinary synaesthetic capabilities. An excellent example is the Jesuit Louis-Bertrand Castel, who in 1734 built his first 'ocular harpsichord'. He pursued that, when played, it would be heard and at the same time seen, for each note had to be paired with a colour, which would appear when pressing the corresponding key. And although Castel was not successful, his project was based on the assumption, correct in principle, that both sounds and colours, but also smells and flavours, were reduced to vibrations. In this context, the two essays written by Diderot with two years' difference, on sight and hearing[23], were highly significant.

The encyclopaedist mentality is inseparable from this desire for an all-encompassing and totalising explanation. The *savants* and artists who drafted and drew the *Description de l'Égypte*, Alexander von Humboldt, Thomas Young, Goethe... were all seeking all-embracing explanations. But here, too, we should avoid the error of projecting our ideas regarding the sciences on these 'proto-scientists'. For them there were still no differences between those of the spirit and those of nature, and their reverential sense before the cosmos differed from ours in degree and character. It was also accompanied by enthusiasm, a hugely important characteristic of the disposition of the time, which is explained by the acute feeling they had of living on the threshold of a new epoch. Uriel's aria at the start of Haydn's *The Creation*, after the "let there be light, and there was light" of the chorus, expresses it well: "Now vanish before the holy beams / the gloomy dismal shades of darkness; / the first of days appears! / Disorder yields and order fair prevails."[24]

A CHRONOLOGY

This chronology essentially encompasses a hundred and twenty-four years, from 1715 –the foundation of Karlsruhe– to 1818 –Mary Shelley: *Frankenstein*– to 1826 –Carnot and thermodynamics– to 1839 –the year the daguerreotype was announced. In other words, the baroque, classicism and romanticism in the history of European music.

Even though historical events and developments are not in line with the framework of the centuries, we insist on associating them with eras and mentalities. This forces us to turn the century of photography, the 19th, into an especially long one starting in 1789 and ending in 1918, whereas the 18th century, that of the Enlightenment, did cover the requisite

22. The key criterion that guided the routes of the 'savants' in Egypt was history, which is why they scoured the major ruins of the past. For Humboldt, however, who travelled along the rivers and sought out the major peaks, it was geography that spurred him on.

23. *Letter on the Blind for the Use of Those Who See* (1749), *Letter on the Deaf and Dumb* (1751).

24. "Nun schwanden vor dem heiligen Strahle / des schwarzen Dunkels gräuliche Schatten: / Der erste Tag entstand. / Verwirrung weicht, und Ordnung keimt empor." No. 2, Uriel's Aria.

hundred years provided we accept that its start –1685, when Louis XIV, by revoking the Edict of Nantes, sent into exile the Huguenots who did not want to convert to Catholicism and, firmly installed in Versailles, he became an absolute sovereign– and its end do not coincide with 1700 and 1800 respectively.

There are a few initial entries pre-1715 because, with the body and its use being the theme that underpins this text, we need, for the sake of clarity, to go back to the Renaissance.

We should remember that communications before the advent of the telegraph and the railway were extremely cumbersome. The dissemination of knowledge and ideas was consequently very slow and irregular. The news of the storming of the Bastille thus took two weeks to arrive in Madrid.

The procedure I followed in both collecting the information and in drawing up the chronology is, let's admit it, essentially photographic. While reviewing the territory of the texts I took 'snapshots' of those 'vistas' that spoke to me and struck me as being especially significant.

1543. Vesalius: *De humani corporis fabrica*. Illustrated with a series of astonishing plates, it is republished many times. Through observation he invalidates Galen.

1614. The orchestral ensemble *Les vingt-quatre violons du roi (La Grande Bande)* is created in Versailles, playing on major occasions. With Lully, who imposes strict discipline –same coordination, dynamic and ornamentation for all instruments– the orchestra was imitated in all the European courts.

1628. William Harvey: *De motu cordis*. [The disillusioned body]

1634. Louis XIII creates the *Académie française* as an institution to govern, rationalise and oversee the French language.

1658. Comenius: *Orbis sensualium pictus*. 1st illustrated book for children in Latin and German.
1659. *Visible World* appears translated into English.

1667. Milton: *Paradise Lost.*

1682. Louis XIV is installed in Versailles.

1685. Louis XIV revokes the Edict of Nantes of 1598.

1687. Death of Lully, the superintendent of the royal music at Versailles.

1715. Karl Wilhelm, margrave of Baden-Durlach, founds Karlsruhe.

1717. Gabriel David Fahrenheit proposes the scale that bears his name.

1735-1745. La Condamine: French geodesic mission. Jorge Juan and Antonio Ulloa take part in it. In 1748 they publish their *Relación histórica del viaje a la América meridional* (A Voyage to South America).

1726-1740. Benito Jerónimo Feijóo: *Teatro crítico universal* (Universal Critical Theatre).

1736. John Harrison: marine precision chronometer.

1741. Paris. Andry de Boisregard: *L'Orthopédie*.RAE (Royal Spanish Academy of Language): *Ortografía* (Grammar).

1743. Regulations for the Prussian Infantry. Highest speed and effectiveness thanks to breaking up actions into times. [Cf. Foucault. *Discipline and Punish*, pg. 179 in the Spanish edition.]

1751. Linnaeus: *Philosophia botanica*.Voltaire: *Le siècle de Louis XIV*, Berlin.

1752. Royal Order for the erection of the Real Academia de Bellas Artes de San Fernando (the Royal Academy of Fine Arts).

1751-1772. Diderot / d'Alembert: *L'Encyclopédie.*

1753. First astronomical observatory in Cádiz.

1755. 1 November, All Souls' Day: Earthquake in Lisbon.

1758. Burriel: *Informe de la Imperial de Toledo al Real y Supremo Consejo de Castilla sobre igualación de pesos y medidas en todos los Reynos y Señoríos de su Magestad*. (Report of the Imperial of Toledo to the Royal and Supreme Council of Castile on the equalisation of weights and measures in all the Kingdoms and Domains of His Majesty).

1762. The first volume of illustrations of *L'Encyclopédie* appears.

1764. Sociedad Vascongada de Amigos del País (Basque Society of Friends of the Country).Winckelmann: *Geschichte der Kunst des Alterthums*, with 24 engravings.

1766-1769. L. A. de Bougainville circumnavigates the Globe. Rousseau's idea of the 'noble savage' inspires him in the description he makes of the indigenous societies of the South Seas in his *A Voyage Around the World*.

1766. Lessing: *Laocoon*. [perhaps one of the best-known treatments of the 'ut pictura poesis' theme].

1767. Esteban de Terreros (SJ): *Diccionario castellano con las voces de las ciencias y las artes* (Castilian dictionary with the terms for sciences and the arts), Madrid: first appearance in a dictionary of the term 'fibre'.

1768. The Count of Aranda (under Charles III) orders the first census of the Spanish population.

1768–1771. *Encyclopaedia Britannica*.

1774. Goethe: *Werther.*

1777. Lavoisier discovers oxygen and associates it with breathing, which he explains as a form of combustion.

1777–1788. Botanical expedition by Ruiz and Pavón to the Viceroyalty of Peru.

1780. Galvani discovers animal electricity. [The profound unity in nature of biology and physics. > 1818 Mary Shelley: *Frankenstein*].

1781. Kant: *Kritik der reinen Vernunft*: 'thing-in-itself / thing-for-me'.Herschel discovers Uranus.Johann Heinrich Füssli: The Nightmare [> Goya: *The Sleep of Reason* 1796-1798].

1783. Montgolfier brothers: first aerostatic flight.Peace of Paris: independence from the United States of America.

1786. Casanova meets Lorenzo da Ponte and Mozart to draft the libretto for *Don Giovanni.*

1787. British expedition to Australia (1st Fleet). Voyage of the *Bounty* to Tahiti (breadfruit tree).Goethe in Palermo: the *Urpflanze*, the *Urformen* [proto-plant, proto-forms = pre-revolutionary ideas].Horace–Bénédict de Saussure [an ancestor of Ferdinand, the linguist] is the first non-professional to crown the Mont Blanc at the head of a scientific expedition (the start of alpinism].

1788. Lagrange: *Mécanique analytique*.Casanova: *Histoire de ma fuite des ... les Plombs*.

1789. Kant: *Kritik der Urteilskraft*.26 August: Declaration of the Rights of Man.

1789–1794. Malaspina expedition.

1790. Goethe: *Die Metamorphose der Pflanzen* [The Metamorphosis of Plants].Decimal Metric System.

1792. 25 April: first application of the guillotine, a rapid and egalitarian form of execution.A forerunner to photography appears, the physiognotrace.*La Marseillaise.*Volta: *Letters on animal electricity*.

1793. 21 January: execution of Louis XVI. Marie Antoinette's took place on 16 October.Founding of the Natural History Museum in Paris.10 October: the Terror commences.Schiller: *Über die ästhetische Erziehung des Menschen in einer Reihe von Briefen* [On the Aesthetic Education of Humanity. He speaks of art in the year of the Terror because art possesses the ability to unite in brotherhood in the midst of a profound crisis. In this text Schiller gives an exact diagnosis of alienation, the *Entfremdung*.

1796. Jenner: smallpox vaccine.Laplace: *Exposition du système du monde*. 1799 *Mécanique céleste*. [Reduction of the cosmos to an equation].Alois Senefelder invents lithography.

1798. Expedition to Egypt. [> Suez Canal in mind]. Malthus: *An Essay on the Principle of Population*.Haydn: *The Creation*. Libretto by Gottfried van Swieten based on the Book of Genesis and on Milton's *Paradise Lost*.

1799. Implementation of the Decimal Metric System.Volta makes the first voltaic pile.1 June: Alexander von Humboldt sails for America from Coruña.22 August: Napoleon abandons his army in Egypt and returns to France without notice.9 November (18 Brumaire): Coup d'état.

1800. Creation of the Bank of France.

1801–1805. Plundering of the Parthenon: Lord Elgin, the United Kingdom ambassador to the Ottoman Empire, takes parts of the Athens Acropolis back to London.

1802. Goya: *The Clothed Maja, The Naked Maja*.A. von Humboldt undertakes the ascent of the Chimborazo

(Ecuador) and is short of the summit by 350 metres. He is seeking to confirm his hypothesis on internal geological processes [Neptunists / Plutonists]

1803–1807. Travels of Ali-Bey (Domingo Badía) in Africa and the Levant.

1805. Jacquard: loom for making patterned fabrics.

1809. Lamarck: *Philosophie zoologique*.

1809–1823. *Description de l'Égypte*.

1814. *Voyages d'Ali-Bey en Afrique et en Asie, pendant les années 1803, 1804, 1805, 1806, 1807*.

1818. Mary Shelley: *Frankenstein.*

1826. Carnot formulates the conversion of calories into work.

1839. 25 February: A. v. Humboldt –who formed part of the committee of the Paris Academy of Sciences in charge of reporting on the daguerreotype– writes a letter to C. G. Carus telling him about his visit to Daguerre.

A few dates in the life of Thomas Young

1813. He introduces the term 'Indo-European languages' in his review of Johann Christoph Adelung's *Mithridates oder allgemeine Sprachenkunde*, in which the German philologer discusses, among other things, Euskera, the Basque language, which also deeply interested Wilhelm von Humboldt, Alexander's brother.

1816–17. 'Bridge': unsigned article in the *Encyclopaedia Britannica*.

1822. In Paris he attends the session of the Académie des Inscriptions et Belles-Lettres in which Champollion announces that he has deciphered demotic script.

1823. 'Tides': unsigned article in the *Encyclopaedia Britannica*.

BIRTH
OF PHOTOGRAPHY
IN THE EAST

TEXTS BY
Ignacio Miguéliz

Noël-Marie-Paymal Lerebours (1807-1873)

French optician and photographer, author of several studies on the daguerreotype. Between 1841 and 1842 he published *Excursions Daguerriennes. Vues et Monuments les plus remarcables du globe*, a collection of engravings with views of Europe, North Africa, the Middle East and North America. The engravings were accompanied by a brief scientific description of the image depicted. In this case, the engravings were not based on a previous drawing, but on daguerreotypes made by different photographers collected by Lerebours. This publication followed in the footsteps of the albums of engravings that collected the voyages of exploration and scientific journeys developed throughout the 18th and 19th centuries.

Noël-Marie-Paymal Lerebours. St. Jean d'Acre (Syrie). Daguerreotype: Lerebours. Engraving: Salathé. 1840.

Noël-Marie-Paymal Lerebours. Egypte. La vallée des tombeaux. Daguerreotype: Lerebours. Engraving: Salathé. 1840.

Noël-Marie-Paymal Lerebours. Syrie. Temple du soleil a Baalbec. Daguerreotype: Lerebours. Engraving: Salathé. 1840.

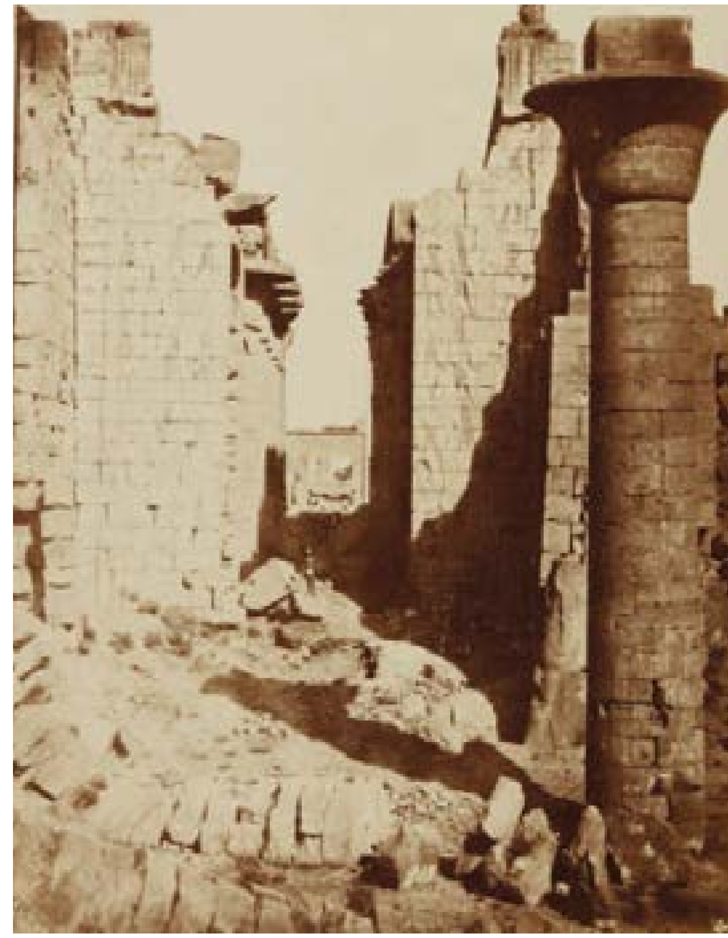
Maxime du Camp (1822-1894)

Writer and amateur photographer, a technique he had learned with Gustave Le Gray, motivated both by the interest he felt in this medium and by the usefulness he saw in capturing reality in a precise and exact manner. A tireless traveler and enthusiast of the Orient, between 1849 and 1851 he undertook, together with the writer Gustave Flaubert, a mission to Egypt and the Near East, with the purpose of photographing the monuments and ruins of antiquity. During their trip they visited Cairo and went to the south of Egypt and Nubia following the course of the Nile, passing in July 1850 to Palestine, Turkey and Greece, arriving in Italy in April 1851. This trip was recorded by du Camp in the album *Égypte, Nubie, Palestine et Syrie. Dessins photographiques recueillis pendant les annes 1849, 1850 et 1851*, which collected 125 photographs of the author, printed by Blanquart-Evrard and published in 1852. He also privately published several portfolios containing 174 images, in which a loss of intensity and color can be appreciated.

Maxime du Camp. Untitled. c. 1850. Albumen paper.

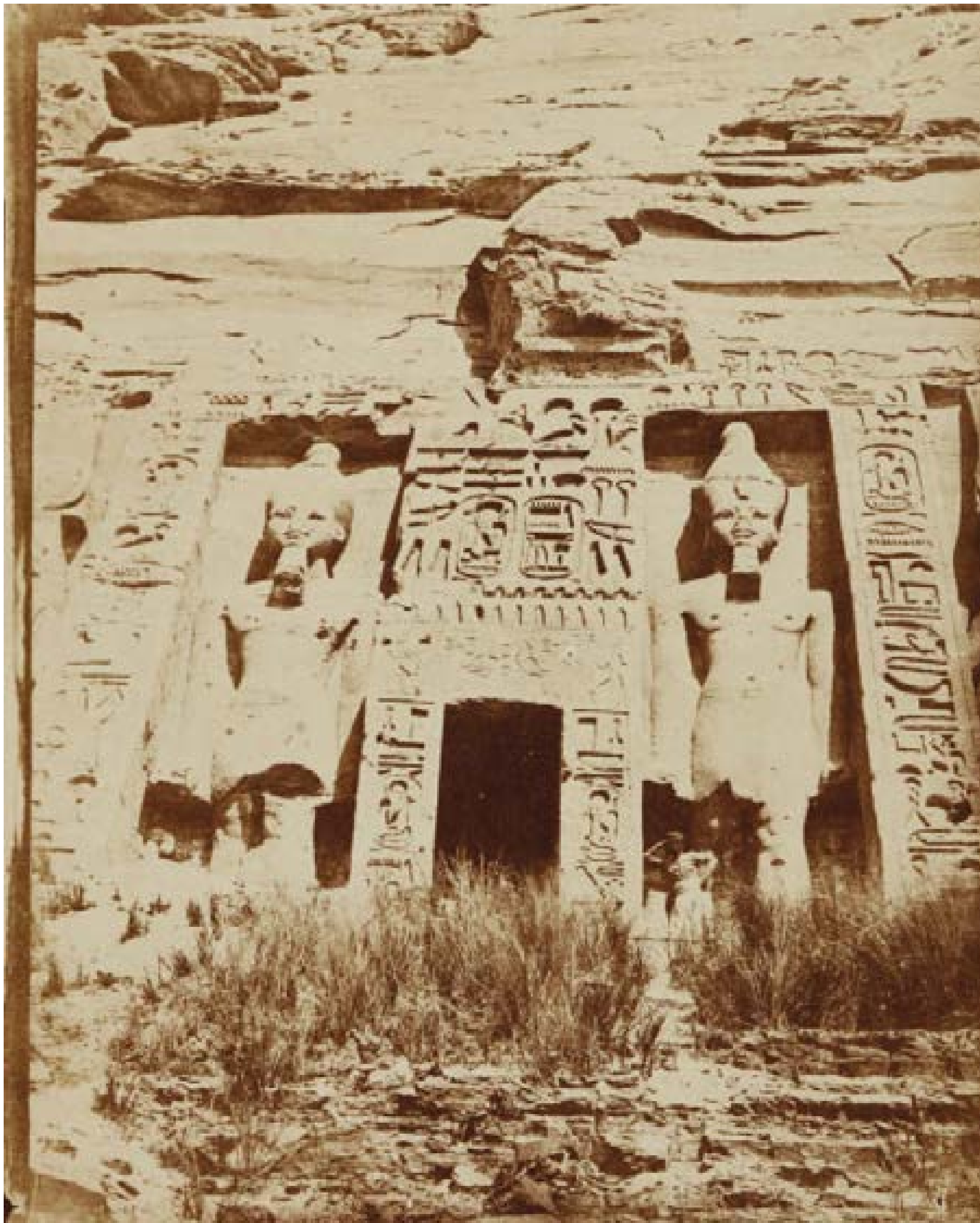
Maxime du Camp. Untitled. c. 1850. Albumen paper.

Maxime du Camp. Untitled. c. 1850. Albumen paper.



Maxime du Camp. Untitled. c. 1850. Albumen paper.

Maxime du Camp. Untitled. c. 1850. Albumen paper.



Maxime du Camp. Untitled. c. 1850. Albumen paper.

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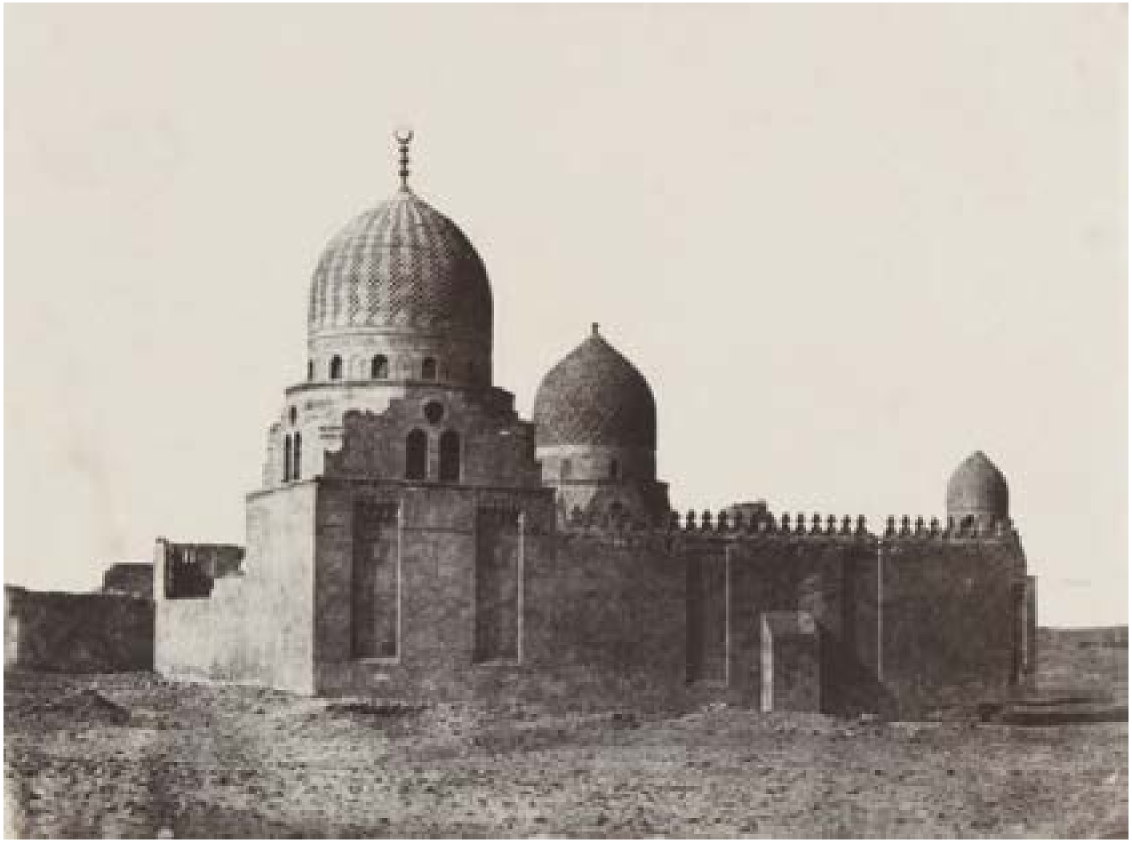
Maxime du Camp. Untitled. c. 1850. Albumen paper.



Maxime du Camp. Untitled. c. 1850. Salted paper.

Maxime du Camp. Untitled. c. 1850. Salted paper.

Maxime du Camp. Untitled. c. 1850. Salted paper.

Maxime du Camp. Nubie. Rive septentrionale du Nil. c. 1850.
Salted paper.

Maxime du Camp. Thèbes. Gournah. Palais de Menephta 1er. c. 1850.
Salted paper.

Maxime du Camp. Nubie. Forteresse d'Ibrym. c. 1850. Salted paper.

Maxime du Camp. Untitled. c. 1850. Salted paper.

Maxime du Camp. Nubie. Grand temple d'Isis, a Philoe. Proscynéma. c. 1850. Salted paper.

Maxime du Camp. Thèbes. Palais de Karnak. Sculptures extérieures du sanctuaire de granit. c.1850. Salted paper.

Maxime du Camp. Thèbes. Palais de Karnak. Vue genérale des ruines, prise à l'est. c. 1850. Salted paper.

Maxime du Camp. Nubie. Temple de Dakkeh. Vue Genérale. c. 1850. Salted paper.

Félix Teynard (1817-1892)

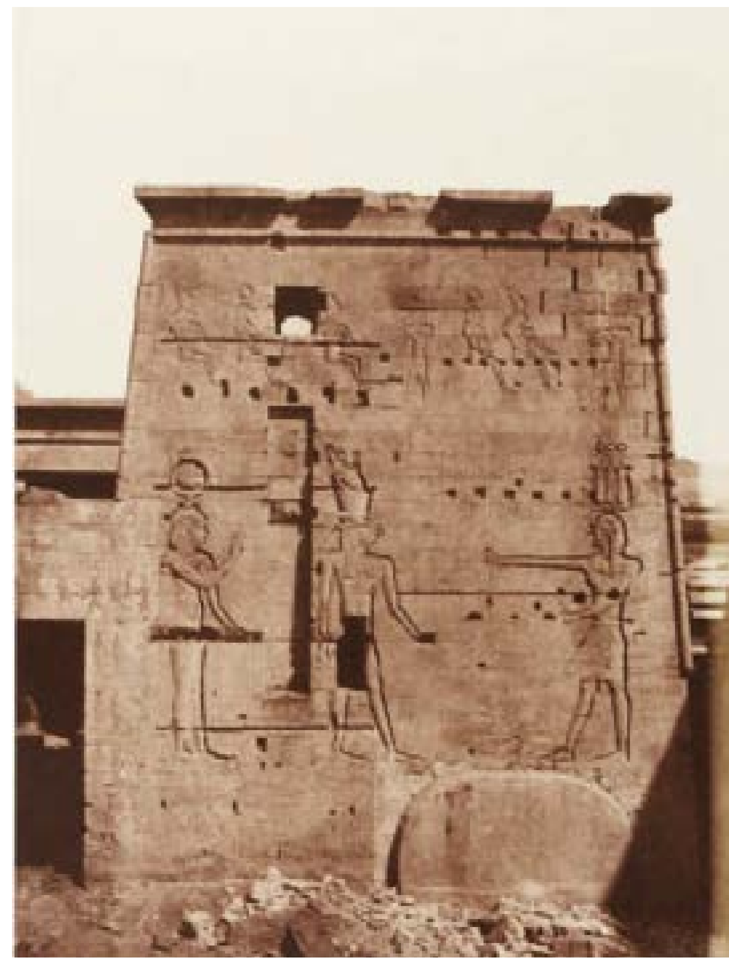
French engineer and amateur photographer who in 1851 embarked on an archaeological expedition to Egypt with the aim of photographing architectural structures in the country, traveling the country following the course of the Nile, from Cairo to the second cataract. The result of his trip was the album *Égypte et Nubie, sites et monuments les plus intéressantes pour l'étude de l'art et de l'histoire*, published in 1858 by the Goupil publishing house. This publication included 160 photographs, salt paper, accompanied by explanatory texts and plans, which contained information on the exact spot where the photographs were taken. Subsequently, Teynard returned to Egypt in 1869 for the inauguration of the Suez Canal, although he did not take photographs on that trip. He abandoned the practice of photography for research on it, becoming interested in studies of the photographic process, chemistry and optics.

Félix Teynard. Nubie. Île de Fîleh (Philae). Colonnade orientale, ruines vues du point S. c. 1851-1852. Salted paper.

Félix Teynard. Nubie. Ile de Fîleh (Philae). Édifice de l'est, vue générale prise du point C. c. 1851-1852. Salted paper.

Félix Teynard. Nubie. Premiére cataracte. Montagnes granitiques couvertes de sables. c. 1851-1852. Salted paper.

Félix Teynard. Égypte. Karnak (Thèbes).
Palais, salle hypostyle, colonnade centrale, chapiteaux.
c. 1851-1852. Salted paper.

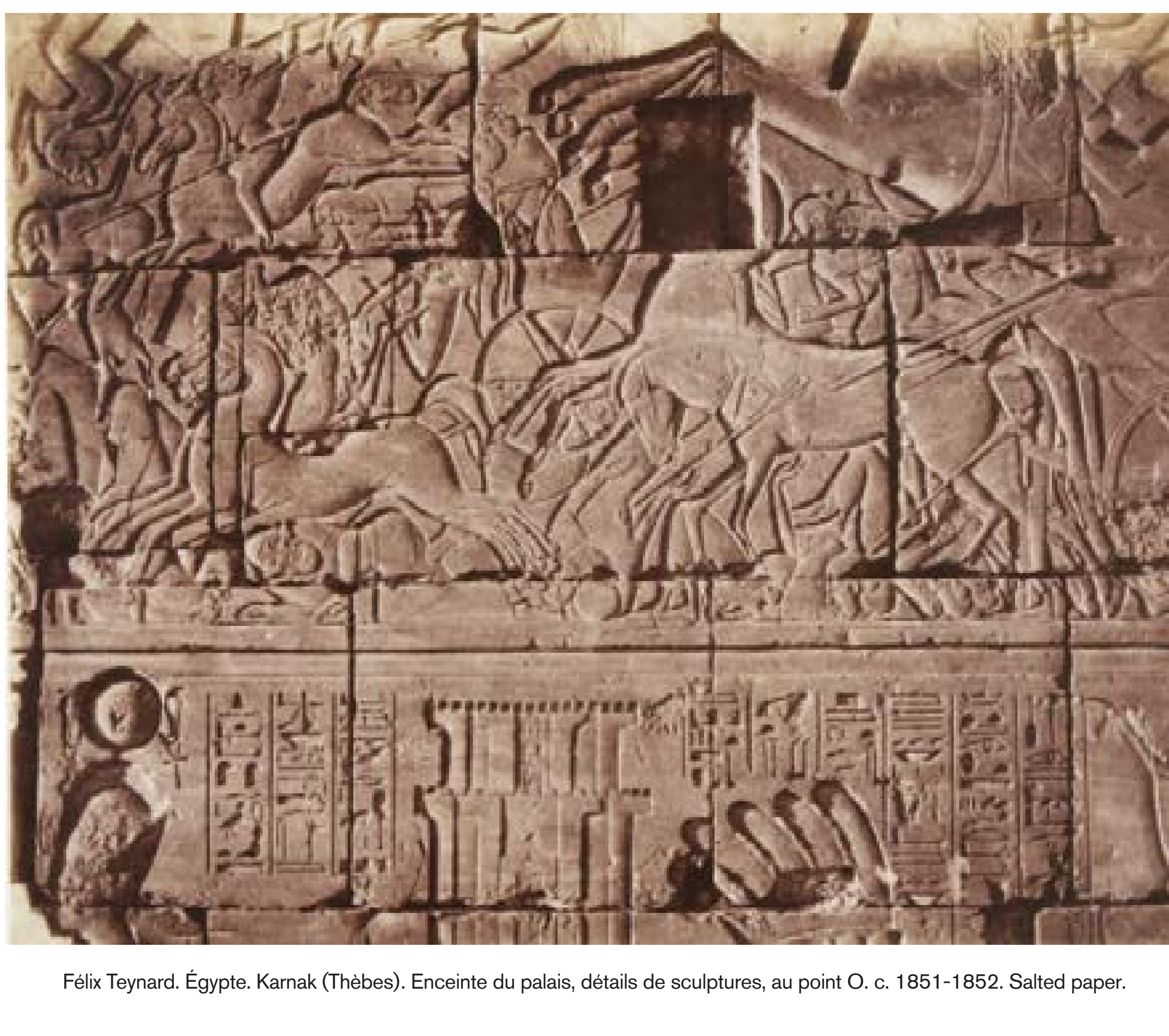


Félix Teynard. Nubie. Île de Fîleh (Philae). Deuxieme pylône,
partie orientale vue de la plateforme intérieure du premier pylôle,
du point G. c. 1851-1852. Salted paper.

Félix Teynard. Nubie. Deuxième cataracte. Vue générale prise du désert, sur la rive gauche du Nil. c. 1851-1852. Salted paper.

Félix Teynard. Égypte. Karnak (Thèbes). Palais, salle hypostyle, colonnade centrale, chapiteaux. c. 1851-1852. Salted paper.

Félix Teynard. Nubie. Kalabcheh (Talmis). Ruines du temple, vue intérieure du Naos. c. 1851-1852. Salted paper.



Félix Teynard. Égypte. Karnak (Thèbes). Enceinte du palais, détails de sculptures, au point O. c. 1851-1852. Salted paper.

Otho von Ostheim

Austrian photographer who participated in the interest that photography experienced in the eastern Mediterranean in the third quarter of the 19th century, moving to the Holy Land, where he collected monuments and urban and natural views, among others, of Beirut, Damascus and Jerusalem.

Otho Von Ostheim. Jerusalem. Mont des oliviers. c. 1864. Albumen paper.

Otho Von Ostheim. Jerusalem. Mont des oliviers. c. 1864. Albumen paper.

James Robertson (1813-1888)

Scottish engraver and photographer, who arrived in Constantinople in 1841 as Superintendent and Chief Coin Engraver, after which he became interested in photography, opening a studio in the city in 1853. He was brother-in-law of the also photographers Antonio and Felice Beato, associating with the latter between 1853 and 1867 under the name of *Robertson and Beato*. He made reports on Balaklava and Sebastopol in the context of the Crimean War, some of whose images were published in the press of the time. In 1857 he moved to India with his brothers-in-law, where he collected images of the rebellion of the Sepoys. From 1867 to 1881 he resumed his work as an engraver for the Ottoman Empire, moving to Yokohama, Japan, where he died.

James Robertson. Untitled. c. 1857. Salted paper.

James Robertson. El Cairo. 1857. Salted paper.

James Robertson. La Mezquita del Sultán. 1857. Salted paper.

James Robertson. Balaclava. 1855. Salted paper.

Auguste Salzmann (1824-1872)

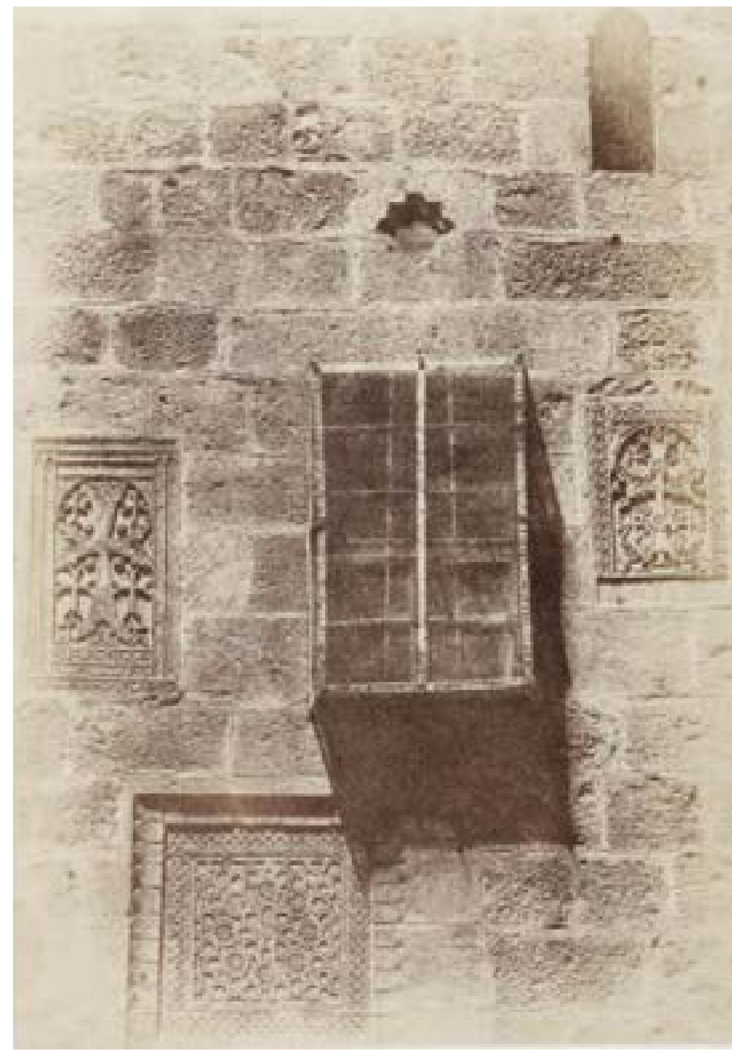
French archaeologist, painter and photographer, who in 1853, as part of a scientific mission to the East promoted by the French Ministry of Public Instruction, undertook a trip to Egypt, in order to study archaeological remains linked to the Order of Malta on the island of Rhodes, although he finally went to Jerusalem, with the aim of photographically recording all its monuments. He was one of the first archaeologists to use photography to record the discoveries in a truthful way, which he did in a novel way. In 1854 he published a three-volume album containing 178 images printed by Blanquart-Evrard, which had a second edition in 1856 under the title *Jérusalem. Étude et reproduction photographique des monuments de la Ville Sainte despuis l'epoque judaïque jusqu'à nos tours,* edited by Gide and J. Baudry.

Auguste Salzmann. Jérusalem. Tour de David. c. 1856. Salted paper.

Auguste Salzmann. Jérusalem. Auberge d'Allemagne.
c. 1856. Salted paper.

Auguste Salzmann. Jérusalem. Fontaine arabe.
c. 1856. Salted paper.

Auguste Salzmann. Jérusalem. Saint Sépulcre.
c. 1856. Salted paper.



Auguste Salzmann. Sin título.
c. 1856. Salted paper.

Francis Frith (1822-1898)

British photographer and publisher, one of the founders of the Royal Photographic Society in 1853. He made several trips to the Near East between 1856 and 1860, as well as to Spain, where he took numerous photographs of its monuments, images that he later marketed in his own publishing house, in which he collaborated with other authors, such as Robert Peter Napper. He published several albums with the images of his trips to the Orient: Egypt and Nubia in 1857, *Egypt and Palestine,* circa 1857, *Cairo, Sinai, Jerusalem and the Pyramids of Egypt,* circa 1860, or *Egypt, Nubia and Ethiopia,* in 1862.

Francis Frith. The Mosque of the Emeer Kahoor. c.1857. Albumen paper.

Francis Frith. Interior court of Medinet Haboo, Thebes. c.1857. Albumen paper.

Francis Frith. Colossi and Sphynx at Wady Saboua. c.1857. Albumen paper.

Francis Frith. Baalbec from the South.
c.1857. Albumen paper.

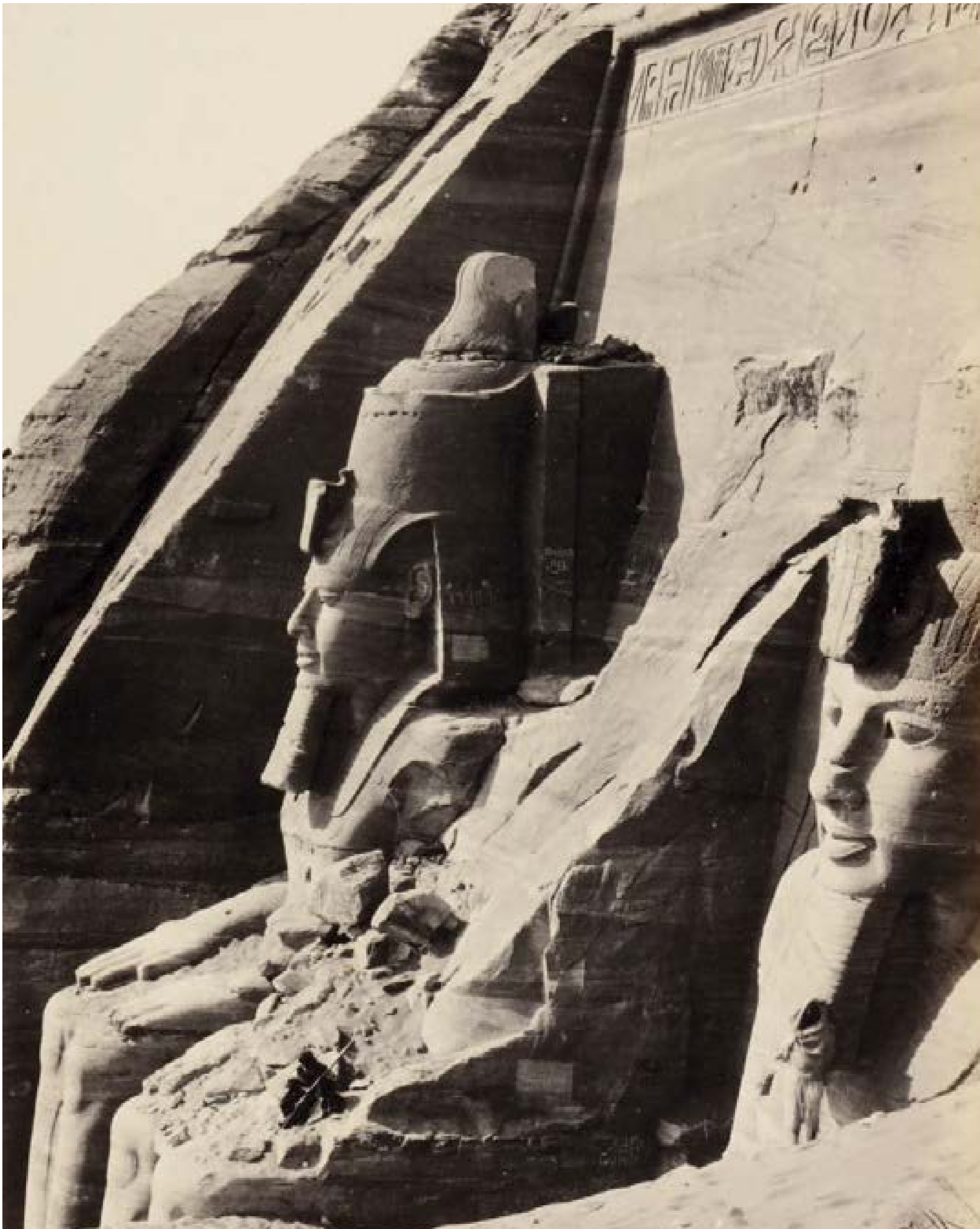
Francis Frith. View from Biggeh, looking South.
c.1857. Albumen paper.

Francis Frith. The Temple of Maharraka, Nubia.
c.1857. Albumen paper.

Francis Frith. View from Philae, looking North.
c.1857. Albumen paper.

Francis Frith. The Temple of Wady Kardassy, Nubia. c.1857. Albumen paper.

Francis Frith. Assouan. c.1857. Albumen paper.



Francis Frith. Abou Simbel, Nubia. c.1857. Albumen paper.

Francis Frith. Sculptured gateway, Karnac. c.1857. Albumen paper.

Francis Frith. Distant view of Damascus. c.1857. Albumen paper.

Francis Frith. Portico of the Temple of Dendera. c.1857. Albumen paper.

Francis Frith. View from Philae, looking North. c.1857. Albumen paper.

Hippolyte Arnoux (c. 1860-c. 1890)

French photographer and publisher whose work in Egypt in the 1960s and 1970s, when he established his studio in Port Said, is documented. He was appointed official photographer for the Universal Company of the Suez Canal, for which he documented the excavation work of the Canal, work he published in *Album du Canal de Suez*. For this work he probably hired the Zangaki brothers to help him, whom in 1874 he denounced for appropriating his work, winning the lawsuit in 1876. In the late 1960s he temporarily associated with Antonio Beato, who had a studio open in Luxor.

Hippolyte Arnoux. Untitled. c. 1860. Albumen paper.

Hippolyte Arnoux. Les trois pyramides du Ghiseh. c. 1860. Albumen paper.

Abdullah freres. Viçen (1820-1902), **Hovsep** (1830-1908) **& Kevork** (1839-1918)

The brothers Abdullah, Vinçen, Hovsep and Kevork, Armenian photographers who opened studios in Constantinople in 1858, and later in Cairo between 1886 and 1895. They gained recognition as official photographers of Sultan Abdulaziz in 1863, and through their Constantinople studio passed not only the elite of the Empire, but also foreign visitors. They collected images of the city, its monuments, sights and inhabitants, in the album *Constantinople Ancienne et Moderne*, and later, in 1878, and for the Universal Exhibition they published *Views of Istanbul and Historical Arms of Turkey*. In 1899 they sold the studio to the photographers Pascal Sebah and Polycarpe Joaillier, associates between 1884 and 1900.

Abdullah Freres. Les chiens errants. c. 1870. Albumen paper.

Louis de Clercq (1836-1901)

French archaeologist, historian, collector and photographer who between 1858 and 1860 joined the expedition organized by the archaeologist Guillaume Rey to the Orient, which ended in Spain. The result of his journey was published in six volumes, with a total of 222 calotypes, five of them under the common title of *Voyage en Orient,* which included his journey through Syria, Palestine and Egypt, and the sixth with the title of *Villes et monuments pittoresques d'Espagne*, which, as its name indicates, was dedicated to the images collected in Spain. Initially, the trip was intended to collect images of buildings linked to the Crusades, and was later extended to other places and monuments.

Louis de Clercq. Esch-scham. (Damas). Une vue intérieure du Château. c. 1859. Salted paper.

Louis de Clercq. Akka. (St. Jean d'Acre). Batterie des français. c. 1859. Salted paper.

Louis de Clercq. Jérusalem. Tour de David. Avec ses grandes assises salomoniennes.
c. 1859. Salted paper.

Louis de Clercq. Jérusalem. Portes dorées. c. 1859. Salted paper.

Louis de Clercq. Jérusalem. Porte de damas. (Bab-el-Ahmoud). c. 1859. Salted paper.

Louis de Clercq. Djiblet. Ruines d'un théâtre romain, extérieur.
c. 1859. Salted paper.

Louis de Clercq. Mont Carmel. Vue du Couvent. c. 1859. Salted paper.

Louis de Clercq. Kalaat-el-Markab. (Margat). Entrée intérieure & fenêtre
des Rois (ouest). c. 1859. Salted paper.

Pascal Sebah (1823-1886)

Photographer of Syrian-Armenian origin, who began his career as a photographer with Henri Bechard, with whom he received a medal at the Universal Exhibition in Paris. In 1857 he opened his own studio in Istanbul, called *The Orient.* Due to the strong demand for photographs of Egypt, between 1873 and 1880 he opened a second studio in Cairo. In the same year of 1873 he participated with his work in the Turkish pavilion at the Universal Exhibition of Vienna and illustrated the book *Les Costumes Populaires de la Turquie en 1873: ouvrage publié sous le patronage de la Commission impériale ottomane pour l'Exposition universelle de Vienne*, work of the painter Osman Hamdi Bey, which collected popular types of the Ottoman Empire. After his death his brother Cosmi continued with the studio, and in 1888 his son Jean Pascal took over the studio, who associated between 1888 and 1900 with Polycarpe Joailler, calling the studio *Pascal and Joailler,* obtaining in 1889 the recognition as photographers of the Prussian court, remaining open until 1952.

J. Pascal Sebah. Femmes fellahs c. 1860. Albumen paper.

J. Pascal Sebah. Fellahines portant de l'eau. c. 1860. Albumen paper.

J. Pascal Sebah. Tombeaux c. 1860. Albumen paper.

J. Pascal Sebah. Temple de Ouadi Seboua c. 1860. Albumen paper.

J. Pascal Sebah. Temple de Dakieh. c. 1860. Albumen paper.

J. Pascal Sebah. Femme fellah et son enfant.
c. 1860. Albumen paper.


Femme fellah et son enfant.
P. Sébah phot.

J. Pascal Sebah. Epicier. c. 1860. Albumen paper.

J. Pascal Sebah. Sakkas. c. 1860. Albumen paper.

J. Pascal Sebah. Sphinx Armachis. c. 1860. Albumen paper.

J. Pascal Sebah. Denderah temple pris du Sud c. 1860. Albumen paper.

Antonio Beato (1834-1906)

Italo-British photographer, brother of fellow photographer Felice Beato, with whom he worked occasionally. In 1853, together with his brother, he collaborated in Malta with the also photographer James Robertson, who had married his sister Matilda. Although not much is known about him, he is known for his photographs of Egypt and other places in the eastern Mediterranean, in which he captures both urban and natural views, monuments and popular types. In 1858, with his brother and brother-in-law, he moved to India, where he documented the Sepoy rebellion, moving later to Malta and in 1859 to Cairo and Luxor in 1862, where he opened a photographic studio, partnering at the end of the decade with the French photographer Hippolyte Arnoux.

Antonio Beato. Perspectiva del palacio de Dolmabaçe. c.1860. Albumen paper.

Antonio Beato. Templo de Qurna. c. 1860. Albumen paper.

Antonio Beato. Ramesseum. c. 1860. Albumen paper.

Antonio Beato. Sin título. c. 1860. Albumen paper.

Antonio Beato. Luxor. c. 1860. Albumen paper.

Antonio Beato. Catarata. c. 1860. Albumen paper.

Antonio Beato. Vista del templo. c. 1860. Albumen paper.

Claude-Joseph Portier (1841-1910)

Photographer of French origin, trained with the photographer Auguste Belloc, who in 1863 was part of the French Photographic Society. Between 1863 and 1882 he established a photographic studio in Algeria, being one of the first artists to open a studio in Algeria, a region that had not aroused the interest of other places in the eastern Mediterranean. In his work he collected urban and monumental views as well as popular types of the region, images that he compiled under the title *L'Algérie pittoresque*. In 1867 he participated with his photographs in the Universal Exposition of Paris, in 1878 he became the Algerian correspondent of the Giraudon Company of Paris, together with the also photographer Jean Geiser, selling his studio in 1888 to the photographer Alexander Leroux.

Claude-Joseph Portier. Algérie Pittoresque. Oasis de Biskra «au Sud de Constantine». c.1863. Albumen paper.

Claude-Joseph Portier. Panorama d'Alger. c. 1863. Albumen paper.

Claude-Joseph Portier. Le Desert, Alger. c.1863. Albumen paper.

Joseph Augustin Pedra (1809-1879)

French photographer, of Spanish origin, who around 1857 settled in Tlemcim (Tremecén), Algeria, an important tourist center of the country thanks to its Roman ruins, where he hosted the French photographer Gustave de Beaucoprs in 1859. Pedra's images were used by De Lorral to illustrate his book *Le Tour du Monde, voyage à Tlemcem.* The bulk of his work is preserved at the Ecole Supérieure des Beaux-Arts in Paris.

Joseph Pedra. Le port d'Alger. c. 1860. Albumen paper.

Wilhelm Hammersmith (c. 1830-1869)

German photographer with a studio opened in Berlin in the 1950s, and who around 1860 settled in Cairo, opening a studio there where he offered photographic materials for sale as well as his images of Egypt. In 1861 he participated in the exhibition of the French Photographic Society with 10 photographs of Egypt, becoming a member the following year. In addition to Egypt, Hammersmith made photographs in Nubia, Palestine, Lebanon and Syria. In his images he collected urban and natural views, monuments and popular types, part of which he showed again at the Paris Universal Exposition of 1867, and he also captured with his camera the inauguration of the Suez Canal.

Wilhelm Hammersmith. Deuxième pyramide de Ghyzeh. c.1860. Albumen paper.

Wilhelm Hammersmith. Vue de pyramides. c.1860. Albumen paper.

Wilhelm Hammersmith. Citadelle du Caire, vue du nord. c.1860. Albumen paper.

Wilhelm Hammersmith. Temple Hypaethrali a Phylae. Nubie, 1er Cataraete. c.1860. Albumen paper.

Wilhelm Hammersmith. Temple de Karnak premiere Pylone vue du Nord. c.1860. Albumen paper.

Hermanos Zangaki. Chaial porteur arabe. c. 1865. Albumen paper.

Zangaki brothers. George (c. 1845-c. 1895) & Constantinos (c. 1845-1916)

The brothers George and Constantinos Zangaki, of Greek origin, settled in Cairo, opening a studio in 1860, which remained open until 1890. They collaborated in Port Said with the French photographer Hippolyte Arnoux photographing the works of the Suez Canal, which were collected in the *Album du Canal de Suez*. Arnoux sued the Zangaki brothers in 1874 for fraudulently using his images, winning the lawsuit in 1876. Their images include urban and natural views, monuments, popular types and scenes of daily life, and were mainly intended for the demand of an incipient tourism. They also made photographs of different places and monuments in the Holy Land.

Hermanos Sangaki. Sakkie. c. 1865. Albumen paper.

Hermanos Zangaki. Promeneurs des linges.
c. 1865. Albumen paper.

Hermanos Zangaki. Vue generale des Pyramides. c. 1865. Albumen paper.

Hermanos Sangaki. Karnak. c. 1865. Albumen paper.

Hermanos Zangaki. Sin título. c. 1865. Albumen paper.

Hermanos Zangaki. Abydos. Isis. c. 1865. Albumen paper.

Hermanos Zangaki. Femme de Port Said. c. 1865. Albumen paper.

Hermanos Zangaki. Femmes arabes.
c. 1865. Albumen paper.

Hermanos Zangaki. Karnak Grand Porte. c. 1865. Albumen paper.

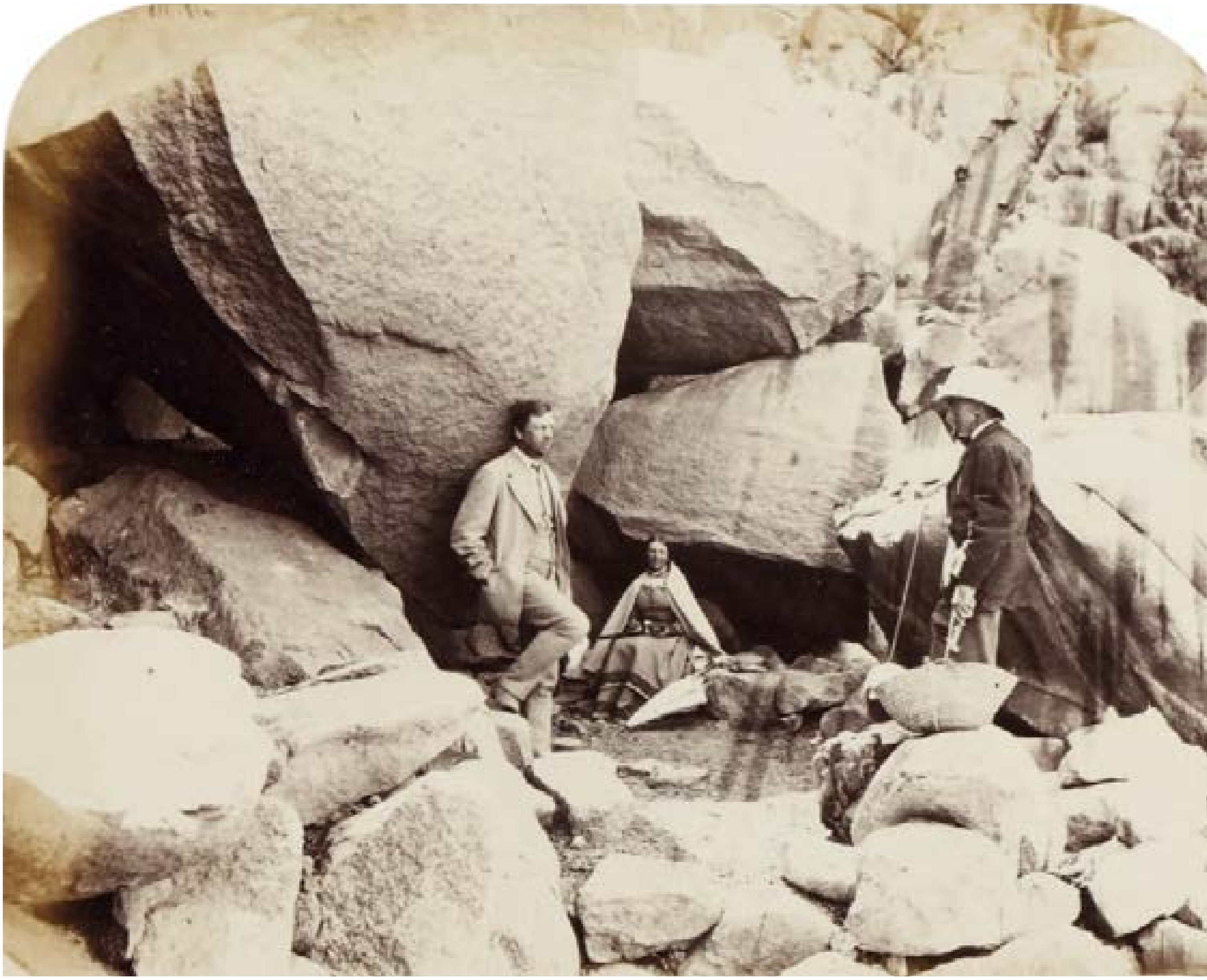
James MacDonald (1822-1885)

English photographer and military engineer, with the rank of sergeant, who illustrated with his photographs a report made between 1864 and 1869 of the Sinai Peninsula, in which Jerusalem was also included. The *Ordnance Survey of the Peninsula of Sinai,* was commissioned by the secretary of state for war of the British government with the aim of collecting the biblical sites of the Holy Land. The report was published in five volumes and in two phases, in 1871 the three volumes containing the photographs and in 1873 the remaining two. The photographs include natural and archaeological views of the Holy Land, mainly of the Sinai Peninsula, but also images of Jerusalem and other locations, which would prove the reality of the biblical accounts. However, the ultimate goal of the project was to provide military imagery and maps to the government for the sake of incorporating the territory into the British Empire at a time when the French government's attention was on the construction of the Suez Canal.

James Macdonald. The Bustan and Jebel Er Rabbeh. c.1868. Albumen paper.

James Macdonald. Ras Sufsafeh from the head of the plain of Er Rahah. c.1868. Albumen paper.

James Macdonald. Jebel El Watiyeh. c.1868. Albumen paper.



James Macdonald. Moses' well Jebel Musa. c.1868. Albumen paper.

James Macdonald. Ras Sufsafeh from north eastern extremity of the plain of Er Rahah. Monte Sinai. c.1868. Albumen paper.

James Macdonald. View from summit of Jebel Musa looking north. c.1868. Albumen paper.

James Macdonald. Jebel Katharina from summit of Jebel Musa.
c.1868. Albumen paper.

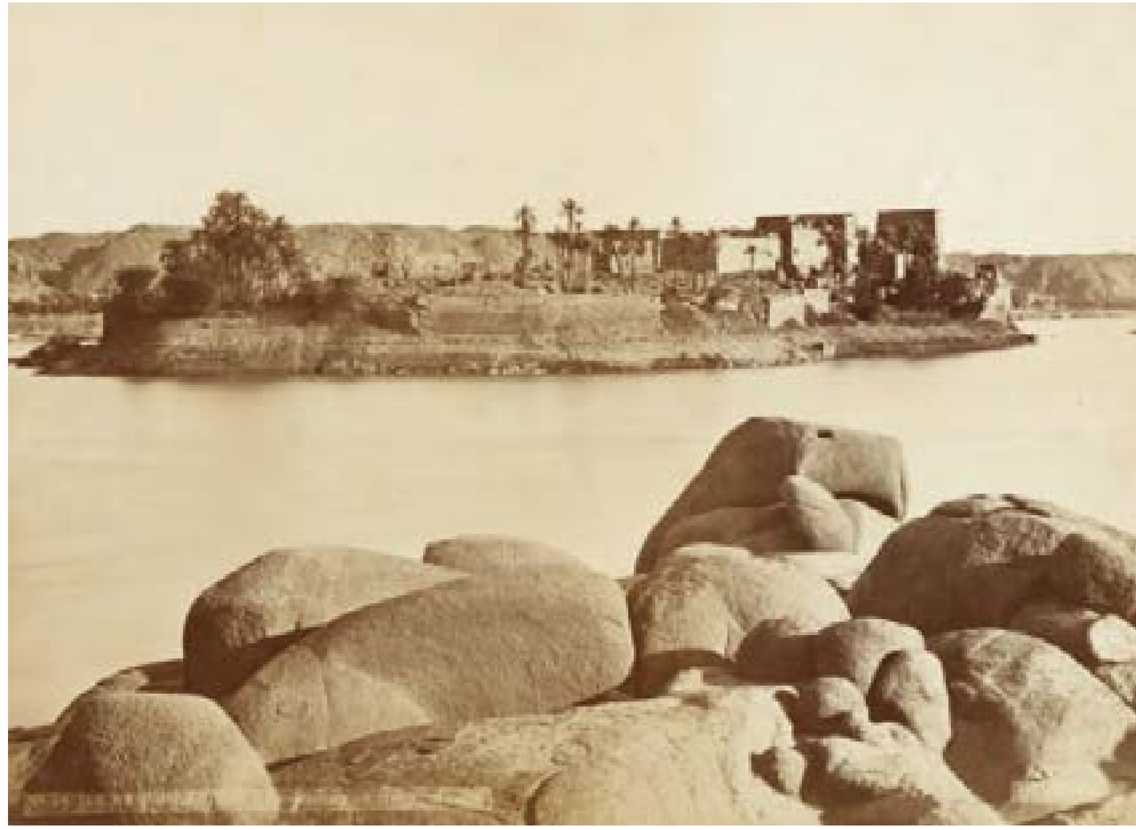
James Macdonald. Hajjar Musa (Moses' rock) in Wady Leja.
c.1868. Albumen paper.

James Macdonald. Summit of Jebel Musa from El Arbain.
c.1868. Albumen paper.

Henri Bechard (1830-1920)

French photographer who opened a studio in Cairo in the late 1960s, from which he devoted himself to photographing the ruins and monuments of Egypt, both Pharaonic and Muslim, as well as collecting popular types. He partnered with the Turkish photographer Pascal Sebah, with whom he exchanged images. He published part of his work in the album *L'Egypte et la Nubie* in 1888. He was the brother of fellow photographer Emile Bechard.

Henri Bechard. Tombeaux des califes. c.1860. Albumen paper.



Henri Bechard. Ile de Philae. c.1860. Albumen paper.

Henri Bechard. Catarate d´Assuan. c.1860. Albumen paper.

Henri Bechard. Foret de Palmiers. c.1860. Albumen paper.

Henri Bechard. Karnak. Vue prise du Nord Est. c.1860. Albumen paper.

Henri Bechard. Temple de Denderah. c.1860. Albumen paper.

Henri Bechard. Philae. c.1860. Albumen paper.

Henri Bechard. Medinet Abou Colonnes de L'Eglise Copte. c.1860. Albumen paper.

Henri Bechard. Medinet Abou. c.1860. Albumen paper.

Henri Bechard. La Grande Pyramide. c.1860. Albumen paper.

Henri Bechard. Pyramide de Chephren et de Mycerinus. c.1860. Albumen paper.

Henri Bechard. The Great Pyramid of Cheops. c.1860. Albumen paper.

Frank Mason Good (1839-1928)

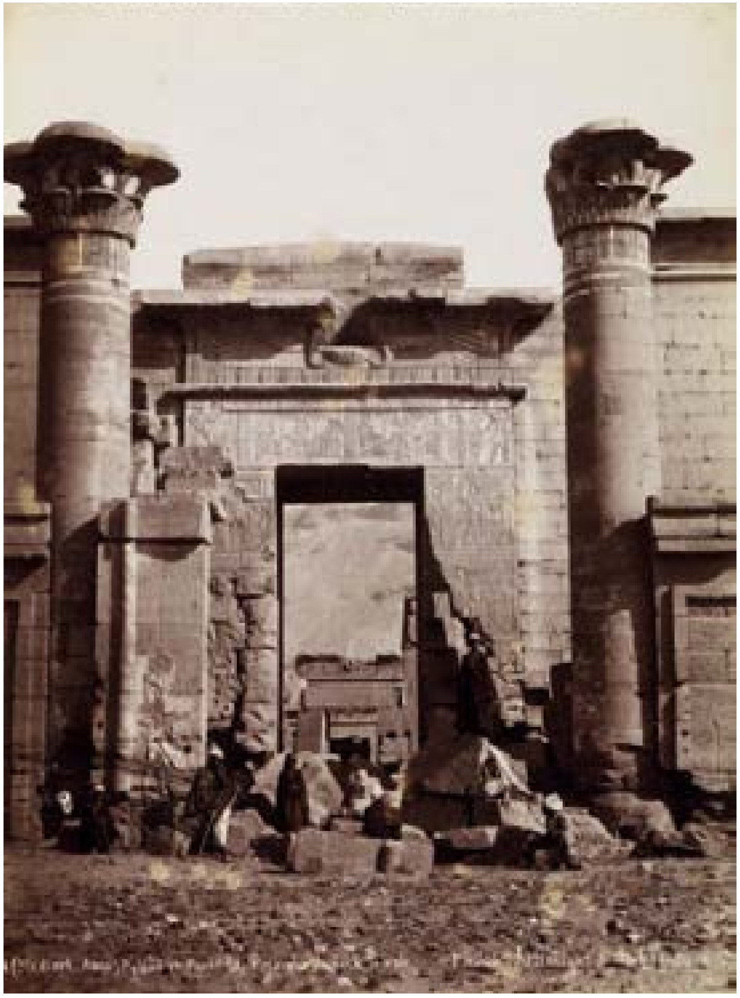
Photographer who made several trips to the eastern Mediterranean in the 1960s and 1970s, touring Greece, Turkey, the Holy Land and Egypt, the first of which was to Egypt in 1857 as assistant to photographer Francis Frith. In 1864 he joined the French Photographic Society, being in 1880 juror of its exhibition. Finally he settled in London, as a photographic editor. Along with his photographs of the Orient, a collection of stereoscopic views of Spain is also preserved. Part of his work appears in the album *Treasure Spots of the World, A selection of the chief beauties and wonders of nature and art*.

Frank Mason Good. Constantinople. c.1865. Albumen paper.

Frank Mason Good. Algiers. c.1865. Albumen paper.

Frank Mason Good. Sin título. c.1865. Albumen paper.

Frank Mason Good. Sin título.
c.1865. Albumen paper.



Gabriel Lekegian (1853-1920)

Painter and photographer of Armenian origin who had an open studio in Constantinople and Cairo in the 80's and 90's under the name of *Photogaphie Artistique G. Lekegian & Cie.* His images capture the life of the Ottoman Empire, its urban and monumental views, its popular types, as well as its politicians and rulers, being photographer of the Egyptian royal family, as well as official photographer of the Anglo-Egyptian army from 1883. Many of his images suffer from an orientalist vision to the taste of the European public to which they were addressed. Part of his work was published in 1880 in the *album Photographs of Egypt showing Cairo, Luxor and the Nile Banks.* He participated with his work in exhibitions and international fairs, receiving in the Universal Exhibition of Paris of 1889 a medal for his images, and in the World Columbian Exposition of Chicago of 1893 the first prize.

Gabriel Lekegian. Medinet Abou. c. 1880. Albumen paper

Gabriel Lekegian. Luxor. c. 1880. Albumen paper.

Gabriel Lekegian. Mendinet. c. 1880. Albumen paper.

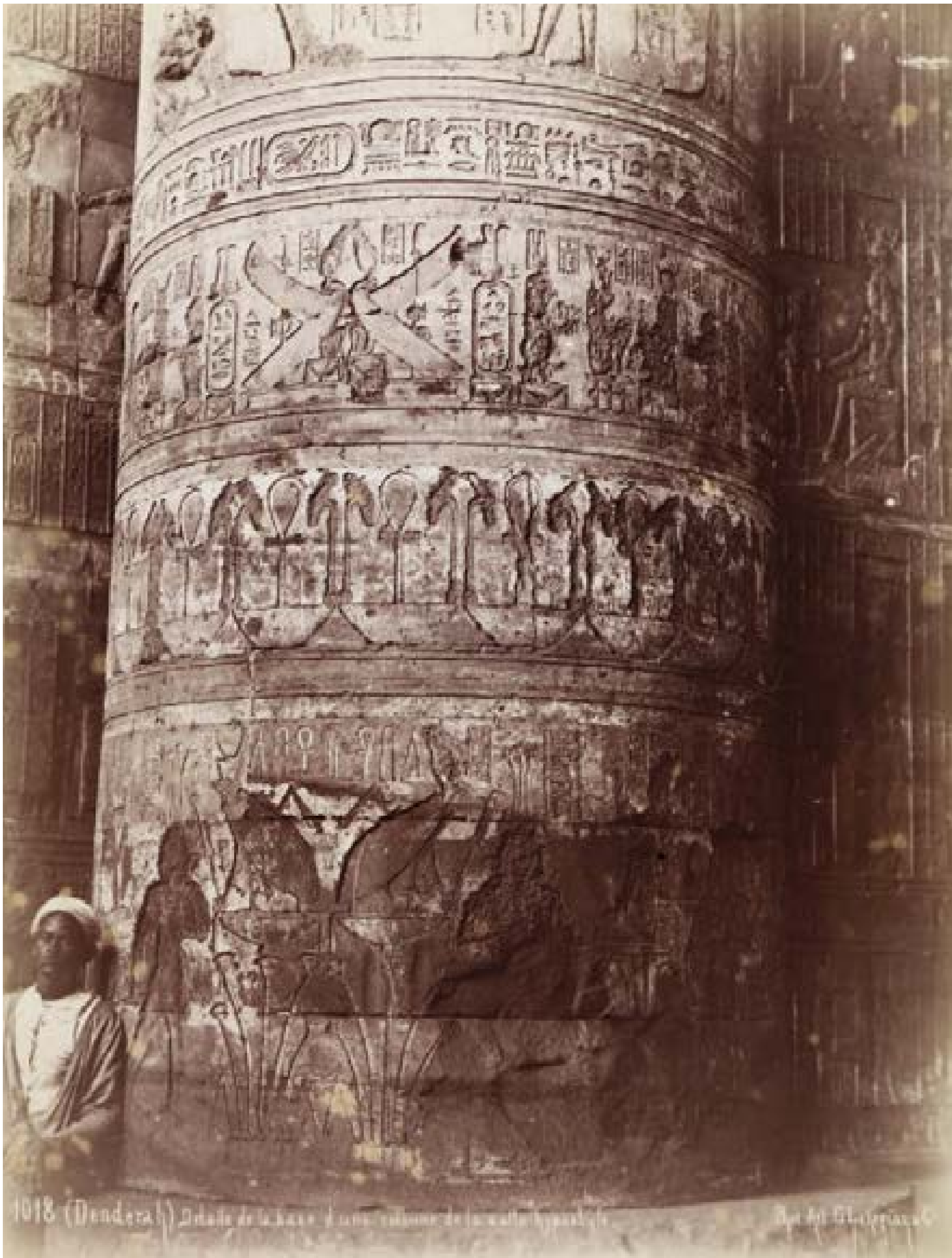
Gabriel Lekegian. Temple Rammeseum. c. 1880. Albumen paper.

Gabriel Lekegian. Dendereh. c. 1880. Albumen paper.

Gabriel Lekegian. Abydes. c. 1880. Albumen paper.

Gabriel Lekegian. Medinet Abou. c. 1880. Albumen paper.

Gabriel Lekegian. Sin título. c. 1880. Albumen paper.



Gabriel Lekegian. Dendereh. c. 1880. Albumen paper.

Adolphe Braun (1812-1877)

French photographer and textile designer who started in photography by making shots of flowers to be applied in textile designs. In 1857 he opened a photographic studio with his sons Henri and Gaston in Alsace, called *Braun and Co.*, which produced a large number of images marketed in the studio itself, which he expanded in 1868 with a second studio in Paris. He traveled throughout Europe, including Spain, collecting both urban and natural views, as well as monuments and portraits, and also dedicated himself to the reproduction of works of art, using the technique of direct charcoal. He photographed the Franco-Prussian war of 1870, with special dedication to the destruction of infrastructures. Later he was commissioned to photograph the construction of a railroad tunnel in the Alps. In 1869 he was invited to photograph the inauguration of the Suez Canal in Egypt. Upon his death, his son Gaston took over the studio.

Adolphe Braun. Sin título. c.1870. Albumen paper.

Etienne Neurdein (1832-1918)

French photographer, son of fellow photographer Louis Desiré Neurdein, who trained in the family studio. In 1864 he opened a studio in Paris, *Neurdein et Cie,* dedicated mainly to studio portraits. In 1870 Neurdein took a turn in his production, traveling to Algeria where he made reports on the ruins of antiquity existing in the country, commercializing them already in 1875 in the form of postcards, signed with the initials ND, destined to the incipient tourism in the country and to the Paris studio. In 1885 he joined with his brother Louis Antonin (1846-1914) to form the *Neurdein freres* company specialized in the publication and sale of postcards, for which he hired photographers who traveled around Europe and Algeria to take the pictures, which were later edited in Paris. The company was also in charge of photographing the Paris Universal Exhibitions of 1888 and 1900.

Etienne Neurdein. Ruines Romaines de Thamugas. c.1880. Albumen paper

Etienne Neurdein. Ruines Romaines de Thamugas. c.1880. Albumen paper.

Etienne Neurdein. Environs de Biskra. c.1880. Albumen paper.

Etienne Neurdein. Environs de Biskra. c.1880. Albumen paper.

Schroeder & Cía.

Swiss photographic company operating in the last quarter of the 19th century, of which images of the Alps and mountain views are preserved. At one point he moved to Egypt, where he shot urban and monumental views, both from the Pharaonic and Muslim periods, as well as portraits of popular types.

Schroeder & Cia. Thèbes les colosses de Memmon. c.1880. Albumen paper.

Schroeder & Cia. Karnak. c.1880. Albumen paper.

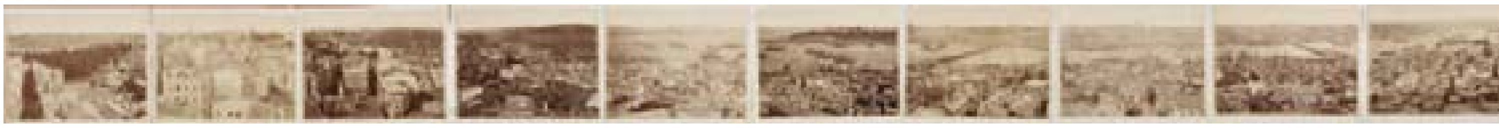
Schroeder & Cia. Karnak. c.1880. Albumen paper.

Schroeder & Cia. Edfou. Le gr Pylone. c.1880. Albumen paper.

Félix Bonfils. Mer morte. c. 1870. Albumen paper.

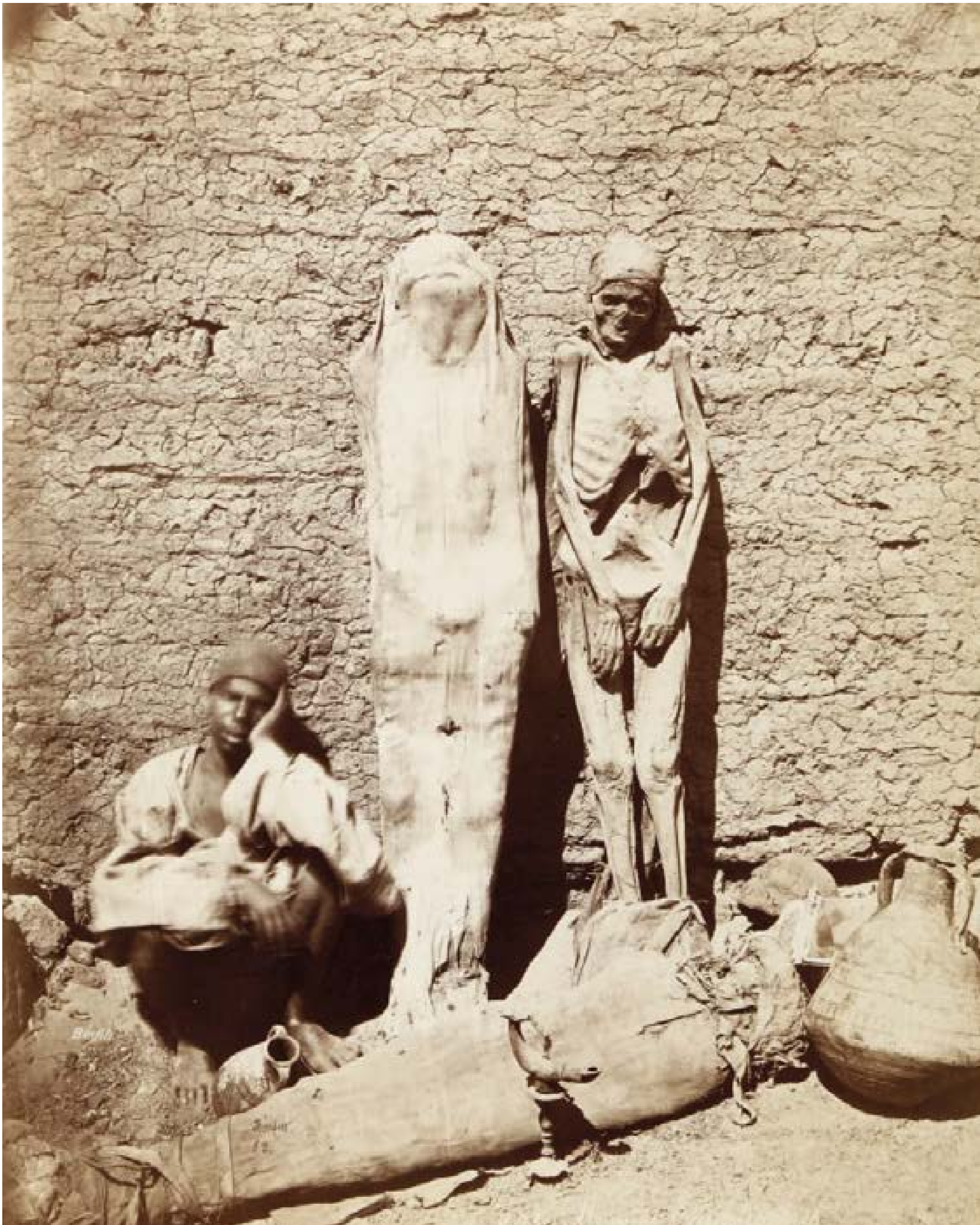
Felix Bonfils (1831-1895)

French photographer who in 1860 took part in General d'Hautpoul's expedition to Lebanon. In 1867 he decided to settle in Beirut, opening a photographic studio, Maison Bonfils, which in 1878 was renamed *F. Bonfils & Cie.* At the same time that there would be a branch in Ales, France. It was one of the most productive studios in the Orient, where the photographer worked with his wife Lydie (1837-1918) and his son Adrien (1861-1929), as well as with other photographers. From the studio they not only took photographs of Lebanon, but traveled throughout the eastern Mediterranean: Greece, Turkey, Syria, the Holy Land and Egypt, capturing in their works urban and natural views, monuments and popular types, mostly intended for tourism. In 1872 he published 50 of his images in the album *Architecture Antique. Egypte, Grèce, Asie Mineure. Album de photographies*, edited by Ducher, the same year he had presented his works at the exhibition of the Société Photographique Française. For the Paris Universal Exposition of 1878 he presented five albums of photographs, each containing 40 images, entitled *Souvenirs d'Orient: album pittoresque des sites, villes et ruines les plus remarquables de la Syrie et de la Cote de d'Asie.* Upon his death, his son Adrien continued the work of the studio, followed by his wife Lydie, until her death in 1918. Under their direction, the Bonfills studio incorporated new photographic techniques, such as color and photochromy.



Félix Bonfils. Constantinopla. c. 1870. Albumen paper.

Félix Bonfils. Momies égyptiennes.
c. 1870. Albumen paper.



Félix Bonfils. Le Caire, les tres pyramides. c. 1870. Albumen paper.

Félix Bonfils. Le Sphynx. c. 1870. Albumen paper.

Félix Bonfils. Bas relief à la partie postérieure . c. 1870. Albumen paper.

Félix Bonfils. Le Caire. Pyramide. c. 1870. Albumen paper.

Félix Bonfils. Vendeurs. c. 1870. Albumen paper.

Félix Bonfils. Buste de femme fellah. c. 1870. Albumen paper.

Félix Bonfils. Statue de Ramsses II. c. 1870. Silver emulsion.

Félix Bonfils. Egyptien. c. 1870. Albumen paper.

Félix Bonfils. Palmyre. Colonne monolithe. c. 1870. Albumen paper.

Félix Bonfils. Karnak. Pylone. c. 1870. Albumen paper.

Félix Bonfils. Caire pres du Mokkatam. c. 1870. Albumen paper.

Félix Bonfils. Temple de Abydos. c. 1870. Albumen paper.

Félix Bonfils. Le Caire. Tombeaux des Califes. c. 1870. Albumen paper.

Félix Bonfils. Marchand. c. 1870. Albumen paper.

Félix Bonfils. Balbek.
c. 1870. Albumen paper.

Félix Bonfils. Karnak. Avenue centrale.
c. 1870. Albumen paper.

Félix Bonfils. Bas relief dans le temple de Karnak.
c. 1870. Albumen paper.

Félix Bonfils. Egypte. Bas reliefs dans la 2 cour. c. 1870. Albumen paper.

Félix Bonfils. Phylae. 1 Pylone du Temple. c. 1870. Albumen paper.

J. André Garrigues (1848-1923)

French photographer who established a studio in Tunisia in the 80s and 90s, becoming the official photographer of the Bey of Tunis. In his work, with which he won numerous awards and recognition, he collected urban views and landscapes, monuments and popular types as well as nudes, some of which he colored. Some of his images are signed as *J. Garrigues* or *Photo Garrigues. Tunisia.*

André Garrigues. Campament. c. 1870. Albumen paper.

André Garrigues. Jeune Bedouine. c. 1870. Albumen paper.

André Garrigues. Extérieur de la Grande Mosquée à Kairouau. c. 1870. Albumen paper.

André Garrigues. Mauresque pauvre. c. 1870. Albumen paper.

André Garrigues. Jeune bedouine. c. 1870. Albumen paper.

Soler. Gourbi. c. 1865. Albumen paper.

Soler

Photographer of whom we have not found hardly any information about his life or activity, only that he photographed Tunisia in the last quarter of the 19th century. By the surname he is supposed to be French or Spanish, although most of the photographers working at this time in Tunisia are French because this territory was a French protectorate.

Soler. Type Tunisien. c. 1865. Albumen paper.

Jean Geiser (1848-1923)

Swiss photographer and editor, son of the photographers Lucien Jacob Geiser and Julie Delot, who lived in Tunisia, where he established a studio from which he photographed Tunisian life, customs, monuments and popular types. He also made reports on Algeria and Morocco, all of them included in the orientalist current that became popular at that time. His father was associated in 1857 with Jean Baptiste Alary (1810-1867), under the name of *Alary & Geiser,* and after the death of both it was Geiser's widow and later his son, who took charge of the company.

Jean Geiser. Untiled. c.1860. Albumen paper.

Jean Geiser. Cavalier arabe. c.1860. Albumen paper.

Jean Geiser. Chameaux. c.1860. Albumen paper.

Jean Geiser. Negro musicien. c.1860. Albumen paper.

Jean Geiser. Mauresques dans leur intérieur. c.1860. Albumen paper.

Antonio Cavilla (1867-1908)

Photographer born in Gibraltar who trained with his uncle Alexander, partner of the *Cavilla Bruzón* studio in Gibraltar. He opened a studio in the city of Tangier, in Morocco, being one of the first photographers who paid attention to this territory. Between 1885 and 1890 he was associated with Antonio Molinari, after which he established himself alone. He specialized in the execution of photographs for tourists visiting Morocco, especially postcards, also working for the press.

Anthony Cavilla. Water Carrier. c.1880. Albumen paper.

Anthony Cavilla. Tánger. 1897. Albumen paper.

Lehnert and Landrock. Rudolf Franz Lehnert (1878-1948) **& Ernst Heinrich Landrock** (1878-1966)

Photographic studio run by Rudolf Franz Lehnert, of Austrian origin, and Ernst Heinrich Landrock, of Swiss origin. Lehnert first traveled to Tunisia in 1904, at which time he partnered with Landrock, opening a studio in Tunis. They subsequently opened new locations in Munich, Leipzig and Cairo. Like other studios opened at this time, his work collected urban views, landscapes, monuments and popular types of these countries for the consumption of both the incipient tourist and the European public. His works are signed *Lehnert and Landrock*.

Lehnert & Landrock. The Pyramids of Giza. c. 1905. Heliogravure.

Lehnert & Landrock. General view. c. 1905. Heliogravure.

Lehnert & Landrock. Mamelouk Toms and Citadel. c. 1905. Heliogravure..

Lehnert & Landrock. General view. c. 1905. Heliogravure.

Lehnert & Landrock. The Pyramids of Giza. c. 1905. Heliogravure.

Lehnert & Landrock. Sphinx and Pyramids. c. 1905. Heliogravure.

Ed Cosmos. Pavilion of Rameses III at Medinet Habou. c.1890. Heliogravure.

Cosmos Ed.

Publishing house that produced heliogravures, obtained by substituting the lithographic stone for a photosensitized copper plate where the direct camera negative was collected, which were later used mechanically for publication in the graphic press. The images depict Egyptian life and customs, including urban and natural views, monuments and popular types.

Ed Cosmos. Temple of Sethi at Abydus. c.1890. Heliogravure.

Ed Cosmos. Colossi of Memnon at Thebes. c.1890. Heliogravure.

Ed Cosmos. Temple of Terraces at Der El Bahari. c.1890. Heliogravure.

Photocrom Zürich

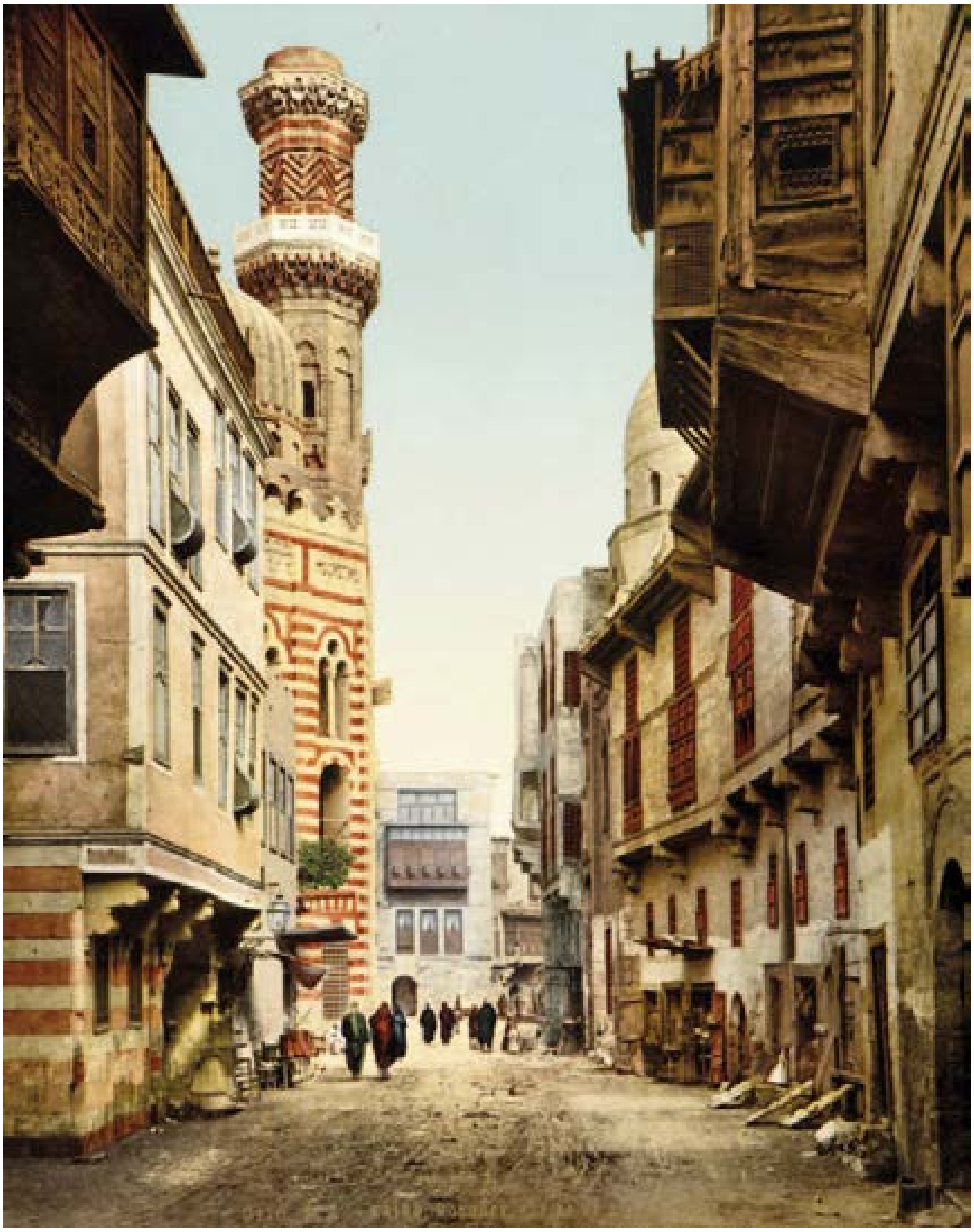
Company created in 1880 for the development and commercialization of color photographs by the Swiss company Orell Gessner Fússli, from the invention of one of its employees, Hans Jacob Schmid (1856-1924), of a procedure to obtain color images from the combination of the negative of black and white photographs and lithographs. The company was later renamed *Photoglob Zurich AG.*

Photochrom Zürich. La riviere de El Gaztara. c. 1888. Photochrome.

Photochrom Zürich. Kairo. La Citadelle. c. 1888. Photochrome.

Photochrom Zürich. Lydda. c. 1888. Photochrome.

Photochrom Zürich. Palestine, Le Jourdain. c. 1888. Photochrome.



Photochrom Zürich. Kairo. Rue au Quartier Arabe. c. 1888. Photochrome.

Photochrom Zürich. Kairo. Rue pavoisée.
c. 1888. Photochrome.

Photochrom Zürich. Kairo. Vendeurs d'eau fraîche dans les rues. c. 1888. Photochrome.

Photochrom Zürich. Jeune femme de Bethlehem. c. 1888. Photochrome.

EPILOGUE

1839: BETWEEN THE DAGUERREOTYPES AND THE CALOTYPES AND THE VIEWER'S JUDGMENT, THERE WAS (AND IS) THE IMAGINATION

Principles for an Anthropology of the Photographic Action in the Sciences, the Arts, Commerce and Travel

Rafael Llano S. Álvarez-Pedrosa

> The Daguerreotype has fixed the most fleeting of our illusions, that which the apostle and the philosopher and the poet have alike used as the type of instability and unreality. The photograph has completed the triumph, by making a sheet of paper reflect images like a mirror and hold them as a picture.
>
> O. W. Holmes, "The Stereoscope and the Stereograph", *The Atlantic Monthly* no. 3 (June, 1859)

Publication of the scientific findings of Daguerre and Talbot

Photography has been one of the most original contributions of empirical sciences to the culture of our civilisation, as noted by the creator of the contemporary tales of policing and terror, E. A. Poe (1840), when he saluted the daguerreotype as "the most important, and perhaps the most extraordinary triumph of modern science".

One year earlier, the *Académie des sciences* had appointed a commission to assess the heliographic reproduction method of images presented by M. Daguerre. Its members, F. Arago, Jean Baptiste Biot and Alexander von Humboldt, submitted their conclusive report to the members of the Academy on 7 January 1839. The *Gazette de France* anticipated the unconditional scientific endorsement which these academicians granted it, publishing the scoop in a wide-ranging report one day earlier, on 6 January 1839. Its translation appeared the following week in *The Literary Gazette*; *and Journal of the Belles Lettres, Arts, Sciences*, in London (no. 1147, 12 June 1839). This must have been how Talbot learned of the existence of a heliographic method that differed from his own, accepted by and presented before the sages of Paris. Shortly thereafter the French State was to purchase the invention's patent from Daguerre in exchange for a life pension of 6,000 francs. It thus meant to ensure "the glory of endowing the world of science and of art with one of the most surprising discoveries that honour our native land". Photography had been born to change not only the manner of dealing with art but also of doing science, and not only in France but throughout the world, in the opinion of the French Government.

Talbot was surprised, and also perturbed, that Daguerre's finding should be world famous before his own calotype, for it would have been so, if not for better at least for equally good reasons[1]. He thus mobilised his friends at the Royal Academy

1. Talbot, 1844. Brief Historical Sketch of the Invention of the Art.

(he was a great friend of Sir John W. Herschel) to urgently appeal to the distinguished academicians on 31 January of the same year. The theme of his intervention was "The Art of Photogenic Drawing"[2] —the title of his paper which did not explicitly set down the potential applications of his invention to the sciences, though he did discuss them in his address. He had spent almost ten years investigating a method to reproduce all kinds of images by heliographic means and he had achieved some extraordinarily significant results that needed to be brought to the attention of the sages. He refused to call his method by his own name as Daguerre had done and so proposed a neologism: *calotype*.

But although Talbot, with a few days' delay, set out on *le Tour du monde* with his calotype, shortly thereafter he achieved a breakthrough that placed him at the forefront of the culture of his time. History's first photographic book, *The Pencil of Nature* (1844) brought its author, Talbot, a degree of glory comparable to that of Gutenberg with his first printed Bible, said B. Newhall[3]. And it should also be noted that Talbot could, through this publication, show a personal difference —one that was also idiosyncratic of his nation's people— with regard to his French rival, which was that Talbot entrusted the advances of the calotype not to his nation's State, like Daguerre did to his, but to the talent of the English *—to the British talent*[4].

> The Author of the present work having been so fortunate as to discover, about ten years ago, the *principles* and *practice* of Photogenic Drawing, is desirous that the first specimen of an Art, likely in all probability to be much employed in future, should be published in the country where it was first discovered[5].

Advances in chemistry and optics that made them possible

Poe was right when he asserted that scientific research had made huge progress since the early 19th century, to the point of enabling the birth of photography. In his intervention before the Royal Academy in January 1839, and then in *The Pencil of Nature*, Talbot pointed to the works of Wedgwood and H. Davy on the action of light on salts, published in 1802 in the *Journal of the Royal Institution of Great Britain*[6], as pioneering in the invention of the art of photography, "despite their advances in this field being very limited".

A few years later one of the prime movers of contemporary chemistry, Jöns Jacob Berzelius, recorded in his *Traité de Chimie* (1808-1818) more than a hundred cases in which the action of the light produces changes in chemical substances, giving rise to new compounds, or readjustments in elements already united, crystallographic changes, mechanical breakdowns and modifications, etc.[7] The thorniest scientific problem in obtaining photographs was thus not how to activate changes and transformations in photosensitive substances but actually how to stop them from a certain moment onwards —how to fix those chemical changes to ensure the image's permanence in a specific state. Talbot remembered that, among his earliest concerns, a crucial one was in fact this one: discovering the *preserving process* that would allow him to fix the image obtained on paper through the action of the light[8].

But barely a year after Daguerre and Talbot had presented their inventions, John W. Herschel published in the *Philosophical Transactions* of the Royal Society dozens of new observations on all the key topics: limitation and setting of the chemical effects on the emulsified substrate of the calotype or the daguerreotype; the potential sensitivity of the papers prepared by Talbot and the possibility of developing them; on photography through direct contact (he had discovered the *cyanotype* method), and as many other issues relative to the invention's photochemistry and to the best procedures for successfully activating and deactivating them on iodised plates. Chemical science had found satisfactory responses to the major demands of Photography, before, during and barely after having presented the new medium before *les savants*.

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2. Talbot, 1839 [1980: 23, 30].

3. Cit. en Schaaf, 2012: 99.

4. Talbot, 1844, comment to Plate VI. The Open Door. Also letter from W. H. F. Talbot to William Jerdan, London, 23 June 1844 (Schaaf, 2000)

5. Talbot 1844, Introductory Remarks. The underlining is mine.

6. "An Account of a Method of Copying Paintings Upon Glass, and of Making Profiles, by the Agency of Light Upon Nitrate of Silver", repr. in Newhall, 1980: 15-16. Cited by Talbot, 1839 [1980: 23- 24]; and 1844, Brief Historical Sketch of the Invention of the Art.

7. Draper, 1840: 22.

8. "At the very commencement of my experiments upon this subject, when I saw how beautiful were the images which were thus produced by the action of light, I regretted the more that they were destined to have such a brief existence, and I resolved to attempt to find out, if possible, some method of preventing this, or retarding it as much as possible." Talbot, 1839 [1980: 24-25]. Also Talbot 1844, Brief Historical Sketch of the Invention of the Art.

The other field of the empirical sciences that needed to progress in order to give rise to Photography was Optics. In his comment to Plate III of his *The Pencil of Nature* [Schaaf no. 66], Talbot explained it thus: “It may be said that the camera makes a picture of everything it *sees*. The object glass is the *eye* of the instrument, the sensitive paper may be compared to the *retina*”. Were it not because, in a later comment, Talbot clarifies that he applies these bodily terms to the camera by way of a metaphor[9], we would have to point out the unsuitability of the expression “what the camera sees” referred to the obscura or the photographic camera. But what is important is what Talbot then adds about the optic: “However, the eye should not have too large a *pupil*, that is to say, [the diameter of] the glass should be diminished by placing a screen or diaphragm before it, having a small circular hole through which alone the rays of light may pass. When the eye of the instrument is made to look at the objects through this contracted aperture, the resulting image is much more sharp and correct. But it takes a longer time to impress itself upon the paper, because, in proportion as the aperture is contracted, fewer rays enter the instrument from the surrounding objects, and consequently fewer fall upon each part of the paper”.

Talbot already points out one of the dialectics between opposites, key to photographic production: the one occurring between the sharpness of the image and the time of exposure to the light (in equal photosensitivity conditions of the emulsifiable substances, and of light intensity). This means that the amount of light is not a univocal factor for the production of defined photographic images; that this quantity has to be multiplied by the inverse of the amount of exposure time; and all this, furthermore, multiplied by the (non-quantifiable) variable of the quality of the composition of lights, through tones and shadows that best favour the view of a body through its image, and the intellectual grasp of what this indicates, also through the image.

But again, barely a year after having presented photography before the most distinguished scientists, optical research had already provided the essentials for it to work correctly. This was pointed out by Herschel (1840), referring to his own experience: “As for the camera lens, the one I employed was neither periscopic nor achromatic, being in fact no other than the aplanatic crown-glass lens. This type of lens, though admirable for its original purpose as a burning-glass, is in fact one of the worst possible for a photographic camera, in which the three qualities of a flat field, a sharp focus at great inclinations of the visual ray, and a perfect achromaticity, are indispensable. The latter quality, indeed —he concluded— is even more necessary for photography than for the ordinary use of the camera obscura”.

Anthropological science in the time of the Enlightenment, mute before the image

However, while the chemical and optical sciences threw themselves into the newly emerged photographic medium, the neglect in which it was born and remained compared to anthropological science is hugely surprising. Which place should the photographic image occupy in human experience? How did it widen, or restrict, the various faculties of knowledge, and the emotional ones? Which human activity could most benefit from the newly discovered procedure: sciences and arts, like the French State professed to do, or commerce and entertainment, as occurred right from the start? Which social changes would photography produce?

Anthropology does not appear to have been prepared for this germination of photography in the field of empirical sciences. In 1798, namely shortly after his three *Critiques,* Kant had published his *Anthropology* lectures. In the prologue to this work he observed that there are two possible points of view from which this science can be cultivated. One is philosophical, he said, and investigates what nature operates in our body without us taking part in it. The other one is pragmatic and investigates what we ourselves can do according to what our body provides us with. Yet in neither of these viewpoints does the Kantian *Anthropology* concern itself with our cognoscitive, emotional and practical relationship with artificial images. When Kant discusses artistic taste in his *Anthropology*, he refers it to the “fine arts of the word”, and only on one occasion does he mention the rational use of imagination in the compositions of the plastic arts (Kant, 1798, § 31A).

Something similar occurs with the voice “Imagination”, which Voltaire drew up for the first edition of *L’Encyclopédie* (1766, volume 8, pp. 560-564). If anyone was able to use imagination with taste and ingenuity, he says, it was the great epic and tragic poets of Antiquity: Homer, Virgil, Horace. Voltaire does add the name of two painters apropos the imitative image, but they are ultimately nothing more than examples mentioned *en passant*. Most noteworthy, in my opinion, of that voice of his for the Encyclopaedia is the paragraph with which he ends, drawing our attention to the complexity of human realities signified by the common term of *imagination*:

9. Talbot, 1844, comment to Plate VIII, A Scene in a Library.

> Il n'est peut-être pas inutile d'ajouter à cet article, que par ces mots *perception, mémoire, imagination, jugement*, on n'entend point des organes distincts, dont l'un a le don de *sentir*, l'autre se *ressouvient*, un troisième *imagine*, un quatrième *juge*. Les hommes sont plus portes qu'on ne pense à croire que ce sont des facultés différentes & séparées; c'est cependant le même être qui fait toutes ces opérations, que nous ne connaissons que par leurs effets, sans pouvoir rien connaître de cet être[10].

I should like to provide in these notes some of the results which the anthropology that preceded that of the enlightened philosophers had done on perception, imagination, memory, intelligence and science, and on the mimetic and non-mimetic representation of the arts. I believe that it is not an anachronism to go to the sources, to Aristotle's philosophy of Nature. He is ultimately the father of the system of natural, human and social sciences that nourished our culture, certainly until the birth of photography. It is true that his Astronomy had already been definitively surpassed by Newton's *Philosophiae naturalis principia mathematica*. And that research by Boyle, Lavoisier and Dalton had definitively displaced *chemistry* from the "five natural elements" admitted by the pre-Socratic philosophers and by Plato and Aristotle himself. But here we will not be discussing Astronomy or Chemistry but Anthropology. And in this territory, the analysis of the five faculties of external sensitivity, plus the internal sensitivity in the present (imagination) and that of the remembered past (memory), plus its articulation with intellectual grasp, productive practice and artistic emotion, proposed by Aristotle, are present in Voltaire no less than in Kant, as they had been previously in Locke, for example (*An Essay Concerning Human Understanding*, 1689, Book I, chaps. IX, X). Both to accept it and to reject it, the philosophy of the nature of man, of his knowledge and his intellectual, productive and emotional capacity, had in the West followed the outline provided by the Stagirite, as we will see apropos of the actual observations made by the fathers of photography and their travel companions —those devotees of photography who were not infrequently also their main critics.

Physics of sight

The physical, biological and anthropological principles that we believe are relevant for remembering here apropos the photographic image refer firstly to sight. It is one of the five powers of sensitive perception that occur in animals[11]. Not all species are capable of sight, hearing, smell, taste and touch. This last one is not missing in any of them. And sight is always present together with the other four —it is its apex, as it were. It is an activity inherent to superior living beings; a clam or a worm have perception but it does not appear that they can see the way the mouse, the bison or man do.

From the physical point of view sight involves, firstly, a light source (solar, lunar, artificial light). The first and principal physical setback in making photography possible is this: light and no light. Not for nothing was the gadget that preceded the photographic camera known as *camera obscura*. One had to confront a private space of light (the one contained by the camera obscura) with the light that illuminates and is reflected in all the bodies of the physical world to obtain a photographic image. This results from a relative limitation of the light, which will enter the camera according to how much it is allowed to do so by the greater or lesser aperture of the shutter. In light there are no shadows, nor are there any in darkness, but the camera obscura, open to the light for a few seconds, engenders them. These shadows act on the emulsifiable substances placed on the plate or paper, at the back of the camera, and produce visible images in all the intermediate tones between totally white light and totally black darkness. "Light and shadows, divested of all colour"[12].

Still from the physical viewpoint, Aristotle points out the importance of the medium of sight. It does not occur through physical contact between the viewer and the viewed, as occurs, for example, between the toucher and the touched. It requires a substance or support —air, water— situated between the surface of the visible bodies and the surface of the sight organ. That medium has to feature the property of being transparent, amorphous (not limited by surfaces) and invisible. A stone is not a medium for vision, for no matter how much illumination we apply, it will not be pierced by light beams. But air is, the air that enwraps us, the photographic

10. It may perhaps serve some purpose to add to this article that by these words: perception, memory, imagination, judgment, we do not understand different organs, of which one has the gift of feeling, another one remembers, a third one imagines, a fourth one judges. Men are more prone than we think to believe that they are different and separate faculties; yet it is the same being who performs all these operations that we only know by their effects, without being able to know anything about this being.

11. Aristotle, *Περι ψυχής*, B, VI- Γ, I. Also Kant, 1798, §§15-16.

12. Talbot, 1839 [1980: 28]. Italics by Talbot.

camera, Lacock Abbey and the Paris boulevards. We do not see air, but we do see what is visible through it: the abbey, the boulevards. The aqueous humour contained in our eye behind the cornea is also transparent, no less than the air entrapped within the camera obscura. For those mediums to precisely transmit the entire chromatic spectrum of luminous rays they also have to be achromatic, observed Aristotle. Only then can they be updated as such, equally by a kind of colour (red) and by its opposite (blue). And they have to be illuminated instantly as such by the light source. In the depths of a cave, or in a fully darkened space, we can now open our eyes, or the camera's shutter, and no vision or chemical emulsion whatsoever will occur because the medium of vision is not updated as such. But "in" light the vision of physical bodies occurs, and "in" light the vision of a photograph or of a painting. Instant vision is not "of" the light but occurs "through" it and "in" it.

Thirdly, and lastly, sight, and the photosensitive emulsion of the photographic plates or papers, require the surfaces of bodies. This, too, is a precision of common experience, which Aristotle recalls in *On the Soul*. Enveloped in fog, or surrounded by mountains covered in pristine snow, we see nothing in a differentiated manner beyond a homogeneous extension of more or less white light. If we are lacking the physical surfaces on which are reflected the luminous rays instantly transmitted by the colourless and transparent medium, nothing discriminates our vision. Nor can we differentiate lights, half tones and shadows in the photosensitive emulsion spread over the daguerreotype, the calotype paper or any other photographic support.

Talbot had, with the pride of the inventor, asserted that Lacock Abbey had been the first physical body to have been self-represented[13]) in a calotype drawing: "This building I believe to be the first that was ever known to have drawn its own picture"[14]. All the visible surfaces of the Abbey and those of its surroundings, flooded in English summer light, were made visible: physical body against printed body, physical facies against printed facies, in the same proportion between parts and analogous state of lights, shadows and half tones, in nature and in the calotype.

Thus far the physical preconditions for there to be sight in bodies capable of seeing, which are the same ones required by the emulsion differentiated from the photosensitive substance placed at the back of the camera.

Biology of sight

From a biological point of view, sight implies a living organism endowed with the external and internal organs suited to the nervous transmission of the differentials activated by the reflection on surfaces of the luminous rays that reach its body[15]. Atrophied external organs, such as the mole's, block vision. It would also be blocked by a lesion in the retina, the cornea or the optic nerve, or a brain injury. Vision involves the activation of all those living organs in an animal, as an effect of the light reflection on the bodies in its physical environment. However, these activations of the organs are not yet vision. We see activation neither in the eye, nor in the retina, nor in the optic nerve nor in the brain, when we perceive visually. Hence the metaphorical nature of the comparison proposed by Talbot, pointed out above. The camera lens is like the human eye; and sensitive paper like the retina, agreed; but this does not mean that the camera *sees*. The only being capable of seeing photographic images is man. I will not undertake to say how the rest of animal species see photographs. In any case, what is certain is that the camera does not *see* anything.

Still from the biological point of view, the memory which some animal species give signs of having invites us to think that they have developed, together with perception (visual, acoustic, tactile, olfactory, gustatory), the animic faculty of imagination. Aristotle deduces this because there are species capable of reacting in a singular and determined manner to previously perceived stimuli that are also determined and singular, of which they had a painful or pleasurable experience. A dog that has been well or badly treated by a person will much later recall the kind of treatment it received from that person and reacts accordingly, approaching or shying away from him. Trainable animals also give signs of having internal images, for they have memory, e.g. elephants trained in India remember the food rewards they are given by their *mahout* once they have raised and carried tree trunks according to his indications. These singular and determined reactions are different from those which, in each species, occur naturally to similar stimuli in all individuals. All swifts perceive and carry in the same way the materials that they find useful for making their nests, just like all bees seek out and find through perception and their instinct the pollen they require for making the nourishment for the larvae in their

13. Talbot, 1844, comment to Plate XV, Lacock Abbey in Wiltshire.

14. Talbot, 1839 [1980: 28]. Italics by Talbot.

15. Aristotle, *Περι ψυχής* , B, V. Also Kant, 1798, §19.

polis. In general, Aristotle summarises, the animals capable of remembering previous singular perceptions and of *learning* from them are those in which we have to presume imaginative capacity, for memory does not occur without images.

In his probing into the biological principles of animal species, Aristotle deduces that the activity of the imagination, which throws up images suitable for remembering, occurs simultaneously with each act of perception. In species endowed with memory (human included), each act of external perception (colours, sounds, smells, tastes, tactile qualities) leave in the imaginative faculty a *resemblance* (*homoĩa*) of the quality perceived in that instant. This animic faculty is not external, for it has no sensory bodily organs; Aristotle deduces that it is internal (also Kant, 1798, §. 24). Furthermore, that the principle of internal sensitivity capable of producing images similar to the instantly perceived qualities, and of recalling them after a time, has to be one and the same. Should this not be the case, one would have to presume another intermediate faculty between imagination and memory that would have to be activated to instantly articulate one with the other. But it is better to not multiply the animic powers without having to, Aristotle believes, for this would lead to an unlimited, never instantly traversable chain of intermediate powers. This is also recognised by Voltaire when he points out (1766) that the imagination is a gift of nature that cannot exist without memory, and of which we make instrumental use in all artistic inventions that are truly that.

Internal common sense, the principle of human imagination and memory

This principle of internal sensitivity is denominated *common sensibles*[16] by Aristotle. He says *common* because it is so to all perceptions of the five external senses. Internal sensibility stores images of what is perceived by sight, hearing, taste, smell and touch. And it not only stores them by juxtaposing them or stacking one image next to another but also links them up. The biologist from Stagira understood that internal sensitivity is capable of feeling which visual similarities correspond to the same physical body that, as well as the visual ones, have produced within ourselves another acoustic image, or a saporiferous, or an odorous or a tactile one. The internal common sense feels which similarities of a different kind correspond to the same physical case, and which do not. Otherwise no animal would ever feel that it is before the same corporeal individual capable of producing simultaneous visual, tactile and acoustic sensations.

Of course the photographic camera is not capable of doing this. To begin with, because it is impervious to anything other than the visible qualities of bodies, activated by light. Photographers were still to discover the cinema, and film producers how to splice the images and sounds produced by one and the same bodies, for photography to overcome its natural inability to simultaneously transmit all the heterogeneous sensations that one same body is capable of producing in us —at the very least, acoustic perceptions and images, although visionaries such as Val del Omar thought that film might be able to synergically transmit tactile impressions.

Aristotle[17] (and also Kant, 1798, §24) speaks of yet another two cognitive functions of internal common sense. One is the athematic perception of the act of external perception; the second, the hierarchisation of divergent or insufficient sensations. The former means that we not only perceive the external qualities of bodies in each act of perception but that we also perceive that we are perceiving. It is not that common sense again perceives internally what it has perceived externally through the bodily organs, like duplicating perceptible signals, but that the same signal is external and internal at the same time and makes us feel in a state of cognitive actuality. The internal common sense informs us sensitively that it is us, individually, who are perceiving qualities of a body that is not ours, nor are they those of our organs physically affected by the external action of those that are instantly perceptible. If this were not so, we would never know whether it is ourselves who are feeling the sensations or an instance different from ourselves, like a kind of magic box or phantasm that inhabits us but that is not as yet ourselves. The external act of perception would ultimately be as unconscious for us as the act of digesting or of blood flowing through us. Because we do not feel that the food is being digested by our digestive system, or that blood is flowing through our vascular system in the same way as we know, because we feel it, that we are seeing, hearing, smelling or touching certain perceptible qualities of a body that is not ours. Of each act of external perception, reinforced by the image it simultaneously leaves in our internal sensibility, we can say that it is ours (*mine*), *tout court*, just as we do not say, or at least not as assuredly, that the act of digestion is *mine*, or *mine* the act of pumping blood through my body. We instead

16. Aristotle, Peri psychēs, Γ, 425 a 27; 431 b 5. Peri mnēmēs kai anamnēseōs, 450 a 11. Peri hypnou kaì egrēgórseōs, 455 a 16, 20. Peri neótētos kai gērōs, 467 b 28. Peri zōōn moríōn, Δ, 686 a 31.

17. Aristotle, *Peri psychēs*, Γ, II.

say that our body is digesting or pumping blood, leaving out that "I" that is so present when we perceive a colour or a flavour: I, and not someone else, is the one perceiving it; and I, and not someone else, is the one tasting it. I, and not someone else, we could also say, am the one perceiving that photographic image. The camera, conversely, has no internal common sensitivity that allows it to feel and tell itself that the act of chemical emulsion is its own and no one else's. This is what Voltaire implies in the previously cited text of *l'Encyclopédie*, when he holds that we humans tend to think, when dealing with perception, that memory, imagination and judgment are separate faculties when in reality it is the same being who is performing all these operations. And even though, of this same being or subject who is recognised as one and the same actor in all these operations, we do not yet know who or what it is —as Voltaire ends his assertion— with each act of external perception (including the perception of a photograph), we surely know this of ourselves: that we are instantly sensitive cognizant subjects. Aristotle reinforces his assertion by pointing out that, were this not so, nor would we be able to distinguish the activity of perception during wakefulness from the imaginative perception during sleep. We can distinguish our activities of external perception from the activities of nocturnal dreaming, because with the former it is given to us to feel ourselves as subjects of the perception, but not so in dreams until we awaken.

But it is also true that disharmonies, insufficiencies and even errors occur in our external and internal perception of the qualities of bodies. The physical conditions of the medium (air, water) through which the sensitive causation reaches us; or the state of fatigue of our external organs; or the power of internal images, either terror-inducing or pleasurable, which are activated, we do not quite know why, in ourselves when we perceive the qualities of a certain external body, may cause our perception of them to be more, or less, intense than the usual ones of that same body. Or that we fool ourselves about the inherence of heterogeneous perceptions in one or in several bodies, e.g. if someone laces the fingers of their hands together and we feel the result, without looking at it, we will feel that it is one body and not two (Aristotle's example). Or, in short, that we simply suffer acoustic or visual hallucinations in certain circumstances. Well then, Aristotle observes that internal common sense, precisely for being common to the five external senses, is the one that can most assuredly settle these conflicts or errors. Given that sight is the most developed sense in animals of the human species (more than touch, which is the next one), it can discriminate whether the interlocked fingers we are touching belong to one body or to two or to multiple bodies. And if our sight is not sure whether certain qualities belong to one same body (e.g. the colour of a straight pole submerged in water, and the break that seems to appear in the submerged part), it may resort to touch so that common sense settles which heterogeneous sensations occur in which body, and which perceptible appearance of the body is dominant over which other one.

No other capacity for discrimination through comparison between different images done by common sense was actually the one used by the botanical illustrator François Turpin to establish, from among the daguerreotypes obtained by the French inventor, which ones were true images of the natural bodies situated in front of the camera and which ones weren't. In his chronicle on Daguerre's invention, on 6 January 1839, the journalist H. Gaucheraud expressed his astonishment at the detail of a spider's anatomy, reproduced in one of the calotypes he had been presented with[18]. But in his "Physique Appliquée. Sur l'application du Daguerréotype relativement à la représentation des objets d'histoire naturelle" (1840), the botanist and member of the *Académie* had another point of view on some of the images presented by Daguerre.

> It is the daguerreotype that [compared to painting] has the possibility to obtain *absolute* perfection in the representation of bodies provided that, given its various colours and its *indispensable immobility*, light can reach the image and fix it. [...] However, these images, however admirable they may be in their *absolute* precision in the smallest details, in the relative size of the parts, in the linear and aerial perspectives, in the shadows, in the half tones and in the lights, rigorously reproduced in their real places; these images still leave much to be desired in certain aspects. [...] Thus, efforts have been made to reproduce on a large scale tiny organic bodies, combining the action of the microscope and of the daguerreotype. But in this case we were unfortunate, for the images shown to us of these bodies truly lacked any value from the morphological viewpoint and, above all, from the didactic viewpoint. Of these images, the least bad is one by M. Daguerre showing the spinnerets and abdomen of a spider. They then showed us a flea in profile whose entire silhouette, certainly a very exact one, offered nothing but a single, uniform, very dark tone. On Monday it was the turn of the human scabies *Acarus*; same size, same silhouette with a few very dark details inside it, because the insect is far

18. "A dead spider, taken through the solar microscope, has such fine detail in the drawing that you could study its anatomy with or without a magnifying glass, as in nature; not a filament, not a duct, as tenuous as might be, that you cannot follow and examine"; Gaucheraud, 1839 [1980: 18].

> less colourful than the flea, but again with a regrettable imprecision in regard to the numerous and very notable external and internal organs displayed by this arachnid, most of them totally absent in the image. [...] All of this, as well as many other things too long to list in this brief note, demonstrated the deficiencies and uselessness of this test image that, at most and in the best of cases, presented the shadow of the human scabies *Acarus*.
>
> Far be it from us to criticise the work of observation, formulation and experimentation through trial and error or the *a priori* method, for it is only through these two methods that discoveries are made. However, we thought it would be highly beneficial for science, and for researchers, to provide the *Académie* with nothing more than facts that are truly new and somehow useful, something that is easy to verify by first consulting men who are competent in each branch of knowledge. The consulted naturalist would have said: his spider abdomen, his flea, his *Acarus*, serve no purpose, because you obtain nothing but the shadow or silhouette of the thing and because, in natural history, all details should appear rigorously represented and differentiated.

The text is of interest because it manifests that, despite the daguerreotype being the child in its own right of the natural science of its time, its usefulness for works of illustration and teaching of these same sciences was still far from being resolved. More than 6,000 plates of flowers, trees and animals are attributed to Turpin, painted in watercolours to illustrate the taxonomies of French botanical and zoological science manuals in the early decades of the 19th century. But the images amassed in his memory on the bodies of these plants and flowers, and on the spiders, fleas and the human scabies *Acarus*, allowed him to discredit the images of those very animals presented by Monsieur Daguerre on his iodised plates.

The fate of the calotype was not much different. In January 1839, Talbot expounded before the members of the Royal Society on the possibility of applying calotypes to fixing the images developed by the solar microscope[19]. Unsurprisingly he then sought the collaboration of certain scientists to implement this application of his method. But the results he offered were not sufficiently developed for the cooperation to be put into effect. In March 1839 Talbot sent several calotypes of plant specimens to William Hooker, at the time an English botanist of the highest distinction. Talbot suggested they work on the creation of a book on native plants, illustrated with calotypes. Hooker observed those images. He did not need actual perceptions of the specimens represented in the calotypes, nor illustrated engravings of them: the images in his memory sufficed for him to compare them with those that Talbot was presenting and to judge them.

> Hooker rejected the idea, saying that "Your beautiful *Campanula hederacea* was very pretty as to general effect —but it did not express the swelling of the flower, nor the calyx, nor the veins of the leaves distinctly."[20]

There is no intellectual grasp or judgment that does not occur in and through an image

This manner of reacting of the Frenchman Turpin and the Briton Hooker, together with the examples suggested above, bring to light that, in human beings, external perception, imagination and memory can be aligned in the cognisant individual so that he emits a *judgment* on what he is perceiving, imagining and remembering simultaneously. Voltaire also pointed it out in the aforementioned contribution of *l'Encyclopédie*: although sensation, imagination, memory and *judgment* appear to occur through different organs, in reality they occur in one same individual, who is alerted to these operations because he is capable of consciously experiencing their respective effects.

Aristotle was the first to recognise that the discrimination of divergent qualities which common sense is capable of observing between different images (or parts of images) occurs in us in conjunction with intellectual judgment[21]. Discriminating whether qualities that are divergent or contrary to the usual ones occur or not in one same body (e.g. the splash of colour and the non-straightness of the pole semi-submerged in water); or whether the qualities that occur notably less intensely than how experts experience them in the observation of a certain class of bodies (those of the spider in Daguerre's image, and those of the same spider in Turpin's imagination), undoubtedly entail a judgment. Which means affirming or negating, with a claim to it being true, that something occurs in something, or that something does not occur in that something. Affirming, for example, or negating that the spider's body is like the one provided by Daguerre's

19. Talbot, 1839 [1980: 26-27].

20. Tucker, 2005: 22.

21. Cfr. *Peri enypníōn,* 460 b 18-22, 461 b 1-3. *Problēmata*, Z, 886 b 35-887 a 1. *Tōn metà tà physicá*, Γ, 1011 a 33-34.

image; or affirming or negating that the deeper sound of the distant ambulance siren is the same as the higher-pitched sound produced by the same siren as it approaches us. We make the ultimate decision on what occurs where, in these and in other cases, on the basis of what we perceive and feel through the external and internal senses, and convey it in terms of knowledge through an affirmative or contradicting judgment.

This is the activity which Aristotle called intellectual grasp or *apprehension* (*hypólēpsis*). It is the one which the child exerts in his initial dealings with the external world, when he sets his sights on something and points it out while saying: "dog", "house", "girl". Intellectual apprehensions, as stated by Aristotle, occur according to multiple degrees of firmness. The first ones we acquire not just as children but also in the first years of Zoology studies, for example, are initially vague or unsure notions, although sufficient to propose these apprehensions according to our judgments about them instead of about any others. The perceptive experience, the fixing of singular images in our memory, and the addition of details associated with each class of bodies will allow our initial apprehensions to gradually acquire intellectual determination and confidence. In a vague and imprecise way we will thus apprehend that the *Acarus* specimen presented by Daguerre on his iodised plate corresponds to the human scabies mite; but in a totally sure and certain way we will apprehend that it is the one represented in Turpin's watercolour, where one can distinguish "the animal's eight legs, so different between each other and with such unique characteristics; the mouth, the oesophagus, the vast stomach, the ovary, the ovoid and reticulated egg in the females, the stylus-shaped upper lip and the spade-shaped bottom or sternal lip, the maxillary palps and the two tiny crystalline eyes that are so difficult to see; the great lung pouches located on either side of the body's front part; the numerous and prominent transversal crests that give solidity to the insect's carapace or horny layer in its top and bottom parts; the numerous protuberances arranged symmetrically on the back and shoulders, each one of them ending in a shorter or longer, downward-pointing tip or spine; and finally the various *colours* that help to distinguish this insect's organs". The intellectual grasp obtainable from the daguerreotype will barely serve to affirm that the specimen fixed by the image is that of the human scabies mite, but Turpin's watercolour will allow us, or almost *force* us, to categorically assert it.

The Aristotelian interpretation of human knowledge has the advantage of linking up the external sensitive perception and the internal imaginative and memory-related one with intellection, in a *continuum* of heterogeneous levels of knowledge which, however, are articulated with each other and lead to useful judgments for expressing surer and more convincing intellectual apprehensions, those of the sciences. External perception is articulated with internal perception through the imagination; the imagination is articulated with the earliest intellectual notions through memory; then, repeated observation and learning lead to the categorical judgments pursued by the empirical sciences. The *continuum* of cognitive levels also ensures that the subject of the knowledge is the same at each one of these levels, given that the cognitive ego has not disappeared in any of these stages.

It is true that the philosopher has to consider whether the imagination and memory possessed by certain species capable of practical learning (elephants) but not capable of abstract thinking (e.g. mathematics) are of the same genus as those of human beings. And the answer is no. Human beings have a capacity for imagination similar to that of the rest of higher animals, entirely sensitive and not sharing anything, or hardly anything, with abstract intellectual capacity. The images of this internal capacity can be activated in us during sleep, or in states of fever, illness or inebriation, for example, that is to say: in a state in which our reason is deactivated. But in human beings there has to be another imaginative power that, while remaining sensitive and suitable for the production of perceptible images disassociated from a current external perception, shares the rational principles of the human soul. Aristotle situates it on the limit between internal sensitive capacity and intellective capacity. It is one and the same image, but inasmuch as internal perception limit is defined in one way and inasmuch as the principle of intellectual grasp is defined in another. Kant (1798, §, 31, C) offers another solution to this problem, which is the association by affinity of heterogeneous images. But this is not the place to compare it with the Aristotelian model.

Noematic power of the image

We thus arrive at the end point of what the perception of a daguerreotype or, in general, of a photographic image, implies according to the Aristotelian model. The philosopher holds that, in our species, there is no act of intellection that does not occur simultaneously with and in an image. If we think of the notion of *dog*, we do so imagining a type of animal with sufficient perceptible qualities to be effortlessly distinguished from that other image and grasp which we associate with the name of *giraffe*. We are not imagining either a particular dog or a giraffe, an individual one, but an image-type of specimens from those species. If we intellectually apprehend the notion of the human scabies mite, we associate it with an image-type of the individuals of that species, with perceptible qualities that differ to a sufficient degree to distinguish it from the image we associate with the notion of flea when we say *flea*. The same with the notion of dot or triangle. Even if we have never perceived a dot or a triangle that exactly corresponds with the mathematical notion of dot, or of triangle, we cannot speak with any sense of dots, lines and triangles without simultaneously associating to those intellectual notions the image of a dot (with extension and colour, as if it were a surface), or the image of a triangle (similar to the ones we have seen sketched on a blackboard or a piece of paper). Finally, if we say *substance*, like chemists do, or if we say *God*, like metaphysicians do, we cannot disassociate a certain image from the intellectual notion that allows us to think of one and another of these realities in a more or less defined manner.

What is most surprising about these intellective acts is that the sound of the words we use to name them is different in each language: *dog, perro, Hund*. Furthermore, that assigning meanings to these different sounds is a convention adopted by each community of speakers of a language and may even be different for the same sounds. In Spanish, for example, the word *coger* has one meaning in Spain and a different meaning in Argentina. Even more surprising is that we are not sure that the image which each user of a same language associates with a certain word through his experience is the same in each and every one of the speakers. We cannot be sure that exactly the same image is available to a Briton when he says *dog*, the one available to a Spaniard when he says *perro*, and the one available to a German when he says *Hund*. Not even that two Spanish speakers have the same internal image available to them when they mention and think of a dog. And yet, Aristotle observed, the noema, namely that which is understood by each one of those who use each one of those terms, in any language, is *the same*. We all understand *the same thing* when one says *perro*, another says *Hund* and a third says *dog*. All the chemists in the world understand the same thing when they say *silver nitrate* or *sodium thiosulfate*, whether they say it in Spanish, in Latin or in Dutch. With the immense advantage, says Aristotle in *On Interpretation*, that thanks to the noema we can take those remote realities, so distant from us but which we wish to deal with in our discourse, and make them *present* before those we are speaking to, thus enabling us to discuss them as if they were where we are.

We can now ask ourselves three fundamental questions about the way the photographic image, born in 1839, fits into our manner of knowledge, hitherto understood as being in keeping with the Aristotelian model. On one hand, how much of that knowledge model is to be found in the intellectual perception, imagination and grasp of a daguerreotype, of a calotype and, in general, of any photographic image? On the other, how much of that knowledge model, which is valid for obtaining scientific knowledge, is *not to be found* in the intellectual perception, imagination and grasp of photographic images? Finally, how much of that model has any usefulness for the practice of photographic art?

Natural photographic capture and perception of one part of the whole of) physical bodies

As regards the perception of the photographic image (daguerreotype, calotype, or on any other support), it is obvious that this activity is not acoustic, nor olfactive, nor gustative nor tactile but visual. The sensory experience of the external perception of the photographic image leaves out many other aspects of the same reality, once situated in front of the camera lens, that we could perceive through any of the other external organs of perception: how it sounds, how it smells, the qualities it offers to the touch... Many of these qualities occur simultaneously in our habitual experience of that reality, when we walk on the street or enjoy a landscape. It also occurs in our activity as spectators when, for example, we watch a film or an opera. A vision of lights and shadows, colours, movements and pauses, vocal and instrumental sounds, theatrical gesticulation, etc. are some of the heterogeneous perceptions we apprehend simultaneously as spectators of an operatic spectacle. But photography is limited to the first one, to vision. We cannot say that it is a comprehensive perception of any of the physical bodies that are within reach of our senses. And even so, the fact that we can see a photograph is no mean feat given that this faculty is the most highly developed in our species and allows us to discriminate countless differences in light, shadow and colour. Literature, for example, has no perceptible image similar to photography. Reading only activates in us (no mean feat either) the imagination and the emotions associated with it and the intellection through the internal images reading awakens in us.

But the daguerreotype[22], the calotype[23] and any photographic image internally differentiated by its half tones

22. R. Gaucheraud observed in his report for the *Gazette de France*, on 6 January 1839 [1980: 18]: "If I wanted to find something resembling the effects rendered by the new process, I would say that they take after copperplate engravings or mezzotints – much more the latter".

23. Talbot, 1839 [1980: 26]. He recognises that there are only indications of colour; and in that first hour he is as interested in producing calotypes in colour as he is unsure of the possibility of achieving it in a short time.

leaves out what, according to Aristotle and our experience, is the perceptible quality inherent and exclusive to sight: colour. Neither hearing nor smell nor taste nor touch can discriminate the colours of bodily surfaces like sight does over a wide spectrum between violet and red light (up to 10 million colour differences are estimated). But all those colours have been left out of photography, which was monochrome for physico-chemical reasons from its birth[24] until the early 20th century.

The divestment of colour in nascent photography confirmed this observation, expressed by Herschel in 1840 before the Royal Academy: "The chemical action of the different rays of the solar spectrum appears to a large extent to be foreign to the chromatic impressions received by the eye". And one of the first promoters of the daguerreotype in the United States, the chemist and NYU professor John William Draper (1840), wrote:

> "The retina receives an impression with equal facility from each of the different rays, the yellow light acting as quickly upon it as the red or the blue. Vision is therefore performed independently of time, the eye catching all the colours of the spectrum with equal facility and with equal speed. But it is not so with these photogenic preparations. In the action of light upon them, time enters as an element; the blue ray may have effected its full change, whilst the red is yet only beginning slowly to act; and the red may have completed its change before the yellow has made any sensible impression".

This observation of Draper's underlines the difference between the chemical action of the solar rays on photosensitive substances, and the physico-biological action that updates our vision. In regard to the latter, Aristotle had already observed that sight (also hearing, or intellectual grasp, or being happy) start and end in a time imperceptible for us. One sees and at the same time has seen; one hears, and at the same time has heard; one apprehends that, for example, the whole is greater than the parts, and has simultaneously apprehended it. One lives and at the same time has lived, is happy and has been happy. These cognitive, life and also moral actions (although this is not the topic of this essay) Aristotle denominates *praxis*. And he distinguishes them from the *poiesis*, or *productions*: one does not start slimming down and at the same time has already slimmed down, nor does one start travelling and has simultaneously travelled, nor starts building a ship and simultaneously has built it. Productions extend over time from when they start until they reach their end; and in their extension between both moments, the continuous movements (of transferring, of quantitative build-ups or of qualitative changes) occur gradually. Each one of the intermediate stages is more complete than the initial stage and all the ones previous to it, when the process was at its start; but none of them is more complete than the stages that will follow it and the final stage, when the change has been fully completed and actually ceases to exist as change, because no further such change can occur; one does not continue to travel once the travel destination has been reached.

We have here a key question in which the experience of the producer of photographic images and the experience of their viewer (*the spectator*[25], according to Talbot), are separated in regard to the way they experience the *time* in which the photograph exists.

What the viewer of a photograph does not perceive

Contemplating a photographic image is a full-blown praxis: one sees it, has seen it and continues to see it. The perception of each photograph is as perfect as the one we have of a flower, a building, a landscape, an individual or an oil painting.

The experience is given to us full and complete, it is perfect and finished from the very moment it occurs. Furthermore, it can be extended for as long as the viewer wishes without losing any of its perfection in terms of visual activity. One can pay more attention to some of the image's parts that perhaps went initially unnoticed. But again, the perception of that part of the image, to which we are paying greater attention, is perfect from the very moment it occurs. And if we then continue to focus on another of its spots, it is not because the image has suddenly disappeared from our visual experience but because we have decided to continue our perceptive activity by paying greater attention to another of its parts. The fact that the photograph is monochrome, like daguerreotypes and calotypes, does not intervene in this; the vision occurs not only before the differences in colour on the bodies' surfaces but also before its differences and degrees of light and shadow.

The experience of the producer of photographic images is very different. In his aforementioned 1840 paper, the botanist

24. Cf. for example, R. Gaucheraud's comment in the *Gazette de France* of 6 January 1839 [1980: 18] on colour: "Trees are rendered very well; but their colour, it seems, creates an obstacle in that the sun's rays reproduce them as quickly as the houses and other objects of different colour. That makes landscapes difficult to take, because there is one perfect, fixed degree for trees and the colour green, another for all the colours which are not green. Indeed, the result is that when the houses are 'done', the trees are not, and when the trees are, the houses are 'overdone'".

25. The Pencil of Nature, comment to Plate II, View of the Boulevard in Paris. Plate XV, Lacock Abbey in Wiltshire.

and illustrator Turpin laid out how "black bodies such as curtains, hats, suits, ties, while offering effects of shadow and light to our eyes, do not in Daguerre's pictures present more than contours, highly faithful to reality but as if filled with a greatly uniform layer of black. The work of the half tones is admirable, but lacking in intense light or glow, the image lacks animation". So the producer of photographic images has to calculate beforehand which blacks or which shadows, from among those presenting themselves on the surfaces of what he is setting out to photograph, will result, in the monochromatic image, in black spots without half tones and therefore imprecise and dead, so to say, in order to exclude them from his image, or to illuminate the bodies beforehand, if possible, in a suitable manner.

But the difficulty did not occur only with the blacks but also with the different colours and the time required by each one to give rise to the photogenesis of the photographic print. This was observed by Talbot in his comments to plates 3 (china pieces) and 4 (glass pieces), reproduced in his *The Pencil of Nature*:

> It may be remarked that white china and glass do not succeed well when represented together, because the picture of the china, from its superior brightness, is completed before that of the glass is well begun. But coloured china may be introduced along with glass in the same picture, provided the colour is not a pure blue: since blue objects affect the sensitive paper almost as rapidly as white ones do. On the contrary, green rays act very feebly —an inconvenient circumstance, whenever green trees are to be represented in the same picture with buildings of a light hue, or with any other light coloured objects.

Something similar occurred in obtaining daguerreotypes. The New York chemist John W. Draper, cited above, knew by experience that the blue ray may have completed its action when the red ray had barely begun to do so; and how it was possible that, by the time the red ray had finished affecting the photosensitive substance, the yellow ray had not yet made any visible imprint on the paper.

In both cases the time factor appeared to be a key element in the action of the rays of differing frequency on the photogenic preparations. Exposure time had to be calculated beforehand by the photographer so as not to remove the plate or the paper before the reaction process of each inch of the photosensitive support being used had been completed. Photographic production was not a praxis that occurs in its complete entirety right from the start but rather a *poiesis*, which can last several minutes from the start until culminating in the sought-after emulsion.

But then the problem emerges of the body's movement before the camera. It is indispensable for the image's producer to ensure beforehand that the body about to be photographed is completely still for the entire time of the aperture to the light of the photosensitive substance. If it is a tree, for example, the movement of its branches will spoil the image's precision, for it would be blurred. If it is an individual, if he keeps his hands on his breast, they will be printed in an equally blurred manner on the image, the result of the rising and falling of the breast's breathing cycle. To prevent these and other similar problems, Draper suggested adding different chemical reagents to the photosensitive emulsion, each one valid for different colours. And in the case of portraits, the models could not cross their hands on their breast, and a seat with a discreet headrest had to be used so that the subjects would remain in repose throughout their time before the camera. And he concluded: "Miniatures procured in the manner here laid down, are in most cases striking *likenesses*, though not in all. They give of course all the individual peculiarities, a mole, a freckle, a wart. Owing to the circumstance, that yellow and yellowish browns are long before they impress the substance of the Daguerreotype, persons whose faces are freckled all over give rise to the most ludicrous results: a white, mottled with just as many black dots as the sitter had yellow ones".

We already mentioned earlier how Talbot had discovered the opposition between sharpness of image and time of exposure to the light. Now we have to add to this the opposition between movement and precision of the photographic image, for the less there is of the former, the more there will be of the latter. This is how Talbot accounted for his experience, in his comment to plate XIV (The Ladder):

> If we proceed to the City, and attempt to take a picture of the moving multitude, we fail, for in a small fraction of a second they change their positions so much, as to destroy the distinctness of the representation. But when a group of persons has been artistically arranged, and trained by a little practice to maintain an absolute immobility for a few seconds of time, very delightful pictures are easily obtained.

The inventors of photography and its earliest investigators and explorers[26] all recognise that the photographic image has to

26. Cf. for example, R. Gaucheraud comment in the *Gazette de France* in 06.011839 [1980: 17) on this impossibility: "Nature in motion cannot reproduce herself, or at least can do so only with great difficulty, by the technique in question. In one of the boulevard views of which I have spoken it happened that all which moved or walked did not appear in the drawing; two coach horses were standing by the curb, one unfortunately moved his head during the short operation, the animal is headless in the drawing".

dispense with the movement present everywhere in the physical world. *Stillness* is the indispensable condition of the photographic image, at least if we are looking for it to be exact. This again points out an unequivocal difference between the camera and human sight, for we see bodies in repose or in movement with equal facility. What is more, it is through the same organs and the same system of perception that we exactly distinguish when a body is at rest and when in movement, or when it is in one state and starts to be in another state (at least within the threshold of our visual perception).

Right from its birth it was clear that photographic production is associated with movement, and with its duration in time, in two ways. On one hand, it requires a certain amount of exposure time, greater or lesser depending on the amount of active light in the medium of vision, and its reflection on the photographed surfaces, and the aperture of the diaphragm, and the photosensitivity of the emulsifiable substance. There is, strictly speaking, no instantaneous production of a photograph; they all require more or less exposure time. All photography *occurs* in time and *contains it*. Generating it requires changes that occur in time, and that time, in which the photosensitive substance changes, is fixed in time. It is not only light that reaches the camera lens, nor the limited space in front of it that is fixed and halted for ever in the negative: time is too. And this despite the fact that human perception of any photographic image is instantaneous, that its viewer will not require exposure time to the image to see it entirely and perfectly, with its light, space and time, all fixed and whole in the image.

But at the same time photography has to ensure as much stillness as possible in the photographed body. The state opposite to stillness, or movement, is, according to the Aristotelian knowledge model, a perceptible one common to virtually all senses: sight, hearing (sounds approach and move away from us, indicating the movement of the body that produces the sound), smell, taste (we perceive that the living oyster we ingest moves in our mouth), and undoubtedly touch. But it so happens that the exactness of the photographic image is contrary to the capture of movement. The more immobile the photographed body stays, the more exact the image obtained after exposure time will be. If there were an absolutely immobile body under the light, if that light did not move or change, we could photograph a body for an unlimited time, and the results would probably be of an exactness unattainable for the human eye. But because such assumptions are hypothetical, the producers of daguerreotypes and calotypes had to settle for the headrest recommended by Draper for commercial studios. Or forego photographing masses of citizens in movement, as Talbot had done, and settle for portraying small groups —no more than five or six individuals— who would pose motionless in front of the camera. One might perhaps find certain exceptional circumstances in a great natural setting —e.g. a forest— that would stay perfectly still in front of the camera. This was the enthusiastic wish of George Butler, a young student friend of Talbot's, mentioned to him in a letter written in March 1841:

> What I should like to see, would be a set of photogenic Calotype drawings of Forest Trees, the Oak, Elm, Beech, &c. taken, of course, on a *perfectly calm* day when there should not be one breath of wind to disturb and smear-over the outlines of the foliage. This would be the greatest stride towards effective drawing & painting that has been made for a Century. [...] What a beautiful Set of *Studies* of Trees, Shrubs, &c. might thus be prepared in a very short time! And what an extensive Sale must it obtain! Laporte, Burgess [British painters and watercolourists], &c. w^{d} be nothing to it, either in popularity or effect.

What a scientist does and does not perceive in a photograph

A more realistic opinion than Butler's was that of the scientists who illustrated the Botany and Zoology treatises contemporaneous with Talbot and Daguerre, such as the aforementioned Turpin. The absence of any benefit from the daguerreotypes obtained from insects —spider, flea, human scabies mite— for illustrating the biological sciences treatises were otherwise similar to that of the talbotypes, which he was also acquainted with. "The photogenic drawings received on sensitive paper offer nothing in the way of the precision required by natural history objects: there is always a softness and an imprecision in the details that prevent it". And he concluded: "If ever Daguerre's procedure succeeded in showing all the details of the human scabies *Acarus* as observed in the coloured drawings, it would offer huge advantages, for what costs us more than a fortnight of study and work and requires the knowledge of the naturalist and the skill of the painter, *anyone* could obtain in a few instants and would be, as a *monochrome* drawing, *infinitely* more perfect. But we are still a long way short of that. We will have to wait. And as for *colour*, so far we have achieved nothing, for the more or less slaty, reddish or greenish tone that the drawings arbitrarily present is not colour".

Here then we have a precise indication of the obstacles that separated newly born photography from scientific botanical and zoological illustration. Since, in any science, accuracy is an inalienable methodological requirement, the lack of it in the images of Daguerre and Talbot, as they had developed in their first two years of existence, made them scientifically unusable.

Yet here we have something absolutely interesting: that this very lack of accuracy in the photographic images in regard to colour reproduction, greyscales and difficulties with moving bodies, was perceived right from the start as a great artistic possibility. Those whom Talbot's student friend, George Butler, wanted to see dethroned from their craft by the calotype were not the botany illustrators but the contemporary watercolourists and landscape artists. And Turpin, so critical with the possibilities of scientific photographic illustration, made this astonishing assertion:

> Among the numerous drawings submitted to the *Académie* by M. Biot on behalf of M. Talbot, we have one that is a representation of a real-life elm denuded of its leaves in winter. The image is poorly defined in the profiles of its contours; and the tree's last tiny branches present themselves in a veritable state of confusion caused by the air that shook them at the moment when it was received in the camera obscura, and are offered only as a flat and brown tint in the thicket of the branches. And yet this image, *just as it is*, has a character of authenticity, a singular appearance, that no painter of landscapes has ever before reproduced and will never be able to reproduce, no matter how much care and effort he puts into the execution of his drawing.

What is it about this imperfect, inexact image of a wintery elm that will always be lacking in that same elm painted by a skilful watercolourist? Its authenticity, replies Turpin, that singularity in its appearance that makes itself felt even through an image that is completely unsuitable for a scientific view. Deprived of movement, monochrome, useless as a representation of a specimen of this plant species, the photographic image of that wintery elm seems more real than any painting made by a proficient artist. It all has an "*air of reality*" (Talbot, 1844[27]) that, while not exactly "*the reality*", lives in it and produces those *charms of photography*, of which Talbot also spoke[28]. The artistic power of the new discovery was making much faster headway than its power as a scientific tool. And one of the obvious reasons for this advantage is that, if for scientific works the imagination has to be completely subject to the judgment of those who do science, in art it is exactly the opposite: the imagination can complete an imperfect photographic image and be the spark that sets of an aesthetic blaze in the viewer's psyche.

Taxonomy of the calotypes published in *The Pencil of Nature*

The first photography book in history, *The Pencil of Nature*, includes twenty-four photographic reproductions. Talbot denominated them "Plates" (*plates* are also the engravings that illustrate botanical or zoological treatises). Each one of these illustrations was developed from as many calotypes made by Talbot. Each copy was pasted manually, one by one, into each copy of the book. Talbot added a footnote discourse or comment to each one of them. To facilitate our analysis we will arrange these twenty-four plates, like the taxonomists, according to the following thematic contents.

The first family of calotypes offers different specimens of monumental architectures. Several of the photographed buildings were widely known by most cultured Britons, e.g. the Queen's College (plates 1 and 13 [Shaaf, nos. 1462 and 1574), Christchurch College (plate 18 [Schaaf no. 913]), and the Martyrs' Memorial (plate 21 [Schaaf no. 1923), all of them in Oxford. Equally well-known by the English, surely more than the Oxonian colleges, are Westminster Abbey (plate 22 [Schaaf no. 2114]), of which Talbot offered a frontal view. Added to these were three views of Lacock Abbey (plates 15, 16 and 19 [Schaaf nos. 74, 312, 1660]), a construction as ancient as those in Oxford and London, in the county from which Talbot hailed (Wiltshire) and was his habitual residence. These latter monuments would have been known by the photographer's neighbours and fellow county dwellers, but plausibly by few other Britons. Even less known to most Englishmen would have been the view of a Parisian boulevard (plate 2 [Schaaf no. 115]), and the bridge leading into the city of Orléans (plate 12 [Schaaf no. 2736]), which completed the family of monument photography in *The Pencil of Nature*.

The second family of photographic themes chosen by Talbot for his book includes what we could call "common spaces or places": the façade of a barn (plate 14 [Schaaf no. 3456]); a haystack (plate 10 [Schaaf no. 2770]); the entrance to a private house, with a half-open door (plate 6 [Schaaf no. 2772]). Unlike the monumental buildings of the previous section, these are ordinary places. None of them has likely survived from a remote past, like the earlier ones; they are content with living modestly in the present. Nor do they have a proper name, like those others, but a common one. It is just

27. Talbot, 1844, comment to plate IV, The Ladder.

28. Talbot, 1844, comment to plate XIII. Queen's College, Oxford.

any old haystack, any old ladder, any old house. None of them had to have studied at a university college in order to be recognised, nor have travelled beyond one's own county, or abroad. The viewer will immediately know, or rather recognise, these places not because he has been there but because they are entirely similar to those he passes through or lives in every day. His imagination stores images of common places similar to those in these calotypes, so there is no mistaking what they are and how to name them.

If from the buildings, monumental or common, we move to other inanimate bodies with a smaller volume, we can group them together into the family of products within fine arts and applied arts; and into another, different family, that of everyday objects.

The bust of Patroclus is reproduced by Talbot on two plates (5 and 17 [Schaaf nos. 3706 and 1468]). The facsimile reproduction of a beautiful manuscript page at a 1:1 scale is offered as plate 9 in the book [Schaaf no. 4209]. Talbot also reproduces (plate 11 [Schaaf no. 5574]) a lithograph made by a French caricaturist, but this time not at a 1:1 scale. He also reproduces a pencil drawing as a calotype representing a biblical scene, "Hagar in the desert" (plate 23 [Schaaf no. 3421]). The author of this drawing is Francesco Mola, according to the text accompanying it in *The Pencil of Nature*. This possibility of reproducing drawings as calotypes was well tested by the photographer, referring to it in a presentation as far back as January 1839 before the Royal Society[29]. Finally, *The Pencil of Nature* also offers a close-up image of a piece of lace (plate 20 [Schaaf no. 1075]). Talbot had already photographed similar motifs[30] at an earlier date, of which he told in his paper before the Royal Academy in January 1939[31]. Most of these products (sculptures, lithographs, drawings, lace) could be attributed to a specific artist from an also specific period; however, they are not included in *The Pencil of Nature* as singular objects by an identified author but *as specimens*[32] of artistic genres reproducible as calotypes.

We could also consider plate 3 (ceramic china items [Schaaf no. 66]) and 4 (glass items [Schaaf no. 69]) as part of this family given that they show items of a certain value typically found at an antiques dealer, for example. These items were placed by Talbot on the shelves of a display cabinet according to a studied alternation of sizes and shapes and look as if we might find them in a collector's home. In addition, in this arrangement on shelves of the photographed bodies, these calotypes resemble *Bookshelf* (plate 8 [Schaaf no. 18]) in which old, beautifully bound volumes look like they would in a library, with the spines outwards (though not all of them). This plate belongs to our fourth thematic family, that of photographs of ordinary items (although in this case not entirely common but rather those of an amateur in the decorative arts and a bibliophile). Also belonging to it is undoubtedly the fruit baskets filled with pieces in plate 24 [Schaaf no. 16], the last one of *The Pencil of Nature*.

There is an image that cannot be classified into any of the preceding families, a plant leaf (plate 7 [Schaaf no. 1168]). In the explanation that accompanies it, Talbot does not establish to which order or genus or species this specimen belongs, as a botanical illustrator would have done if seeking to obtain an illustrative icon of a species. The insertion of this calotype in *The Pencil of Nature* allows its author to explain the procedure followed in obtaining it: direct contact of this plant body with the photosensitive paper, uniformly pressed down by a superimposed glass pane. In his January 1839 paper he had already referred to this method apropos the heliographic generation of calotypes of plants or grasses. Because he had obtained them through direct contact with the paper under uniform pressure of the glass, Talbot then called them *engravings*[33]. Talbot had practiced this procedure to obtain calotypes of plant specimens since at least 1836[34]. And in that same 1839 paper he referred to this practice as being the first of the applications he had obtained with his heliographic method[35].

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29. Talbot, 1839 [1980: 26].

30. Precedents of this calotype image are, for example, "An Image of Lace, Presented for an Exhibition" (1839, Schaaf 1501), "Band of Lace" (1839, Schaaf 1063).

31. "To give an idea of the degree of accuracy with which some objects can be imitated by this process, I need only to mention one instance. Upon one occasion, having made an image of a piece of lace of an elaborate pattern, I showed it to some persons at the distance of a few feet, with the inquiry, whether it was a good representation? when the reply was, 'That they were not to be so easily deceived, for that it was evidently no picture, but the piece of lace itself". Talbot, 1839 [1980: 24].

32. Also Talbot, 1839 [1980: 25].

33. Talbot, 1839 [1980: 28, 30].

34. Thus, "The Ghost of a Plant" (1836, Schaaf 112), "Astrantia major – The "Melancholy Gentleman" (1838, Schaaf 2244), "Erica mutabilis – a Present to Sir John Herschel" (March 1839, Schaaf 2291), "Leaves of Orchidea" (April 1839, Schaaf 2298), "Bryonia dioca" (1839, Schaaf 2097), "A Cascade of Spruce Needles" (1839, Schaaf 1653), "Wild Fennel" (ca. 1841/42, Schaaf 757), etc.

35. "The first kind of objects which I attempted to copy by this process were flowers and leaves, either fresh or selected from my herbarium. These it renders with the utmost truth and Fidelity, exhibiting even the venation of the leaves, the minute hairs that clothe the plant, &c. &c.". Talbot, 1839 [1980: 24].

The one of the anonymous plant leaf is not the only calotype in *The Pencil of Nature* obtained through the direct contact procedure. The facsimile of the manuscript (plate 9 [Schaaf no. 4209]) and the drawing of Hagar (plate 23 [Schaaf no. 3421]) were also obtained "by the method of superposition"[36], as annotated by Talbot in the texts that follow these calotypes.

It is striking that Talbot does not offer a photographic portrait, neither individual nor of a group, in *The Pencil of Nature*. In his January 1839 paper before the Royal Society he had referred to the usefulness of the calotype in producing *silhouettes* or, as he clarified, portraits of contours[37]. But portraits, *tout court*, he had not yet managed to produce successfully. The three human figures appearing next to the barn with ladder in plate 14 of *The Pencil of Nature* cannot be considered to be portraits. Rather, they are parts of a stage set, so much so that two of them even appear with their backs turned to the camera.

Now I am interested here in analysing how the imagination of the reader of *The Pencil of Nature* can operate in his role as viewer of each one of these images. I'll dispense for the time being with what Talbot's discourse adds or does not add to the reproduction of each one of his calotypes. I want to focus on the act of interior sensitivity involving imagination and memory that is simultaneous to the act of perception of each one of these calotypes by the book's explorers / viewers; and on the judgment that credibly accompanies the corresponding intellectual apprehensions that also occur simultaneously with the external and internal perception of the calotypes.

Viewing of calotypes of geographies or architectures we already know

First assumption: the specific and concrete place offered by the calotype is known to the viewer prior to perceiving its photographic image. That would be the case of Oxford University graduates when they see the views taken by Talbot of the city where they studied. Or the denizens of the county of Wiltshire, who know Lacock Abbey as well as Talbot does. It is likely that the act of imagination that accompanies the perception of these photographs will involve memory in all the cases. The photographic image activates the image or images which the viewer already has of these same places thanks to the experience of having lived there or having travelled through them. And given that the memories so stored by and in his imagination will come to the present of his interior common sense, he will be able to *recognise* the places presented to him by the calotypes and name them by their actual names. Talbot's photographic image and the memory image of its viewers will allow each one of them to tell himself: "Yes, this is the entrance to Queen's College", or "Yes, this is the cloister of Lacock Abbey". Both images, an external one (the calotype) and the other internal one (his imagination) allow him to make an affirmative judgment on the truth of the representation, indicated by its actual name.

However, if we refine the observation a little further, we will say that when the viewer asserts that "this" is the gate to Queen's College, or "this" is Lacock Abbey, he does not mean to say that "this photograph pasted into this copy of *The Pencil of Nature* is such and such a College or such and such an Abbey". The viewer does not mix up the reality of these monuments with the reality of the support with its corresponding images pasted into a book. Rather, what he means is that "this" to which the photograph is imaginatively leading me is certainly that College or that Abbey mentioned in the text.

We have already observed how different significant sounds (*Hund*, *perro*, dog) generate the same noema in the person pronouncing them, and how that unique noema is the one that brings one and the same reality to the presence of those who speak and listen. Well then, we now discover that the perception, imagination and judgment which the photographic image enables, in the unique and simultaneous act in which these three cognitive levels occur in the viewer, fulfils the same function as the significant sounds of language. That Lacock Abbey, miles or thousands of miles distant from me, the viewer, becomes present before me and "in me" (in my internal sensitivity) through its photographic image, which I perceive externally. Or I can also say that I, viewer, feel imaginatively transferred to the place where the photographer installed his camera to obtain that image of Queen's College; and that I am now seeing what he saw then through his camera. In any event, I can verify that what this image of Queen's College indicates is Queen's College itself. And all this without Queen's College having moved from its site, and without me having moved from mine, the site where I am stationary and looking at the calotypes in Talbot's book.

Moreover, these images of named places that I already knew have not taught me anything new since I was already

36. Talbot, 1844, Plate IX. Facsimile of an Old Printed Page. Plate XXIII. Hagar in The Desert.

37. Talbot, 1839 [1980: 26].

aware of them through my prior experience. But viewing them may have been useful in reinforcing what I already knew, boosting the repository of images I stored in my memory of this same place. In future, when I want to think of that place, perhaps my imagination will offer me Talbot's photographic image, which I perceived and recognised thanks to it having been published in *The Pencil of Nature*. It may be that, in my internal common sense, this calotype becomes mixed with previous images, those I obtained in my previous individual experience in those same places. It may even be that Talbot's photographic image prevails over all my own previous ones, imposing its presence as a memory of my calotype-viewing experience over its presence as a memory of my previous individual experience. In any case, what is clear is that, from that moment on, the image of Talbot's calotype, validated by my judgment as the true indicator of that specific site, will live in my internal sense together with the rest of memorable non-photographic images.

Viewing of calotypes of geographies or architectures that we do not know

A different case is that of viewers who did not previously know the buildings or spaces indicated by Talbot's calotypes. Someone who has never been in Oxford, or in Wiltshire, or in Paris, will not be able to judge from his own sensory experience whether the images Talbot offers of Queen's College or the Paris boulevard are true or false indices of those places. He who does not know them has no internal images on which to make a judgment, whether affirmative or negative, on this matter. The most he will be able to do —and it is no small matter— is to credit Talbot and accept in good faith that those monuments exist in those places, arranged in space just like they are shown in his calotypes. In reality, if we know how a camera works, how similar and faithful it is to human sight, we will have no difficulty in accepting as true indications of those buildings and places those shown in Talbot's calotype and let our imagination and our judgments be activated by them.

Since our memory does not store any remembrance of bodies or places where we have never been, the perception of these photographic images activates simultaneously in us the imagination of the bodies and spaces captured in them. Our lack of memories of them is here remedied thanks to the photographic image, which in this case acts both as perceived external body (the place and differentiated spots it contains) and simultaneously as internal image of what those spots indicate or mean. This is why the photographic paper and the internal image it produced in us allow us to judge that the buildings and places named are exactly what their images tell us they are. I have never been at Lacock Abbey, nor in the boulevards of Paris, nor in the Parthenon of Athens, nor in the pyramids of Keops; but having once seen the calotypes of those places, we can say that we already know them. We will probably not say that we know them as well as if we had actually been in those places, in front of those bodies, perceiving and experiencing how they occupy the space, what is the atmosphere that envelops them, which are the colours of their surfaces, etc. But what we can say is that we are cognizant of them, that we know of their existence and location, and that we know their major characteristics of shape, arrangement into parts, etc. thanks to the photographic image that Talbot or anyone else obtained of them and now offers to our perception through a calotype. Viewing them, for someone who did not know what they indicate and bring to the fore, now actually delivers teaching and knowledge that enables us to make new judgments on the perceptible bodies of the physical world of which we had never had a direct sensory experience.

But we must not forget that it will be a vicarious experience, so to speak. We have appropriated Talbot's image and made it our own, retaining it in our imagination and leaving it there as a possible remembrance of bodies we have never perceived yet know and can judge to a certain extent. In reality we have appropriated not only Talbot's image but the entire external and internal experience that led Talbot to produce this calotype and not another one. We know the College which Talbot selected for us, at the time of day he also chose, and from the angle he preferred. We know the boulevard he perceived, imagined and photographed for us. His calotypes refer us to his lived experience in those places and we appropriate it to make up for our lack of perception, imagination and judgment in those same places. Thanks to the photographic images we can feel, imagine and judge without comparison more than we would have been able to do if that experience had been denied us. But at the same time we cannot feel, nor imagine nor judge much more than what is given to us in and through the calotypes that Talbot, or anyone else, made so that we can see and imagine and judge them.

This remedy for our lack of experience, provided by the experience of the photographs' producer, actually allows us to recognise important differences between the photographic image and the one actuated by each person's living imagination. Daguerre, Talbot and the academics and commentators who follow their inventions with interest have all underlined the extraordinary richness of precise detail of which the calotype and the daguerreotype are capable. It is true that this is not the case without the presence of certain conditions of lighting, colour of the bodily surfaces, their state of repose, chemical preparation of the emulsifiable substance, etc., etc. But once these preceding conditions are ensured, the photographic image is extraordinarily exact in regard to the contours of bodies, relative distances of those who fall within the field of vision, and the arrangement and proportion of the parts of each one; plus the imprint of their volumes thanks to the gradation of the shadows projected in them, etc. But in this regard, there is a significant difference with the properties of the living image that visual perception automatically produces in us, as we have seen when recalling the structure of knowledge as understood by Aristotle. That image produced by the imagination is, yes, a likeness (*homoĩõa*) of the perceived body because it resembles it in the qualities perceptible by sight and other senses, as is the case with the material that sustains it. Yet that internal similarity of our imagination does not normally maintain with its original that relationship of exactness and precision that the photographic image maintains with the photographed body or bodies. It is true that, with regard to memory exactness, there will be many differences from one individual to the next depending on each one's capacity for recalling the details of what they have perceived and experienced. Surely a Picasso will have a far superior capacity than the rest of mortals for exactly memorising all that he perceives. In any event, if we have been in Oxford, in Paris, in Athens or in Keops, the images we are capable of recalling of those monuments and those enclaves, are they as exact, precise and detailed as their corresponding calotypes and daguerreotypes? Can we apply a "magnifying glass" to them, as Talbot advises the viewers of his calotypes to do, in order to continue discovering ever more tiny yet equally precise details drawn by nature on these calotypes? Are not the images we imagine more imprecise and vague given that they feature multiple different perceptions in themselves? In effect, they are surely not the remembrance of a single act of perception but rather the imaginative synthesis of multiple acts of perception, reunified by the internal common sense as a single more general and therefore less concrete and precise image than each one of the perceptions in which it had its origins.

We could think that the definition and exactness of the photographic image, compared to the vagueness and imprecision of the images we imagine and recall after having perceived them, should satisfy us once and for all. That, since the empirical sciences, applied to photography, have succeeded in offering us images more exact than our own, it would be fitting to replace our direct experience of the physical world with the photographic images that others take for us, seeking to make up for our deficiencies. This is in fact what Talbot implies when he reproduces those physical bodies born of art which he also offers as plates in his book. If you have not seen the bronze bust of Patroclus, nor the drawing of Hagar in the desert, don't worry, we will offer it to you in these facsimile calotypes. You will be able to have a perception of these same artistic bodies that we are copying as facsimiles on a scale of 1:1, without having to leave your home. Over time it will be possible for all drawings conserved in museums, all incunabula and manuscripts safeguarded in libraries, to be available to you through our images. You will not need to travel to se the pyramids of Keops: we will show them to you. You will not need to travel to Athens to see the Parthenon: our calotypes will show it to you effortlessly, and at a fairly reasonable price.

It is easy to understand that in reality we do not accept this proposal, or would only do so if we were manifestly incapacitated for enjoying the direct experience. If I am never going to travel to the Moon, the images I am shown of the lunar geography will do very well for storing in my internal common sense the images and memories of such places and for judging similar phenomena based on them. But if I reckon that I will be able to travel to Paris, to Athens, to Jerusalem or to the Alhambra, I will accept the calotypes that show me those places only as a vicarious and provisional experience. Regardless of how good they are, I will hardly prefer them to those I can obtain for myself, thanks to my experience. What's more, the more precise and exact and enjoyable for perception the photographs of such places are, the more the desire will grow in me to visit them for myself and to perceive them and imagine and remember them myself, to thus acquire my own experience. I may even produce a few photographs at different times of day and weather conditions and from different perspectives than the ones I know from photographs that are not my own. The first photographs I knew of these places, those produced by Talbot for example; plus the images, memories and apprehensions they automatically caused in me thanks to my direct perception of those same sites; plus the photographic images I took myself *in situ* to reinforce my experience and the repository of images in my memory, all this will constitute the arsenal of images available to me for remembering and judging what can be seen and what not in those places, and what is what in them, and what is next to what, or far from what, *on the spot*.

Once again we come up against the fact that the photographic image's exactness is a double-edged sword. On one hand, this exactness transforms into a very useful tool for scientific and archivistic illustration. If we search for iconic substitutes of precious graphic documents that are worth preserving for their documentary or artistic value (documents, drawings, engravings), the calotype facsimiles will provide us with an extraordinary solution. The photographic images will not have the colour or smell or touch of the originals, but in everything else they will be alike. And as regards Botany and Zoology, we have already seen that the illustrators of articles and books on these sciences have placed high hopes on the procedure of exact photography once it succeeds in resolving everything that is unfortunately still imprecise in it.

But this same exactness of photographic images does not *eo ipso* make them necessary substitutes of the personal experience; rather the opposite. We do not think that the best photographic images are generally better than a perceptive, imaginative and judicious experience of our own, one that we could experience oneself if one were to visit these places. Though at the same time these highly exact and precise images, which are not our own, and which we assume we would never be able to obtain for ourselves, can cause an aesthetic experience not in front of the places they indicate but in front of the photographs themselves, for the way they indicate or signify those places. We thus move closer to the experience of the photographic image not as an auxiliary means of science or of archiving but as an autonomous means for artistic expression and aesthetic enjoyment. We can see this more clearly if we discuss the second family of calotypes from among those which Talbot decided to include in *The Pencil of Nature*.

Viewing of calotypes of common and anonymous bodies

Next assumption: that of common and anonymous bodies, indicated by as many of Talbot's calotypes. They are a haystack, a farm, the entrance to a farm; or china or glass items, or a bookshelf, or some lace, or a basket with fruit. We all know what they are, we have encountered and interacted with them hundreds of times in our daily life. We did not need an Oxford education to know them, nor travel to Paris to know they exist and what they are. We have them in our memory, they form part of our ordinary experience and can name them precisely by means of common names.

True, we do not know these unique bodies photographed by Talbot specifically, but nor do we need to. Talbot does not present them by their names, like Queen's College in Oxford or Lacock Abbey, because they do not have any. This is precisely why the vision, memory and judgment of these objects occurs in us immediately, effortlessly. This is what Talbot says in his comment to plate VI, *The Open Door*:

> We have sufficient authority in the Dutch school of art, for taking as subjects of representation scenes of daily and familiar occurrence. A painter's eye will often be arrested where ordinary people see nothing remarkable. A casual gleam of sunshine, or a shadow thrown across his path, a time-withered oak, or a moss-covered stone may awaken a train of thoughts and feelings, and picturesque imaginings.

Talbot knows, from his own experience, that the perception of an image generated by light, like his calotypes, can update the levels of human knowledge in us all: imaginations, thoughts, emotions. They are all linked together like the carriages in a convoy. But since they are such common bodies, and given that we are so perfectly aware of what they are and that they exist, we can ask ourselves: but what should we photograph such bodies for? What do they have that other similar ones don't, and that we have no difficulty recalling?

It is precisely on the basis of this astonishment, this curiosity for the lack of rarity or grandeur, or picturesque character of the realities indicated by these calotypes, that the viewer can start to observe each one of the images more closely. This sets off an enquiry not into *what* the image is indicating, for it is quite clear, but *how* it is doing it. Instead of paying attention to the represented contents, we start to take an interest in the way Talbot wanted to represent them thanks to the photographic medium he has mastered. Our visual, imaginative and intellectual experience of these anodyne bodies allows us to stop delving into our memory and concentrate on the present of the vision —on the view of this calotype, of this image.

We now start to visually discriminate the differences between the spots that make it up. The most opposing ones —white next to black— sketch a perfect line on their common limit. These calotypes contain lines, some straight like the bookshelves, others curved, like the vases and bottles and pieces of fruit, or the pattern of the lace. Some lines are parallel to others: the limits of each book on the shelf; others, perpendicular, like that of those same books and the shelves; others oblique, like those of the limit of the ladder leaning against the haystack, or the broom against the house façade. We are thus confronted by a veritable *drawing* of lines created by nature without the intervention of a human hand.

And since we perceive all kinds of lines, we also perceive all the *figures* they delimit: triangles, circles, rectangles, and all those that outline a natural body. Talbot refers several times to the different *delineations* with which the same body, e.g. the bust of Patroclus (plates 6 and 17), can appear in one calotype and not in another depending on whether it is taken from one angle or another. And if several bodies are being photographed, their different delineations will set up a dialogue between each other, like in the calotype of the china and that of the glass. In other cases, certain geometric figures will let themselves be read —intellectually apprehended— as indices of spatial depth, e.g. the triangle composed of the ladder against the wall and the shadow it throws on the ground.

But before the linear limits of the photographic spots are the spots themselves, each one with a greater or lesser continuous spread, in two dimensions — the same as colour spots on canvas. There is no colour on a calotype, as we know, but there are patches, some more or less light, others more or less dark, in unlimited gradations. Homogeneous dark patches, intensely dark, entirely unusable for scientific information on specimens of species, here appear as an element of high photographic significance. The densely dark rectangles we perceive in contrast with the contiguous illuminated surface in the calotype titled *The Ladder* not only make us perceive the dark part as even darker, and the illuminated part as more illuminated due to being mutually opposed; the one and the other also allow themselves to be intellectually apprehended as the realities of which they are the index. The dark patches indicate the interior of the hayloft, the illuminated ones its exterior; and one and the other physical reality is opposed to the other as much as do the patches that indicate them. The same happens with the very dark backgrounds of the bookcase, or of the china or glass bottles. Or with the black background behind the bust of Patroclus: all the differentiated visibility that the former ones have lost has been gained by the latter image.

Also on view here is the abundantly rich gradation of the semitones in the spots, pondered a hundred times by inventors and commentators on daguerreotypes and calotypes. They are the indicators of the bodies' volumes, once present before the camera, and of each one of the bumps on their surfaces. They also indicate the depth of the spaces, like that softly illuminated window at the back of the room in shadow that we glimpse through *the open door* in Talbot's eponymous calotype (plate 6). A backlit figure in front of that interior window would have achieved a similar effect to that of the presence of José Nieto, the Queen's chamberlain, next to the lintel of the illuminated door at the back of Velázquez's *Las Meninas*.

The grading of the tones also indicates the textures of the stone, of the plants, of the fabrics, of the glass panes. And they are presented with such a wealth of nuances, and with such exactness and precision of detail, that they spark in our imagination memories of their touch, their hardness or softness, their roughness or smoothness. The chronicle of the presentation of the daguerreotypes to the members of the Chamber of Deputies in July 1839 underlines it apropos the landscapes[38]. And Talbot, apropos the bodies taken in the foreground by his calotypes, also. Thus, in his comment on the piece of lace (plate 20), he observes that, though we are only seeing it, we also feel it between our hands, as if we were fingering "all the small delicate threads which compose the lace"[39]. This happens because, as well as perceiving, we can also imagine it. The same with the texture of the pineapple and the smoothness of the skin of the apples, in the calotype of the still life (plate 24). And on the pieces of glass photographed by Talbot (plate 4) he records this synesthetic impression: "The photogenic images of glass articles impress the sensitive paper with a very peculiar *touch*".

The same happens with the lustre of the bodies, which appear as flashes of light on the glass surfaces in, for example, plate 4 (Glass Articles), or on the lamp by *The Open Door* (plate 14). The precision of its position and intensity is not only indicative of the volume and texture of these bodies but also of their position in space vis-à-vis the light source; and of that light source vis-à-vis the position of the camera. These flashes of light provide the entirety of the image with a diversity and animation that very much resembles, in general, that of the bodies that surround us. Furthermore, sheens on bodies can even constitute specular images, like that of the Lacock Abbey tower on the river Avon (plate 15), or water on the pavement of the Parisian boulevard (plate 2). One or several specular images, continuous or discontinuous, can coexist within the same photographic image.

The precision of detail attainable by daguerreotypes and calotypes, far higher than what the most experienced draughtsman or painter could achieve of the same bodies, therefore operates here for the benefit of our perception's enjoyment. It lingers over such details because exercising our sight, for its own sake, is an enjoyable practice for us. Our activity in this case is not aimed at either eating or travelling or any practical purpose; rather, it is an end in itself, as Aristotle observed. One of the signs that we love knowledge for its own sake, he recorded in his prefaces to *Metaphysics*, is that we love our sight more than any other external sense because it allows

38. "The extraordinary minuteness of such multiplied details as was shown in the Street views, particularly in that of the Pont Marie, was much admired. The slightest accidental effects of the sun, or boats, the merchandise on the banks of the river, the most delicate objects, the small pebbles under the water, and the different degrees of transparency which they imparted to it, -every thing was reproduced with incredible exactness". "Daguerre's First Daguerreotypes", The British Literary Gazette, 13 July 1839; repr. in Newhall, 1980: 18.

39. Talbot, 1844, comment to Plate XX, The Lace.

us to discriminate more perceptible differences than all the other senses[40].

Furthermore, the photograph's viewer —the living human being, the only one capable of contemplating it— cannot prevent some of the images accumulated in his internal common sense from activating as memories when he instantly perceives a precise photographic image. They are the ones deposited in him by previous acts of perception of bodies as common as those he is now perceiving in that photograph. Beyond that, these internal images can activate in us memories that are not only visual but also acoustic, tactile or odoriferous, stored in the memory of our life experiences. The photographic image, which is per se only visual, thus has the ability to activate memory-related images corresponding to all external senses. We do not externally perceive these non-visual qualities because the photographic image does not contain them, but we can imagine them internally because the photograph awakens and convenes them in our present. The best photographs can thus enrich their current perception in a memory-related, imaginative manner, enriching the viewer's current experience. The view of a photograph becomes an intense activity involving the viewer's full sensibility, both external and internal.

For good measure, each one of the graphic elements that make up the whole of a photograph can be subject to a particular *pattern*[41]. This is not just another element of the image but a certain common measure among the perceptible elements, one that arranges them. This means that the lines, the figures, the spots, the gradations, the lights, the shadows, the specular reflections on water or mirrors can be repeated *n* times on the image's surface and make up three, eight, twenty appearances, not disorderly but in a pattern. This, for example, is what the lines and patches do that correspond to books arranged on a shelf; or the figures, patches and gleams corresponding to glass bottles and tumblers, also arranged on a shelving cabinet; or the pattern followed by a crochet weave in Talbot's image. The variants are all of the same genus or species: books, glass tumblers, crochet pattern. But they are variants because, following a common pattern, they differ from each other by particular accidents of relative position, size, form, structure, etc.

None of these individual variants stands out so much that it makes us hesitate about the common genus to which the arranged elements belong: books, bottles, china pieces. Even less so the more orderly they are in relation to each other, and all of them in regard to the whole, according to the same pattern, e.g. the horizontal surfaces of the cabinet shelves. The viewer, in an orderly set, can perceive and judge which are the constant elements (glass tumblers, books, crochet work), and which are their variants (each one's position, sizes, structure, sheen, textures, etc.). Also which is the rule followed by the variants, thanks to which they appear as a patterned whole of variations between certain limits, e.g. separation distance between them. This order between the variants can refer to what precedes or follows in the space: which variants will be closer and which ones further away from the viewer; or, according to his perspective, which trees planted alongside a road are closer and which are further away (actually none of them, since the photographic image is a flat surface). Or referring to the top and to the bottom according to whether the variants occupy a higher or lower place on the surface of the image, e.g. books placed on the top shelf, or the bottom shelf, or on the intermediate shelf. Or according to an order of generation, e.g. parents and offspring in a group portrait, etc.

In addition, the viewer can perceive and apprehend those variants of that rule that are divergent to such a degree that they in fact cease to be variants and become exceptions. If all the books are placed vertically on the shelf, all of them are variations (by position, size, texture, etc.) following the same pattern. But if there is only a single one lying flat, that book is no longer a variant of the standard but an exception: because it has escaped the limits of the rule, it breaches that rule. The number of variants contained in a same orderly set allows the number of its exceptions to also be higher or lower and coexist with the variants without cancelling the rule that arranges them visually and intellectually. If the bookcase thus contains twenty books, having two or three lying flat in contrast to the rest does not override the rule, which is that the books lean into each other vertically. But if there are three volumes on the shelf, and two of them are standing vertically and the third one is lying flat, it would no longer be easy to grasp whether there is a rule and what that rule is, which are its variations and its exceptions.

All this is perceived, calculated and judged by the viewer. As he perceives the image, he more or less consciously makes conjectures to himself on whether there is an order structuring the image and what that order is. He can verify this hypothesis through new perceptions, while imagining and reasoning on the possible causes of such order (e.g. that the owner of the books is an orderly person, or that the French like to plant trees along their roads); and which are the causes of the exceptions (e.g.

40. Aristotle, Metaphysics, A, 1, 980 a 24-27.

41. Talbot, 1839 [1980: 24].

that the volume is lying flat on the shelf, unlike the others, because it does not have the consistency to remain upright).

The match between the perceptible means available to photography (lines, figures, spots, tonal gradations, lights, reflections), and their significance, the indication of which is the order between the parts that structure the whole, and the whole itself, can be so perfect that in reality its simultaneous perception fills us with astonishment and pleasure. In this case, it is not that the images of our memory and our grasp and judgement are completed or confirmed by the photographic image but that the establishment of the photographic image confirms what our memory, our imagination and our knowledge can feel and judge about it. The image does not show us a new content because everything it contains is common and known beforehand; but the image shows itself and makes us apprehend what it actually is, what it is capable of precisely indicating through each one of its resources, and which ones it has successfully employed to achieve it, in this case.

The perception of the common image initially activated our imagination, memory and intellectual grasp, but since we judged that there was nothing special to see, imagine or apprehend, the image again attracted us to itself to teach us other things. And in this counter-movement to the first one, like a ball that returns to him who threw it after bouncing off the wall, our visual perception and our internal capacities for knowledge become more attentive and inquisitive and our capacity for intellectual grasp more contemplative. It is about contemplating the photographic image as *spectacle*, what in Greek was denominated *theorein*. We, *spectators-contemplators* of the photograph, are as frozen before it as the bodies indicated by their spots are on the iodised plate or the paper. But although the spectator-contemplator and the contemplated-spectacle remain immobile, an intense sensory-cognitive activity occurs between both. The spectator investigates while perceiving, imagining and judging the image's components, like he would do if he were in a theatre, perceiving, immobile, how the characters interact with each other and with the space that surrounds them. And the photographic spectacle, like the theatre one, offers itself up with all the force of its perceptible and intelligible forms of expression.

This activity of the spectator's has something of the scientific enquiry and research about it. Faced with the graphic elements of the image, he suggests hypotheses to himself on the physical causes that have produced the iconic phenomena, and on the correlation between them within the image, and on what they indicate. The image of the common bodies has transformed the spectator into an inspector, into a thinker: one who exercises the common knowledge available to him, with an interest analogous to that of the natural scientist who activates his specialised knowledge to find the most convincing causal attribution on the phenomena he is perceiving without being able to find an explanation for them. A sign of this is the practice Talbot proposes to the viewers of his calotypes: bring along a magnifying glass and use it for perceiving those details of the image's interior that have passed you by at first sight —because they are *there*. The magnifying glass is not a microscope but functions similarly. So, with the help of this tool, delve into the perceptible phenomena offered by my calotype, because surprises, confirmations and new hypotheses await you on the now amplified field of vision. In this dialogue between spectator and spectacle, the photographic image will gradually negate or confirm those hypotheses which the spectator will have suggested to himself in the course of his inquisitive activity. And if he comes across findings and confirmation of his assumptions, they will be saluted with an *eureka!,* like those of Archimedes when he discovered the displacement of fluids by the volumes submerged in them.

Admittedly the calotype, like in general any photographic image, remains a motionless body, not only because it is pasted onto the corresponding page in *The Pencil of Nature* but also, above all, because it is an inanimate being. We have not entered into a dialogue with a living being possessing perception, memory and intellectual grasp like we do. Yet from another point of view, we can say that we are conducting a dialogue, when viewing the calotype, with something endowed with such powers, like a living being. The image is so vivid, its components so animated by their number game, differences in quality and quantity, and by the oppositions and order between them, all of it perceptible, memorable and intelligible at the same time, that we are minded to think that something has put life into that image; that someone has infused the components and the whole of the photographic image with the breath of life.

How should we understand that nature "sketches" in each photograph?

Talbot has an initial answer in this regard: photography is a product of nature. *The pencil of Nature* has sketched by itself all of those incredibly exact components and details of the image, without any intervention of the sketcher's hand. The perceptible effects on the emulsifiable substance of the plate or paper are the direct result of a chemical action of nature on them. She has produced them with a rigour and optical and chemical perfection of which the human hand is incapable when drawing or painting. The *amateur* of photography, the young student who wrote enthusiastically to Talbot, dares to assert that nature draws with a hugely personal style of her own. "One artist has one touch for foliage, another has another and, based on this characteristic trait, we can divine the represented tree and perhaps name the artist. But your photogenic drawing [of the calotype] would be a portrait, it would exhibit the *touch* of the Great Artist: Nature. And, by copying that touch, in a short time our modern artists would acquire a facility & accuracy & decision in the characterizing of trees & delineating their respective foliage, as has never been surmised in all bygone Ages" (Butler, 1840).

Talbot considered himself a philosopher of nature[42], like the natural sciences researchers of his era: chemists, physicists, opticians, astronomers, biologists: all of them are denominated thus. The origin of this expression goes back to Aristotle, the first of the philosophers to cultivate most of the observational-method physical sciences that have been studied until the present day. Common to all these sciences cultivated by Aristotle, Galileo, Newton, Linnaeus, Berzelius and Talbot is the principle that *physis*, or nature, is a subject capable of action: nature acts (*hē phýsis poiei*), says Aristotle. And *it does it for something*, or, to put it in the negative: *nature does nothing in vain*, it does *nothing irrational*. What this first principle of natural history affirms is that the processes initiated by nature are neither useless nor irrational, because nature, in everything it does, accords with right reason (*kata ton logon*), or as if it were endowed with reason.

This principle born with Aristotle was endorsed by a painstaking observation of natural bodies and the intelligent grasp of the principles and causes that could explain them. True, stating that nature acts, as Aristotle affirms, or that it *draws*, as Talbot says, means anthropomorphising the *physis*. In the case of the Greeks, it was actually rather a matter of *deomorphising*. For the Greeks, nature was a god, or if not, something divine: designed and set in motion by a divinity. Which is why the Greeks and their successors capitalised it: Nature. And why many physicists, chemists and cosmologists from Greek Antiquity to the era of photography continued to consider it as something divine deserving of a name of its own with a capital letter: Nature. Or, like Butler the student, the Great Artist. So when not as someone or something divine, at least as something comparable to the best in the human being and his superior rational and operational capacities, but raised to the nth power. Nature is a subject capable of rationally knowing and arranging the components of the cosmos as a whole; and of performing the precise calculations for its dynamic to be maintained on a cosmic scale; and of endowing its parts with operative purpose, accompanied by the right morphological design, far more powerful, effective and aimed at the greater good and on a scale incomparably greater than the ones that are comprehensible to the sciences that humans do.

If we thus accept that nature has the power and will to draw, as Talbot proposes and his followers accept, and that it does it in a far more exact and divine manner than the human hand, the main analogy of all artistic action is nature; and man only its imitator. This is certainly how Butler the student saw it, convinced as he was that the artists of his era could quickly and efficiently improve their craft if they had at their disposal a good arsenal of calotypes produced by nature and would wish to imitate them. Talbot and his followers implicitly accepted what Aristotle had proposed as the principle of artistic production (*téchnē*): *mimetai hē technē tēn physin* – art imitates nature.

Certainly, once we admit that nature is capable of creating proportioned, harmonious and functional ensembles of a perfection unattainable by human beings, the conclusion on which has to be the principle of the productive-artistic action is clear: human productive action is artistic when it acts as nature does, producing harmonious, proportioned and functional ensembles on matter. But given that human beings are not actually capable of doing this as excellently as nature, they have to at least attempt it by imitating her. "It is obvious that in everything we have to imitate the best" (Aristotle, *Nicomachean Ethics,* VII).

This conception of artistic production, which Aristotle established as a principle of his *Poetics*, was continued by philosophical tradition and maintained until the Enlightenment with barely any modification. Kant and Voltaire speak of artistic imitation of nature no less than Diderot does. He, in his *Essais sur la peinture* (1765), exalts nature as the purpose of all arts.

> La nature ne fait rien d'incorrect. Toute forme belle ou laide a sa cause, et de tous les êtres qui existent, il n'y en a pas un que ne soit comme il doit être. [..] Et si les causes et les effets nous étaient évidents, nous n'aurions rien de mieux à faire que de représenter les êtres tels qu'ils sont. Plus l'imitation serait parfaite et analogue aux causes, plus nous en serions satisfaits[43].

42. Talbot, 1844. Introductory Remarks.

43. Diderot, 1765, 11-12.

Photography does not imitate nature, it is simply its analogue

It is unsurprising that Daguerre and Talbot should have presented their inventions as a great opportunity, once and for all, for plastic artists not to fail in their approximation to nature as a model to be imitated. Although, analysing it in greater detail, the daguerreotype and the calotype had actually increased yet further the distance that separates the Great Artist, Nature, from the small human artist who tries to imitate it. Because what Nature could do through photographic optics and chemistry, in quantity and quality, in minimal time, was once again beyond the reach of the draughtsman, the engraver, the painter. Not even with massive dedication of time and effort was the 19th-century artist assured of being able to imitate the results sketched by Nature in a few minutes, perhaps seconds, on emulsifiable substances. And despite everything that artists could learn on the real path of learning based on calotype drawings, they would never be able to emulate the photographic productions of Nature.

Nature imitates nothing and no one, but is imitated by everyone (this is how Kant formulated the notion of "genius"). One could not even truthfully affirm that Nature copies itself when it produces a calotype, because in reality she does not imitate but directly creates. What she produces on emulsifiable paper is not an imitation in itself but an exact, though limited, *analogue* of that which she operates in the physical world. Photography, as a chemical and optical product operated directly by light, inexorably distanced itself from the rest of the arts, all of which were hitherto *imitative*. Photography does not imitate Nature; rather, it takes her in and appropriates her active power in order to keep some of her effects on the substances of the physical world: physical substances are, of course, the emulsifiable plate or paper.

We know, moreover, that photography does not take whole bodies, that it does not appropriate all the effects that nature is capable of causing in each body of the physical world. We know that the calotype excludes colours, transfers movements and many other actions, passions and physical qualities discernible by the senses which do not appear in the photographic image. That is why it is so exact to consider each photograph not as a *copy* or an *imitation* of bodies under the light but as a natural *analogue* of those bodies. Aristotle (in this he follows Plato) used the analogy concept to understand the properties, basically unequal but comparable under some aspect, inherent to heterogeneous entities. Although, for example, plants and animals belong to kingdoms of heterogeneous living beings, we can nevertheless point out that the roots of plants are *analogous* to the mouths of animals given that plants and animals draw in the nourishment that sustains them through one or the other. Roots and mouths are as heterogeneous as plants and animals; yet their ingestion systems can be deemed to be analogous due to their function. This also applies to the calotype image or the daguerreotype and the natural world dominated by its own physical laws. Both are heterogeneous realities and yet it is rightful to understand the properties of one —the photographic image— by analogy with the properties of the other —the physical world, for both are operated by the same agent, in a limited manner in the former, limitlessly in the latter.

None of the arts that preceded photography could boast of operating by analogy with nature; all of them had to settle for being nature's imitators. And in the case of the mechanical arts, those that Diderot enthusiastically defended in the *Encyclopédie*, they do not even imitate it but simply use it. Well then, the rupture of photography with the traditional imitative arts (drawing, engraving, painting, theatre, literature) and with the mechanical arts that preceded it (carpentry, goldsmithing, forge, lithography) there were at least three important consequences in what concerns us here: the emergence of colourist painting, the (failed) proposal to subordinate photography to painting, and the gradual emergence of the photographer artist, proud to be only and no less than a photographer.

Consequences for the arts that do imitate nature

The first of these consequences is recorded in French painting from 1839 onwards, and it is this: the immediate decline of *realist* painting, as had hitherto been the neoclassicism of David or Ingres; and the unstoppable rise of *colourist* painting, which began with Delacroix, a contemporary of Daguerre and Talbot and a member of the Société héliographique from 1851. Colourist painting also included those who came after Delacroix: Renoir, Monet, Pissarro, Seurat, Sisley, Cézanne, Van Gogh, Matisse. Faced with the first daguerreotypes, painters understood that they would never compete with the new art in the precise recording of reality. The mastery of David's or Ingres's drawing paled in comparison with the drawing of the very creator of forms under light and on papers or on photosensitive plates: nature. But what photography excluded from itself, by dint of its physico-chemical limitations, was actually colour. There was here an expeditious path for painting that photography would never be able to tread (it started doing so well into the 20th century). Painting as painting was to advance as much as it distanced itself from what photography as photography was already able to do: precision in drawing.

This is why European painting did not even attempt to employ colours with local exactness in imitation of nature; instead it was audacious enough to modify that exactness whenever it suited it for creating a general *impression* of colour on canvas. Hence the *impressionistic* style of the French painters of the second half of the 19th century and Turner's lambent impressionism in England. I have discussed these relations between the birth of photography and painting with colours elsewhere (Llano, 2017), to which I refer. I only add this comment here: what Talbot had recorded as a weakness in landscape painters, namely that they were only capable of creating a general impression of colour ("contenting themselves with a general effect"[44]), was precisely where the impressionist painters who followed gained their strength.

Does photography serve painting as much as its inventors assumed?

The second consequence was the assumption by Daguerre and by Talbot that the photographic image could be used as an additional tool for painting. Daguerre was a painter of dioramas, Talbot a scientist, but both understood that their inventions could interest draughtsmen and painters in making preparatory sketches for their paintings. Just like a painter makes pencil notes of the model or landscape he has set out to paint and will then use them as a template in composing the canvas, Talbot suggested using the drawings made by Nature on the calotypes as exceedingly exact sketches, obtained, moreover, in record time and almost effortlessly.

> One advantage of the discovery of the Photographic Art will be, that it will enable us to introduce into our pictures a multitude of minute details which add to the truth and reality of the representation, but which no artist would take the trouble to copy faithfully from nature. Contenting himself with a general effect, he would probably deem it beneath his genius to copy every accident of light and shade; nor could he do so indeed, without a disproportionate expenditure of time and trouble, which might be otherwise much better employed. Nevertheless, it is well to have the means at our disposal of introducing these minutiae without any additional trouble, for they will sometimes be found to give an air of variety beyond expectation to the scene represented[45].

One of the first painters to have followed Talbot's advice was the Edinburgh-based landscape artist and member of the Royal Scottish Academy, David Octavius Hill. Talbot knew of him through David Brewster, an acquaintance of his who, in a letter of 3 July 1843, passed on the following good news to him:

> You have probably heard talk, even if only as a distant echo, of the great moral conflict occurred in Scotland: how 500 pastors had given up their manses, chaplaincies and stipends for reasons of conscience and have formed a *Free Church* free of secular interference. A very notable artist is undertaking a great historical painting that will represent the *first General Assembly of the Free Church.* I got hold of him – showed him the calotype, & the eminent advantage he might derive from it in getting likenesses of all the principal characters before they were dispersed to their respective homes. He was at first incredulous, but went to Mr. Adamson [a chemist by profession and one of the first calotypists to set up in Edinburgh], and arranged with him preliminaries for getting all the necessary portraits. The results obtained far exceed the most optimistic expectations. They have taken, on a small scale, groups of 25 persons in the same image —all of them placed in the positions desired by the painter— and to help the painter in completing his picture, very large images of each individual were also taken. Mr. David Octavius Hill, the painter, is in the process of associating with Mr. Adamson and they propose to apply the calotype to many other purposes of a highly popular nature, and especially in painting large pictures that represent different collectives and classes of individuals.

David Octavius Hill was a painter, not a photographer, but allowed himself to be convinced by Mr. Adamson to obtain on calotype the portraits of many of the participants in the Insurrection Assembly against the Anglican Church. Many of them were then employed in the monumental painting completed by Hill in 1846, *The Disruption of the Church of Scotland 1843*. In it he gathered together 457 persons of the approximately 1550 who had participated (Hill himself included) in the assembly of 23 May 1843 in Tanfield Hall.

What is fascinating about this story is that this oil painting by Hill does not measure up to the calotypes made in a supposedly instrumental manner, as a means to achieving with extreme exactness a large-scale collective portrait on the canvas. Most of the calotypes resulting from Hill and Adamson's collaboration are masterpieces of photographic portraiture, an application of the new art of which there were barely any noteworthy examples at the time (Talbot himself

44. Talbot, 1844, comment to plate X, The Haystack.

45. Talbot, 1844. Introductory Remarks. Also Talbot, 1839 [1980: 28] had regularly avoided it). So far from subordinating itself and serving pictorial art as Talbot and Daguerre had suggested, photographic art soon became independent of it as much as the Church of Scotland had done from the Anglican Church. Given the extraordinary difficulty of taking good photographic portraits, Hill's calotypes, which had achieved it, turned out not to be the right tool for painting from them a detailed portrait of the participants. What is more, it was probably not even likely that the calotype would be considered a tool for good practice in painting, only that in this case it had not been used appropriately. It was more a matter that photography could *not function at all* as such a tool at the service of painting. Hill was a professional painter and had been commissioned for this group portrait for his worth in this artistic field. Yet he was unable to paint that oil of the Assembly in Tanfield Hall with the same mastery with which the photographic art of the portrait had been invented. Paul Strand, an unconditional admirer of Hill as a photographer, wrote about the source from which the painter had obtained the means to produce that photographic feat, from which a major pictorial fiasco also happened to result.

The results of Hill's experimentation reveal a confident immediacy and a quality of observation that, together with his extraordinary feeling for the people he portrayed, have made his portraits remain unsurpassed to date. Constructed with extreme simplicity through the direct and austere arrangement of large masses of dark, broken by the head, the hands, or some part of the dress of the people portrayed (built though it was upon the chiaroscuro of the old masters), Hill's portraits give the eye at once an impression of simple grandeur and of true human nobility. The photographer always underscores the energy, never the weakness, of those who pose, although his portraits lack any kind of sentimentality, that is to say, they are free of any attempt to make them prettier.

Very possibly these men and women were not torn by inner conflict as most of us are today. For they appear sure of their direction in life to this extent –that they seem to have known what life meant to them and what was truly of value to them in it. This kind of inner strength Hill saw and recorded, and it has its aesthetic correlation in the solidity of the plastic structure, in the indestructible dignity of his light and shadow arrangements —as simple in their effect as they are difficult to achieve.

But what undoubtedly makes them appear more alive is the ingenuity and freedom from any theory with which Hill approached the new medium. For in his photography he was not concerned or restricted by the academic norms of the time, as was surely the case in his painting. It is interesting to observe how his painting, in which he complied with the academic norms of his time, has been consigned to oblivion, while his photography, in which he expressed himself with full personal freedom, remains alive.

Despite the primitive materials with which he was compelled to work, the exposures of five to fifteen minutes in bright sunlight, and even though George Eastman was not there to tell him that all he had to do was press the button and he would take care of the rest, despite all that, this series of photographs has victoriously stood the test of comparison with nearly everything done in photography since then. For me, they are the most extraordinary affirmation of the possibility of controlling a machine, the camera, in a completely personal way.

Strand's comment appropriately illustrates the simultaneous relevance of the perception of the graphic elements and of the intellectual comprehension of what they indicate, in the aesthetic experience of the photograph's viewer (Strand in this case). The emergence of the face and hands of those portrayed by Hill, from the shadows towards the light, was, according to Strand, the right way of signifying the internal self-assurance of those men and women, which made them appear with great dignity despite being common citizens of the century in which they lived. The viewer's experience, which includes the inner makeup of those portrayed thanks to the calotype's solid external structure, is simultaneously an act of perception, of imagination and of intellectual grasp that is extremely intense and exciting. Photography makes this experience possible without the need to imitate any of the previous arts (which were imitative in themselves), and without the need to add literary or *scientific* discourses to the act of photographic viewing.

The example of Hill and of a few other photographers we will name later had already proved that the suggestion of subordinating photography to painting was going to lead nowhere. It is understandable that Talbot and Daguerre would want to defend and secure the different practical utilities facilitated by their discovery. Among other things, the financial returns from their inventions depended on it. The more draughtsmen, engravers and painters were convinced of the usefulness for their future work of the drawings generated by light, the more their use would spread and the more the financial returns from marketing them would increase. But it is also safe to say that, in regard to that lucrative interest, both inventors also put forward arguments intimating that photography was truly a good servant of painting. Talbot reasoned it thus: since photography is a drawing produced by "the inimitable pencil of Nature"[46]; and since pictorial art is an imitation of nature that normally starts with a drawing or sketch on the canvas, what would be better than for draughtsmen, engravers and painters to imitate nature based on the photographic drawings that she herself has produced on the calotypes, with a precision of detail and perspective of which they themselves are barely capable?

But such reasoning contained, in my opinion, a few fallacies. Firstly it was obvious that imitation through painting based on imitation drawn with pencil or charcoal on the canvas, itself drawing from the calotype images, put imitation on another level and therefore multiplied the possibilities of failure (as in Hill's painting). Because when an engraver or a painter draws a sketch with pencil or charcoal, either on paper or on the surface to be engraved or the canvas to be painted, in reality he has already started to engrave or paint it: that drawing or charcoal sketch is already an intrinsic part of the final result. Furthermore, the hand and the eye that produces either of them are the same: those of the painter. But the calotype, resulting as it does from nature and chemistry and optics, is not immediately usable by either the draughtsman or the engraver or the painter. When they start to use calotypes as their starting point, they will first try to imitate them by transferring it to a drawing; and they will return to the attempt of again imitating those drawings in order to transfer them to painting with colour. It is inevitable that nature will have been lost after so many transferring attempts. The outcome of calotype-based imitative painting would be like those shadows of real beings, unique yet weak and inexact imitations of true reality to which the unhappy inhabitants of the cavern are doomed according to Plato's myth.

Besides, suggesting that an analogue art such as photography be placed at the service of the imitative arts (drawing, engraving, painting) meant reversing the hitherto accepted roles of command and obedience in the arts: if nature does not imitate when it creates but is instead imitated by human productions, how to place at the service of human imitative arts this art that is the direct product of creative nature, which imitates nothing and no one?

Furthermore, the suggestion of subordinating photography to painting ignored the truth, already discovered centuries earlier, that the different perceptible materials give rise to different arts and results not transferable from one to another. While sounds give rise to music and colours to painting but not vice versa, the photosensitive substances that sustain the photographic images will give rise to neither music nor painting but to another different art: the one suited to the perceptible qualities of the substances in which photographs are generated and which support them.

In the case of Talbot and his *The Pencil of Nature*, there was still a subtle and elusive obstacle, but a very apt and therefore dangerous one, to assume the *imitative* capacity of photography. I am referring to the attempt of showing photography *à la page* with the usual pictorial *genres* of the era in which it was born.

Photographic imitation of reasons and conventions of pictorial genres

Talbot defended his invention, underscoring on every occasion that his achievements were obtained without the intervention of the human hand —something without precedent in the history of artistic production, as it in truth was. But it seems that at the same time he also wanted to show how much nature is capable of producing by itself, through photography, scenes or motifs corresponding to the different *pictorial genres*. Nature neither paints nor imitates in the calotypes, it's true, but it is capable of drawing still lifes, if not better certainly not worse ones than those imitated from nature by the master painters in this genre. Nature neither paints nor copies landscapes, but it is capable of heliographically draw *distant views*, if not better ones, at least not worse than those imitated from nature by landscape painters. Given that *The Pencil of Nature* proposed to showcase the faculties of the calotype and its usefulness as a tool for the sciences and for the arts, it is not surprising that its author insisted on the utility of heliographic drawings as sketches from which to make genre engravings or paintings. Thus for example, in his comment to the calotype of *The Open Door* (plate 6), Talbot observed:

> We have sufficient authority in the Dutch school of art, for taking as subjects of representation scenes of daily and familiar occurrence. A painter's eye will often be arrested where ordinary people see nothing remarkable. A casual gleam of sunshine, or a shadow thrown across his path, a time-withered oak, or a moss-covered stone may awaken a train of thoughts and feelings, and *picturesque* imaginings.

Talbot presents himself as a connoisseur of the Dutch school of painting and feels authorised by this to trial calotypes of scenes imitating the distinctive motifs of that school. His love for the detail and *picturesque* scenes of village life inherent to that school were an excellent guide for handling the camera's admirable

46. Talbot, 1839 [1980: 247].

capacity for exactly capturing any detail, in any setting. This is accredited by the calotypes *The Open Door* (plate 6) and *The Ladder* (plate 14), reproduced in *The Pencil of Nature*.

Then there is the imitation of the landscape genre. In his introduction to *The Pencil of Nature*, Talbot maintained that "the principal branch of the Photographic Art is the taking pictures of distant objects with a Camera Obscura". And this is demonstrated by the calotypes *Part of Queen's College, Oxford* (plate 1) and *View of the Boulevards At Paris* (plate 2). In his comment to the former he notes: "*In the distance* is seen at the end of a narrow street...". And to the latter: "A single carriage stands *in the distance* a long way to the right. A whole forest of chimneys borders *the horizon*" (the italics are mine). When arriving at the comment to plate 7, he declares: "Hitherto we have presented to the reader the representations of *distant* objects, obtained by the use of a Camera Obscura". But the calotype's capacity for reproducing the spatial scale inherent to rural or urban landscapes is again shown in the calotype *The Bridge of Orleans* (plate 12). In his comment to plate 15, Talbot is still pointing out how "the *distant view* of Lacock Abbey" was the first calotype he successfully obtained, in 1835. Talbot's admiration for this pictorial genre, and the possibility of zealously imitating it through the means of the new art is attested by these various photographic equivalents included in his book.

The graphic reproduction of monumental architectures was not, before Talbot, a pictorial genre bur rather pertained to the art of engraving. Napoleon rightly took along masters in this craft on his expedition to Egypt, to illustrate through engravings the magnificent volumes of pyramids and temples they encountered. Well then, it appears that Talbot also adheres to this genre of the engraving art in the numerous calotypes of the buildings and monuments of Oxford (Queen's College, Martyrs' Memorial, Gates of Christchurch), those of Lacock Abbey (general view and cloister), and in the calotype of Westminster Abbey. In the comment to this last one (plate 20), he observes:

> The stately edifices of the British Metropolis too frequently assume from the influence of our smoky atmosphere such a swarthy hue as wholly to obliterate the natural appearance of the stone of which they are constructed. This sooty covering destroys all harmony of colour, and leaves only the grandeur of form and proportions. This picture of Westminster Abbey is an instance of it.

That the soot of London's chimneys destroyed the harmony of colour originally presented by Westminster Abbey was undoubtedly a great loss for the Abbey, but not for the calotype, which of course was blind to this. But the paper imprinted by the light did have a good eye for "the grandeur of form and proportions" of the entire historic monument, which is why the series of calotypes of gothic architecture were included by Talbot in his book. The good results he obtained are the precedent for those other series of historic architectures such as those made by some of the members of the *Société héliographique* (Baldus, Bayard, Le Gray, Le Secq and Mestral) at the request of the French Government shortly thereafter, between 1851 and 1854.

The last of the calotypes featured in *The Pencil of Nature*, a close-up of *A Fruit Piece* (plate 24), is an imitation of the pictorial still life genre. Talbot does not explicitly note this, but it is so clear that not even the ensuing comment has anything to do with this plate and with its theme —instead it deals with the "almost unlimited" possibility of obtaining copies of the original calotypes (something which, incidentally, anticipates Walter Benjamin's well-known observations on the unlimited reproducibility of a unique work of art in the era of industrial reproducibility).

We have already discussed the absence of photographic *portraits* in *The Pencil of Nature*. It appears that Talbot had not succeeded in obtaining results that deserved to be included in the first of his books on the calotype despite having abundant experience in attempting it (Talbot, 1841, 1844). What is certain is that he greatly appreciated portraiture, that other classic genre in which painting triumphed. This is what he asserted in the comment to calotype 14, *The Ladder*, unique in that the author captures a group of people (specifically three, two with backs turned) and where he promised himself to be more successful with portraiture.

> Portraits of living persons and groups of figures form one of the most attractive subjects of photography, and I hope to present some of them to the Reader in the progress of the present work.

Talbot had already learned about the good progress of individual and group portraits taken by Hill and Adamson in Edinburgh. In a November 1843 letter (and therefore before the publication of the first notebook of *The Pencil of Nature*), his friend David Brewster anticipated this:

> I would like to be able to send you some of the magnificent calotypes of ancient monuments in cemeteries as well as of the modern monuments taken by Mr. Adamson, and also copies of the magnificent groups of *picturesque* personages that he and Mr. Hill have organised and photographed. Those of the fishermen and women of Newhaven are particularly extraordinary.

And as if he was answering his friend, Talbot wrote the following in *The Pencil of Nature*:

> I have observed that family groups are special favourites [to obtain good portraits on calotypes]: and the same five or six individuals may be combined in so many varying attitudes, as to give much interest and a great air of reality to a series of such pictures. What would not be the value to our English Nobility of such a record of their ancestors who lived a century ago? On how small a portion of their family picture galleries can they really rely with confidence![47]

As stated at the end of this comment of Talbot's, it is remarkable to observe the difference between the human *types* that interested David Brewster, from among the calotypes taken by D. O. Hill —the fishermen, their wives— and those that appear to interest Talbot in this note: the British aristocracy. The former favours popular types, men and women from the most common trades portrayed in all their *picturesque* splendour. The latter, men and women refined through their education and comfortable life. We may think that the taste for portraits of popular *types and costumes* that was soon to follow would have had more to do with Brewster's inclination than with that of Talbot. And to a degree all the greater the more the calotype was associated with travels and places far distant from European civilisation: Athens, Jerusalem, Egypt, the Alhambra. Both human types came together in these places, but some were behind the camera and the other *picturesque* ones in front of it.

These observations on Talbot's intentions and first productions allow us to glimpse on the horizon the presence of the *pictorialist* style in photography, even at its very inception. The art of painting reigned supreme in the visual arts. Its centuries-old achievements had transformed it into the unavoidable guest in the salons of monarchs, bishops, nobles and the moneyed bourgeoisie. Its artistic and social prestige explained the reach of its reign. So it was entirely understandable that the newborn art of photography should home in on it as a possible and desirable destination for its future development. Photographic art could emulate painting in virtually all of the genres it cultivated, no doubt about it. Even more, if photography restrainedly adhered to the use of its own means, it would be capable of obtaining images in keeping with those genres, with far greater artistic value than those produced by not a few landscape or portrait painters.

But photography's future technical development, and the dominance of its artistic results to which Talbot appealed in the first pages of his book, also invited us to imagine one further step: that photographic art could imitate not only genres but also, and above all, pictorial effects[48]. It was possible to think of how photography could be employed, it being a medium halfway between a scientific tool and the mechanical arts, to elevate it to the noble dignity of the arts, capable of attaining the beautiful and the sublime. Furthermore, romantic painting was already there to openly formulate the temptation.

> With the invention of dry plates and the perfecting of lenses and developing paper, Paul Strand observed, a framework of greater assurance and handling ease was established for all the stages of the photographic process, which contributed to speeding up the development of all of the medium's possible uses. And it was in this period between the late 1880s and the first years of the 20th century, when this curious misunderstanding started on the qualities inherent to the new medium among virtually all of those who were trying to express themselves through it. Without even guessing that with this machine a new and unique instrument had been placed in their hands, the photographers, practically without exception, were bent on using the camera as a shortcut for obtaining the results intrinsic to an accepted medium of expression, painting.
>
> We shall insist that it was the very photographers who rebelled against a process that, according to how they understood it, was used only for putting the external appearance of things on record. The expression "pictorialist photographer" then started to be used to distinguish between the pure creator of photographic records, obtained simply as documents of what they were seeing, and the man who was trying to use this new medium as a vehicle for his personal vision, to speak of life and the world, which were his own.

47. Talbot, 1844. Comments to Plate IV, *The Ladder*.

48. We already find indications in this regard in W. J. Newton, a painter invited by the recently created Photographic Society of London, who in this regard spoke as follows: "I do not conceive it to be necessary or *desirable* for an *artist* to represent or aim at the attainment of every minute detail, but to endeavour at producing a broad and general effect, by which means the *suggestions* which nature offers, as represented by the Camera, will assist this studies materially; and indeed, for this purpose, I do not consider it necessary that the whole of the subject should be what is called *in focus*; on the contrary, I have found in many instances that the object is better obtained by the whole subject being a little *out of focus*, thereby giving a greater breadth of effect, and consequently more *suggestive* of the true character of nature". W. J. Newton, "Upon Photography in an Artistic View, and its Relation to the Arts", *Journal of the Photographic Society*, no. 1 (1853), pp. 6-7. Reprinted in B. Newhall, 1980: 79. The italics are the author's. Vid. also Peter Henry Emerson, "Photography, A Pictorial Art", *The Amateur Photographer* no. 3 (March, 19, 1886), pp. 138-39. Reprinted in B. Newhall, 1980: 159-162.

But their rebellion, though understandable, was mistaken in employing photography as a shortcut to imitate the work of the painters they most admired. At each step they tried to turn the camera into a brush so that photographs would look like oils, etchings, charcoal drawings or anything else: everything except photographs. And, interestingly, they always imitated the work of inferior painters, with no other result than that of destroying the differentiating character and the expressive virtues specific to the new medium[49].

Physical and mechanical uncertainties confronting the photographer at every take

Being surrounded by such attractive imitative temptations, incipient photography found its natural mode of making its way as an independent medium for artistic expression. We have seen that this is what occurred with the portraiture of Hill and Adamson, in Edinburgh. And in Paris, photography amateurs such as Le Gray or De Molard abandoned the national daguerreotype to work with increasing success on their calotypes of the landscape and portrait genre.

So in regard to the beginnings of photography as an artistic medium independent of all preceding ones, the inventors of photography had much to say, and said it. To the chemical principles of the new inventions; and to the principles of perception, imagination and intellection of the photographic images, those pioneers added those corresponding to the artistic production of photography. We now come to the third leg of the photographic action, the one from which it issues and which sustains it, between nature and the spectator: the photographic image.

The first thing that strikes one is the frequency and assurance with which Talbot discussed "the Photography"[50] as an *art*. He could have denominated it "technique", "requirement", photographic "manipulation", but habitually and consistently prefers to consider it as an *art*. "The Photographic Art"[51], "The art of photography"[52], "a new Art"[53], "the new art of Photogenic Drawing"[54], "Art of so great singularity, which employs processes entirely new, and having no analogy to anything in use before"[55]: these and other similar ones are the expressions Talbot employs from 1839 onwards to refer to what his discovery is capable of producing. He had decided to christen his invention with a neologism created from the Greek: "calotype", which literally means "beautiful drawing" (*kalos-typo*). And hoped that the results obtained would be appreciated as meriting such a name, no matter that initially he did not appear to be sure of how to attain that honour[56]. But it so happens that daguerreotypes were following the same path as calotypes: once Daguerre's achievements were known, Talbot could explain to himself their immediate, enthusiastic and worldwide acceptance for a single, fundamental and simple reason: their beauty[57].

Talbot was not an artist in the conventional meaning of the term. He confessed himself incapable of drawing: "the knowledge of drawing, which unfortunately I did not possess". It is surely this that gave rise to his inclination to consider his invention a sort of *Drawing*[58], though one made by a hand other than his own and of his invention's operator. But there was no doubt about its results: they were those of an *art*. The "principles and practice" of which he had been the fortunate first discoverer were thus necessarily those of an artist.

However, if Talbot had placed so much emphasis on saying that it is Nature who draws and smudges on the calotype, without intervention of the human hand, what would being an artist consist of, apropos photography? Is it perhaps a question of supplanting nature, occupying —as Picasso would say against Diderot— its hegemonic place? This is not what Talbot thinks. Was it then a question of manipulating nature? But that fact is

49. Also Newhall, 1980: 9.

50. Talbot, 1841 [1980: 33]. Talbot, 1844. Introductory Remarks. Comments to plate VI (Leaf of a Plant), plate VIII (A Scene in a Library), plate IV (The Ladder).

51. Talbot, 1844. Brief Historical Sketch of the Invention of the Art. Comments to plate V. Bust of Patroclus. Plate IX. Facsimile of an Old Printed Page. Plate X, The Haystack. Plate XX. Lace. Plate XXIII. Hagar in The Desert.

52. Talbot, 1844, Brief Historical Sketch of the Invention of the Art.

53. Talbot, 1844. Brief Historical Sketch of the Invention of the Art. Comments to plate VI. The Open Door.

54. Talbot, 1839 [1980: 23, 30]. Talbot, 1841 [1980: 33]. Talbot, 1844. Introductory Remarks. Comments to plate XV, Lacock Abbey in Wiltshire.

55. Talbot, 1844. Introductory Remarks.

56. "This remarkable phenomenon [the solar action upon the paper, becoming afterwards insensible to it thanks to the preserving process], of whatever value it may turn out in its application to the arts". Talbot, 1839 [1980: 25]

57. "This great and sudden celebrity was due to two causes: first, to the beauty of the discovery itself".
Talbot, 1844. Brief historical sketch of the Invention of the Art.

58. Talbot, 1841. 1844, comments to plate XV, Lacock Abbey in Wiltshire; and to plate XVII, Bust of Patroclus.

that she does not allow herself to be manipulated —nature is more powerful than we are, also for Picasso ("Painting is stronger than I"). So what does the photographer do to deserve the title of artist, when he cooperates with the main author of photography, namely nature?

There is an initial unequivocal aspect, for Talbot and for anyone who has practiced photography, which is the need to prepare every shot. Photography does not occur on its own, nor by spontaneous generation. The photographer has to make numerous emotional operations of calculation, imagination, emotion and decision before allowing the light to act. And together with these *mental* operations there are as many *mechanical* ones: travel, manoeuvres, adjustments, which again need to be done minute by minute, second by second, before shooting. For those who undertake it, the photographic action is a lengthy mental and motor process in which it is not the same thing to start to take a photograph and having taken it. It involves a *poiesis* of continuous uninterrupted extension: if not over time (it may in effect involve pauses), certainly in the intention, in the searches, in the calculations of the undetermined, in the displacements, in the continuous decisions required to materialise one's own expressive intentions.

To begin with, the photographer has to choose his photographic *theme*, that is to say, one he considers worthy of existing photographically. This is not a matter of scientific applications of photography for, let's say, botanical illustration. In these cases the photographic theme is decided beforehand by the scientist, and the illustrator is his humble servant. The artist's case is very different, even contrary, for nothing and no one forces him to choose one theme over another. Even less so in the case of nascent photography, when there was no Royal Academy of Fine Arts seeking to impose conventions, themes, norms, as occurred in nineteenth-century painting. The choice of photographic theme fell entirely to the photographer. His reasons for choosing one or another are entirely personal, subjective, idiosyncratic.

Having once decided what he wishes to photograph, he will have to travel to the appropriate place. This travel can lead him to the garden of his home, or to the pyramids in Egypt. To obtain calotypes of Orléans and Paris, Talbot had to travel from Lacock to these cities, carrying his heavy and delicate technical equipment.

Once there, from the unlimited spots available to him, he will have to choose one, and only one, in which to install his camera. In this, what Talbot denominates *views*[59] is decisive: vistas or perspectives of a body (building, bridge, boulevard, a sculpture in the round) immobile in a space. The possibilities of looking at any singular and concrete photographic theme are unlimited. Each variation in the camera's position produces a variation in the *view*. If for example this is Christchurch College, a front *view*, a lateral *view,* a high-angle *view.* There are as many possible calotypes of a single body as there are positions from which to observe it, but the photographer has to choose a single one, for the photographs are taken one by one. It may of course happen that this broad spectrum of possible *views,* all of them good, makes him think of a *series* of calotypes (*series of views*, *of pictures,* in Talbot's original[60]) of the same building, the same city, or the same geography or landscape.

Commenting on the action he performed to obtain the first of the calotypes in his book, in Oxford, Talbot notes: "The view is taken from the other side of the High Street—looking North". And on the second one, taken in Paris, he points out: "Taken from one of the upper windows of the Hotel de Douvres, situated at the corner of the Rue de la Paix". Taking a photograph in those cities and not others, in those streets and not others, from that hotel, from that floor and from that window and not others, all of it is the result of decisions that Talbot and only Talbot could take. This is also the case, even if it so happened that, travelling to Paris for other reasons, he lodged in precisely that hotel and his room was precisely on that floor; for having arrived there carrying his photographic gear, and having taken the decision that the view it offered him from that spot was the right one for taking a calotype, only he could take those and other decisions.

There is no more than one calotype of the city of Paris in Talbot's book. But of Oxford and Lacock he offers a *series* of calotypes (four of the former, three of the latter). He also offers as a *series* some of the bodies photographed in interior spaces: the two variations of the bust of Patroclus and the three of objects on shelves (china, bottles, books). Of the individual members of each one of these series he can say that they are a *part* (*Part* of Queen's College, Oxford) of that photographable whole in front of which, or in the midst of which, stands the photographer.

59. Talbot, 1844. Comment to plate XII. The Bridge of Orleans. Plate XIII. Queen's College, Oxford. Plate XV, Lacock Abbey in Wiltshire. Plate XVII. Bust of Patroclus.

60. Talbot, 1844. Comment to plate XIV. The Ladder. Plate XV. Lacock Abbey in Wiltshire. In his 1839 paper [1980: 28], Talbot considered the possibility of installing several cameras in different positions around the body (building, monument, etc.) that the painter or draughtsman has set out to imitate, in such a way that those "collective results, when examined afterwards, may furnish him with a large body of interesting memorials, and with numerous details which he had not had himself time either to note down or to delineate".

But the areas of indeterminacy which the photographer needs to address and decide on before shooting are not yet at an end. At the same time as choosing the photographic theme and deliberating on which will be the most appropriate perspectives or vistas for doing the shot, he has to take into account the action of the main actor, light. To start with, he has to decide at which time of day he wants to place himself *on the spot* to find there, or to be able to find, the light he deems to be the best for his theme. Talbot knows from experience how difficult it is to work in a country such as his, governed by a climate so variable that it produces constant mutations in the quality of the light.

> Each picture is separately formed by the light of the sun, and in our climate the strength of the sun's rays is exceedingly variable even in serene weather. When clouds intervene, a longer time is of course allowed for the impression of a picture, but it is not possible to reduce this to a matter of strict and accurate calculation.

The decision on the most appropriate light for each photographic take is again personal. In the comments to the two first plates in his book, Talbot specifies the time of day when they were shot (and therefore with which light and which shadows). "The time is morning", he notes under the first one. And under the second one: "The time is the afternoon. The sun is just quitting the range of buildings adorned with columns: its façade is already in the shade, but a single shutter standing open projects far enough forward to catch a gleam of sunshine".

On other occasions, the photographer's dealings with light will consist not in counting on it but instead in avoiding it.

> The sunshine causes such strong shadows as sometimes to confuse the subject. To prevent this, it is a good plan to hold a white cloth on one side of the statue at a little distance to reflect back the sun's rays and cause a faint illumination of the parts which would otherwise be lost in shadow.

Talbot mentions yet another two possible spheres of action for the camera's operator[61] before shooting: one is whether or not to move the photographic subject in relation to the direction of the light it receives; another is whether to move the camera away or towards it.

> Statues, busts, and other specimens of sculpture, are generally well represented by the Photographic Art; and also very rapidly, in consequence of their whiteness. These delineations are susceptible of an almost unlimited variety: since in the first place, a statue may be placed in any position with regard to the sun, either directly opposite to it, or at any angle: the directness or obliquity of the illumination causing of course an immense difference in the effect. And when a choice has been made of the direction in which the sun's rays shall fall, the statue may be then turned round on its pedestal, which produces a second set of variations no less considerable than the first. And when to this is added the change of size which is produced in the image by bringing the Camera Obscura nearer to the statue or removing it further off, it becomes evident how very great a number of different effects may be obtained from a single specimen of sculpture.

Through these manoeuvres the photographic operator chooses and ensures what today we would call *the framing* for each one of his calotypes. Talbot does not mention it explicitly nor makes any reference to background, nor to the space around the body chosen as photographic theme and subordinate to it. These notions, which will gradually develop as the photographic medium matures, indicate crucial operations on which the photographer needs to deliberate and come to a conclusion. For the calotypes of the first close-ups reproduced in *The Pencil of Nature*, Talbot has chosen dark backdrops, free of pattern, as required by the principal theme (shelves with much white china, or books, or the pristine crochet filigree). For the still life calotype he does appear to have taken the trouble to choose a tablecloth whose pattern (striped) and texture provide an enriching contrast to the round, smooth and glossy volumes of the fruits he is about to photograph. And again in the urban landscape of the Paris boulevards, Talbot appears to be very much aware —as he mentions in his text— of the height of the horizon in this view, and of how, despite their distance from the camera, the rows of chimneys of the houses stand out and how characteristic they are of the city he is portraying.

Talbot has taken all this into account, he has deliberated over it and addressed it in taking each one of the calotypes he will then feature in his book. But he cannot yet shoot, he still has to consider which is the technically most appropriate negative for the theme, the perspective, the light and the proximity or distance of the body or bodies he has set out to photograph. He could have negatives on paper of differing size prepared and ready beforehand, but he would have to deliberately choose the most appropriate size for the proposed theme, and spread more or less photosensitive solution on it depending on the exposure time he had calculated. In the

61. Talbot, 1841. 1844, Comment to plate XIII.

daguerreotype this was even more complicated, for it required a lengthy chain of prior manipulations: choice of negative's size, polishing and cleaning of the silver-coated copper plate, sensitising the plate with iodine, now set in its rear box; focusing by sliding this box inwards or outwards, etc.

With everything decided and arranged, the moment came to expose the photosensitive surface to the light reflected on the surfaces of the bodies in front of the camera. The calotype's reaction could last several seconds or several minutes, depending on the intensity of the light[62]. That of the daguerreotype even longer, for initially it required around ten minutes' exposure (making it useless for portraits), although it could be reduced to approximately one minute thanks to improvements in the lenses[63]. And for however long the exposure lasted, the situation was governed by three main players, none of which was human: an active one, the light; a passive one, the photosensitive substance; and a third one, chance, a factor both active and imponderable. Because whatever occurred between the light source and the photosensitive paper or plate could have a negative or a positive effect on the final result. A change in the light, a bird settling between the camera and the photographed body, could spoil the business for good. But also in reverse: during that time some fortunate events might occur, a touch of grace that the photographer might not have calculated beforehand and that enhanced the beauty or interest of the resulting calotype.

> It frequently happens, moreover—and this is one of the *charms of photography*— that the operator himself discovers on examination, perhaps long afterwards, that he has depicted many things he had no notion of at the time. Sometimes inscriptions and dates are found upon the buildings, or printed placards most irrelevant, are discovered upon their walls: sometimes a distant dial-plate is seen, and upon it—unconsciously recorded—the hour of the day at which the view was taken[64].

These accidents (in the genuinely Aristotelian sense) can provide "an air of variety beyond expectation to the scene represented"[65]. Hence the accuracy of the dictum of the poet Agathon, which Aristotle recalled in one of his works: "art loves chance and chance loves art"[66]. Only that one needs to complete it by stating that chance itself, which sometimes loves art and builds it, other times destroys it, with a similar absence of reasons.

The mechanical processes of displacement, location, manoeuvring the gear, preparing the plates or papers and exposure, have reached their conclusion. The daguerreotype, which was directly a positive, is ready for viewing once dry. But the calotype is a negative, from which the corresponding positive can be obtained, also on paper[67]. And this is the photographer's last sphere of action, in his attempt to obtain the most beautiful calotypes from negatives. To begin with, it might be that the best thing would be to not obtain that positive if the negative obtained turned out to be the most beautiful of the possibilities. This is what Talbot decided apropos two calotypes inserted in his book: the piece of lace (plate 20) and a plant leaf (plate 7). Commenting on this one, he wrote: "The leaves of plants thus represented in white upon a dark background, make very pleasing pictures". Conversely, other photographed themes would be *unintelligible* if offered to the viewer as direct negatives, not turned into positives through a second copy.

> In taking views of buildings, statues, portraits, &c. it is necessary to obtain a *positive* image, because the negative images of such objects are *hardly intelligible*, substituting light for shade, and *vice versa*. But in copying such things as lace or leaves of plants, a negative image is perfectly allowable, black lace being as familiar to the eye as white lace, and the object being only to exhibit the pattern with accuracy[68].

Finally, if the photographer had decided to make that second copy, there was still one thing to resolve: the scale of reproduction he had to employ to obtain, from among all possible ones, *the most "delightful picture"*[69].

> All kinds of engravings may be copied by photographic means; and this application of the art is a very important

62. Talbot, 1839 [1980:25]. 1841.

63. Gaucheraud, 1839 [1980]: 17.

64. Talbot, 1844. Plate XIII, Queen's College, Oxford.

65. Talbot, 1844. Plate X, The Haystack.

66. Nicomachean Ethics, Z, 4, 1140 a 17-20.

67. Cf. Talbot, 1839 [1980: 30], where this procedure is already referred to, though without using the terms "positive" and "negative".

68. Talbot, 1844. Plate XXIV, Lace. The italics in *hardly intelligible* are not in the original. Same idea in Talbot, 1839 [1980: 30].

69. Talbot, 1844. Plate XIV. The Ladder.

one, not only as producing in general nearly facsimile copies, but because it enables us *at pleasure* to alter the scale, and to make the copies as much larger or smaller than the originals as we may desire[70].

We have reached the end of the calotype production process. It has been an open path to all destinations, assessed by the photographer to the best of his knowledge and chosen step by step, giving it the utmost attention. In Talbot's texts, we have several times come across terms such as *delightful pictures, pleasant copies, charming photographs*. We will now discuss those adjectives, crucial for ultimately understanding the photographic process as a true creative *iter*. If we did not have them, the photographer would present as an operator of a machine with effects calculable beforehand, like a mechanic, an engineer, but never an artist. The difference between them is that the artist has a guide, a star that guides him throughout this productive process, one that is open to the indeterminate and thus filled with anxieties. This guide is not reason, or not reason alone, but reason that stops when it comes up against emotion. Of course not any old emotion, but a textbook, foreseeable emotion. The only one that matters here is his, the artist's emotion —the emotion that moves him and moves other with the result of his work.

Rational enquiry stops when and if artistic emotion arises

It has been noted that Talbot did not consider himself an artist, a minor designation in any case when compared to the one he already held —inventor and disseminator of a heliographic reproduction method. Yet when reading *The Pencil of Nature* we sense that many artistic emotions were alive in him. They are latent, true, Talbot does not make a profession of them nor mention them expressly. Such reserve is revelatory of his individual character and perhaps of the idiosyncrasy of his nation's men. But the texts do speak of an author who has felt delicate emotions when working with calotypes, when selecting and publishing them to seek their dissemination. Thus, for example, when recalling his first (failed) attempts at drawing with the use of a camera obscura, he writes:

> I found that the faithless pencil had only left traces on the paper *melancholy* to behold.

Who could feel the *melancholy* of a sheet of paper, frustrated from serving the drawing so poorly, if not a delicate soul? The same one who in November 1838 made a calotype of a specimen of *Astrantia Major*, to which he gave this title: "Melancholy Gentleman" (Schaaf no. 2244). And also the same one who, to combat this melancholic dejection, enthusiastically imagines the opposite state:

> It was during these thoughts that the idea occurred to me… how *charming* it would be if it were possible to cause these natural images to imprint themselves durably, and remain fixed upon the paper!

And he achieved it: Talbot invited nature herself to draw on photosensitive paper, and nature confirmed that she wanted to and could do it satisfactorily. Talbot thus experimented with pleasures previously imagined apropos the drawings which the bodies would make of themselves on paper, they were real and, what is more, would turn into the photographer's habitual company:

> It *frequently* happens, moreover—and this is one of *the charms of photography*—that the operator himself discovers on examination, perhaps long afterwards, that he has depicted many things he had no notion of at the time.[71]

Talbot discussed it apropos one of the four calotypes taken in Oxford. It is manifest that the ancient university city produced profound inner emotions in him. Indirect proof of this is that he wanted to feature it up to four times in his book, like in a series. Direct proof, what he confesses in his comment to one of them (*Gate of Christchurch*, plate 18):

> Those who have visited Oxford and Cambridge in vacation time in the summer must have been struck with the silence and tranquillity which pervade those venerable abodes of learning. Those ancient courts and quadrangles and cloisters look so beautiful so tranquil and so solemn at the close of a summer's evening, that the spectator almost thinks he gazes upon a city of former ages, deserted, but not in ruins: abandoned by man, but spared by Time. No other cities in Great Britain awake feelings at all similar. In other towns you hear at all times the busy hum of passing crowds, intent on traffic or on pleasure —but Oxford in the summer season seems the dwelling of the Genius of Repose.

70. Talbot, 1844. Plate XI. Copy of a Lithographic Print. Also plate XXIII. Hagar in the Desert. The italics in *at pleasure* are not in the original.

71. Talbot, 1844. Plate XIII, The Queen's College, Oxford, Entrance. The italics are mine.

The text is charged with terms that denote Talbot's emotions. "In vacation" already indicates an exceptional season, one different from the ordinary ones of the normal academic year. With the "In the summer" that follows it, Talbot indicates the days of the most beautiful and constant light in England, the best ones for shaking off melancholic unease and a spur for photographic actions. "Silence and tranquillity" impregnate "those venerable abodes of learning", he says, *tranquillity* being a physical no less than an emotional state. But the photographer who feels *veneration* for these places understands that it is not only his imagination, a subjective state of his soul; he also perceives it as embodied in the *colleges* themselves, in the city's abbeys, in its monuments.

> Those ancient courts and quadrangles and cloisters look so beautiful so tranquil and so solemn at the close of a summer's evening...

The imagination of the viewer of these calotypes is invited to share Talbot's feeling, the mute emotion he feels before the solemnity of the university city at dusk on a beautiful English summer's day. But Talbot the photographer is in combat, so to speak, with the melancholic Talbot. For even though, as he writes, he is saddened by the absence of human vestiges in those Oxonian landscapes, at the same time he perceives there, with unusual intensity, something greater and more perfect that escapes the contingent course of a short human life: *Time*. Which perhaps amounts to saying: *Tradition*. No other city in the United Kingdom has the evocative powers in Talbot of Oxford and Cambridge —so states Talbot the essayist writing for his book. Cities can be admired for their incessant activity, those droves of zealous businessmen who endeavour to engage in international trade. But only those two ancient cities are home to the genie's magical lamp, he who will awaken in us a storm of ideas, emotions and feelings when merely caressing the polished surfaces of a calotype...

This is not the place, nor am I the right person, to discuss the emotional structure of Talbot's personality. Even so, his comments in *The Pencil of Nature* allow us to ascertain, at the very least, that he, too, was a son of his time. Talbot had done extensive tours around the continent, like Goethe, Byron or Gogol before him. He will have become imbued with the spirit of Romanticism, the *Geist* of his era. Only that this spirit that was incubated above all on the shores of the Mediterranean, in Italy, was to be awakened at home, when Talbot was in a deserted Oxford, in Cambridge, where he would feel and imagine and love his historic genie ("Time") as if he were imagining and feeling the indwelling spirit of the ruins of Pompeii.

The relevant point here is photography's suitability, ever since its seminal times, for embodying and transmitting the emotions awakened in the photographer by the views he sets out to photograph. The creator of the images may feel not only nostalgia but also surprise, admiration, dignity, contentedness, bewilderment, pride, sensual attraction, fear, rage... before the object at which his camera is pointing. And those emotions are as much a driving force for him as sunlight is for chemical emulsions.

We again have to resort to Aristotle to remember how the perception of any of the five senses is associated in living beings with their motor skills. According to Aristotle, given a need in the living being's body: lack of food, of drink, appropriate temperature, etc., this is manifested in his sensitive being as bodily pain or distress. And hunger, or thirst, or cold, or fear of danger, all set in motion the practical search for solutions: food, drink, shelter, flight. The same sensitive perception capable of discriminating the qualities of bodies now starts to search among them for those that have the right qualities to satisfy that which his deprived body requires. Unreasoning animals are moved by instinct; rational ones by instinct and reason. One drives them to look for the physical body that can relieve the organic pain or distress they are suffering. The other, as in humans, to also calculate what can best satisfy their needs, with how much work, at the expense of which other privations, given that his energy is limited and he has to use it with the maximum marginal usefulness in the orderly satisfying of his needs and cravings. Moreover, the needs that activate motor perception and skills in man are not only organic; it can also be said of other more spiritual needs inherent to his nature. He searches for an action, a person, a mood that will satisfy the hunger for contentment of a nostalgic soul; or a face that will confirm in him the dignity of man, of any man, even when surrounded by hundreds of dull gazes; or will calm the thirst for freedom in himself or in a people when threatened by power, social customs or human folly.

Whether instinctive or rational, the imagination is again at the fulcrum around which pivot our external, internal and motor sensibility and deliberative and discursive reason. A body pressed by physical need, one for which current perception does not present any bodies that may remedy it, will imagine which ones they will be and in which environment they will be found. The same with spiritual needs. If a city dweller cannot satisfy the yearning for knowledge or harmony that besets his soul, he will imagine a journey to Italy, to Greece or to Egypt —wherever he supposes that such a need will be met. And the more pressed by need, of one kind or another, the more vividly he will imagine what can satisfy it, where those bodies and those persons will be found, and in which direction he has to go to encounter them.

The photographer is a man, and when he works as a creator of images he cannot get out of his skin. He, too, is driven by desires, imaginations, calculations and apprehensions, precise or imprecise, in regard to what he is searching for and wants to photograph, and where he can find it. If his garden, the county woods, or the city or the country where he lives do not provide that answer, he will get going. Shouldering his photographic gear, he will travel to countries, cities, boulevards, hotels, apartments and room windows: wherever he senses that he can make an entirely satisfactory calotype.

Once there, between the camera's eye and unlimited nature, he will look for a point of balance, a *magical* reason where all the elements of the image can coalesce to best express the morphology of his desire, of his yearning. He knows from experience that there must be specific conditions of light, framing, angle, lights and shadows, and an exposure time for the subject he is proposing to photograph which best embody everything that moves him. Unlimited are the possibilities of obtaining an image of a single body, unlimited to the nth power those of capturing a city, a forest, a human group in a single image. The photographer explores them physically, imaginatively and intellectually, going over them when they are still only possibilities. Reason assists him in this process of search and calculation throughout the time, long or short, that the process lasts.

> The most transitory of things, a shadow, the proverbial emblem of all that is fleeting and momentary, may be fettered by the spells of our '*natural magic*,' and may be fixed for ever in the position which it seemed only destined for a single instant to occupy[72].

But given that the production possibilities are unlimited, this is also true of the apprehensions and calculations and machinations of reason, which assist the photographer in the photographic production process. This is why he has to set them a limit if he is going to activate the photographic shot. This limit is set by feeling, emotion, better than by reason. Emotion is closer to chance than reason, coexists better with it, and in the course of any human action —photographic included— it is impossible to displace it entirely. Now or never! says the photographer to himself when he determines to activate his camera. And why now? He can probably not offer very convincing reasons, he may not be able to rationally justify it, but he will be sure of what he is doing. As sure, at least, as a man can be in that situation, when all his power and even breath have been put into play to pursue his quarry. Perception, memory, imagination, desire, apprehension, reasoning... everything is active in the quest for attaining *kairós*, the appropriate moment for that single shot that will bring the prey down.

> A casual gleam of sunshine, or a shadow thrown across his path, a time- withered oak, or a moss-covered stone may awaken a train of thoughts and feelings, and picturesque imaginings.

The photographic camera is seductive, attracts to itself the men and women it needs in order to feel active and flattered. Firstly, it requires the action of the producer of images; then, that of the viewer who looks at them. The beginning and conclusion of photography is a comprehensive practice: perceptive, imaginative, intellectual, emotional, pleasurable, from start to end. Photography has occurred step by step, through the searches and conjectures and anxieties of the photographer; but once achieved, it is accepted and contemplated and enjoyed, all of it, in one go, whole, fulfilled. Photographic contemplation is lived by the viewer over a period in which he cannot distinguish the instant when it starts and the instant when it ends, for this occurs simultaneously in a unique and intense experience. One is happy, and has been happy, and continues to be happy looking at what nature, man and machine have been able to create together in a single photograph. The viewer knows himself to be part of exterior nature, which has responded so beautifully when courted by the machine; and also as part of the interior nature of the photographic creator, who is capable of making nature dance in order to give rise to the exceptional occurrence of artistic creation.

Once photography has successfully brought such disparate actors together, photographic viewing creates a community of humans who pursue and attain the same end, and an excellent one at that. They have come together in a kind of magical assembly where the optimal, which was thought to be impossible, has been made real through the action of nature, or chance, or God knows by whose hand. We have here the natural action of the light, of optics and of chemistry, plus the mechanics of the photographic device. We have human nature, which moves perception, desires, imagination, yearnings, apprehensions and the movement to achieve what it sets out to do. Or one that, transformed into experience, looks out of a man's face, of the face of a worthy, or tormented, woman. Everything in photography speaks to us of inexorable

72. Talbot, 1839 [1980: 25]. The italics are Talbot's.

natural actions and of the deliberate actions of a producer of images; his manoeuvres, his perceptions, his free or compulsive decisions, his struggle against chance and with the preposterous wish for the impossible to happen.

For this to be fully achieved, there is only one condition: for the photograph to say it without words. The artistic image should not need complementary discourses. The image is not the word, nor does it need it: it communicates by itself thanks to the analogy it bears with the surfaces of the bodies that have caused it. It is not a symbol of reality but its index. This is why viewing the image does not consist of and is not resolved with enunciative speech. It offers itself as what it is, never in any other way. Certainly not with a discourse that explains it, with a linguistic description of its contents, with the tale of the particular circumstances of its production... If the photographic path has led to some kind of artistic destination, the image will tell it; but if it has fallen by the wayside, or if it missed the mark, or was marred, nothing will remedy it. Discourses on image will be offered as maps of geographies that have never existed. No tale, chronicle, certificate or reasoning will replace undergoing the aesthetic experience of viewing the image unless it provides it.

At this point one can sense the doubts Talbot may have harboured apropos the artistic reach of the images he had created and offered in *The Pencil of Nature*. That he had decided to accompany his calotypes with texts was justified when he did not set out to feature in them the artistic character of the corresponding calotype. He did this, for example, when he wanted to comment on issues of procedure: how a negative calotype is obtained and how it is turned into a positive, how is an image by contact obtained, etc. The explanation of a calotype's different applications also required a text: preserving valuable drawings or documents, bringing to the wider public the artworks conserved in museums of other nations... None of these purposes was strictly artistic, so it is understandable that Talbot should articulate a discourse to explain them and make them manifest to readers who were mostly unfamiliar with the wealth of the photographic medium.

But if the calotypes taken by Talbot in Oxford did not convey what he himself perceived, felt and devised in those same scenarios, at highly precise times of the day, and needed an explanatory text... then something in them was not working as it should. One looks at the calotype of the *Martyrs' Memorial* in Oxford (plate 21) and it is possible that, in view of the coldness or lack of emotion that comes over one, the following clarification by its author may be appreciated:

> Oxford has at length, after the lapse of three centuries, raised a worthy monument to her martyred bishops, who died for the Protestant cause in Queen Mary's reign. And we have endeavoured in this plate to represent it worthily. How far we have succeeded must be left to the judgment of the gentle Reader.

Something similar may happen to us when viewing the ancient city of Orléans, reproduced in plate 12. Talbot has chosen to take it from the left bank of the wide river that flows through it, the side furthest from its town centre.

> This view is taken from the southern bank of the river Loire, which passes Orléans in a *noble* stream. A city rich in *historical recollections*, but at present chiefly interesting for its *fine* Cathedral.

How much of looking at this river, immobile in the calotype, can arouse in us the feeling of its *noble stream*... how many of the *historical recollections*, awakened in Talbot's imagination when enjoying this view, are awakened in us, the calotype's viewers, or remain dormant... If the image of the slender tower of the Cathedral, dominating the photographic composition, does not impose itself on our imagination and sensibility for itself, it will not do so either, or very little, by the image's footnote on its fine outline...

I do not propose to critique the calotypes chosen by Talbot for *The Pencil of Nature*. Many will surely defend its artistic value, especially Britons, who are more aware of the geography and history of those places. Nor do I propose to critique those other calotypes that, for me, do manifest Talbot's original, unique, artistic vision on the bodies he photographs. For me, the calotypes of leaves and plants, the busts of Patroclus, or the image of the lace count as artistic images. But it is interesting to note that, for those images that appear to speak for themselves, Talbot does not require any additional discourses. The comments he makes in the footnotes to these calotypes are not on the images themselves, for they do not need them. Talbot uses such occasions to speak of practical matters, procedures and applications of photography in general... because those particular images featuring such explanations speak for themselves. They confirm that Talbot the inventor had artistic vision and knew how to assert it through the photographic medium[73] like he never could do through drawing.

The practice of and reflection on the photographic medium would prove Talbot right shortly thereafter. In his

73. Cf. Schaaf, 2000: 6.

"The Art of Photography" (1859), the British photographer who first toured Egypt, Nubia and Palestine with his camera distinguished several levels of possible uses for photography, to which would correspond as many intentions of the photographer's. There were three of them: Mechanical Photography, Art-Photography, High-Art Photography.

> MECHANICAL PHOTOGRAPHY will include all kinds of pictures which aim at a simple representation of the objects to which the camera is pointed, and will include not only all reproductions but the great majority of portraits and landscapes. [...] ART-PHOTOGRAPHY will embrace all pictures where the artist, not content with taking things as they may naturally occur, determines to infuse his mind into them by arranging, modifying, or otherwise disposing them, so that they may appear in a more appropriate or beautiful manner than they would have been without such interference. This class may easily embrace almost all subjects. In landscapes the artist may select the period of the year, the condition of weather, time of the day, point of sight, length of exposure, &c., as material agencies in beautifying his picture; the same in portraiture, by arrangement of light, *pose*, expression, presence or absence of accessories, &c., also in the composition of pictures by the due attention to all the necessary parts, so as to form one harmonious whole. HIGH-ART PHOTOGRAPHY —This distinction may appear presumptuous; but I feel a necessity for it to include certain pictures which aim at higher purposes than the majority of art-photographers, and whose aim is not merely to amuse, but to instruct, purify, and ennoble[74].

Commercial use of photography. Photographic industry

There are still a couple of aspects to comment on before bringing these notes to an end. One refers to the immediate dissemination enjoyed by the calotype and the daguerreotype among those who understood (chemists, ahead of any other trade) the lucrative possibilities of the new inventions. The other one is the immediate and increasingly democratic use to which the camera lent itself as the traveller's inseparable companion.

Louis-Jacques-Mandé Daguerre, in a letter to Aragó (1839), wrote: "I will always be glad that my discovery should contribute to *usefulness* and to the public's enjoyment, and I do everything in my power to make it so". And he spoke the truth. Talbot, too, (1841, 1844) referred to the numerous *applications*[75] of his invention. By this term he meant the uses for the calotype other than the purely artistic ones —or, in other words, its various utilities. Thus, for example, he showed the calotype's usefulness in the conservation of valuable originals such as manuscripts (plate 11), drawings (plate 23), or sculptures in the round (plates 5 and 17)[76]. Those calotypes included in *The Pencil of Nature* could be considered *specimens* (*specimen*[77], *example*[78]), namely, a particular case of one of the kind of general applications of the calotype. Of these there could be many, unlimited particular examples. Also patently clear was the *application* of photographic art to cataloguing objects, e.g. in a collection, as he pointed out in his comment to the calotype of china items and to the one of glass bottles (plates 3 and 4). Those calotypes were even more useful in that the photographic capture of that multitude of bodies was unique and simultaneous and did not require a greater exposure time than would have been required for copying just one of them —a huge difference in regard to the time that describing in words each one of those objects would require. And he considered the calotypes to be veritable *facsimiles*[79] of his originals, to such an extent that he even hinted at the possibility of using them as means of proof in a trial[80].

The calotype could also have enormous interest as a medium to illustrate historical science —at least for a local and familiar history. This is what he implied in the chronicles that accompany plates 15 and 19 of the monumental 13th-century Abbey he saw every time he opened the window of his room. In this case, the text is perhaps closer to literature than to historical science; but we must not forget the success of the historical novel in Britain thanks to the genius of Sir Walter Scott, who was only a little older than Talbot (and of whose

74. F. Frith,, 1859 [1980: 115].

75. Talbot, 1839 [1980: 24, 25, 26, 28]. Talbot, 1844. Plate IX, Facsimile of an Old Printed Page. Plate XI. Copy of a Lithographic Print (2 times). Plate XXIII (Hagar in the Desert).

76. Possibility already mentioned in his 1839 paper [1980: 28].

77. Talbot, 1844, Introductory Remarks. Plate III (Articles of China). Plate V (Bust of Patroclus). Plate VII. Leaf of a Plant. Plate XXIII (Hagar in the Desert).

78. Talbot, 1844. Plate XX (Lace).

79. Talbot, 1839 [1980: 28]. Talbot, 1844. Comment to plate XI. Copy of a Lithographic Print. Plate XXIII. Hagar in the Desert.

80. Talbot, 1844. Plate III, Articles of China.

tomb, incidentally, he proposed to obtain a calotype [Schaaf, no. 2801]).

Another extraordinary use for daguerreotypes and calotypes was their application to portraiture. We already mentioned the practical difficulties of working this genre, relating above all to the need for the sitter's immobility and the variations of sunlight during exposure. But the operators of daguerreotypes and calotypes discovered how to control these variables to obtain images that competed on an equal footing with the best results of portrait painting. The above-mentioned Draper (1840), experimenting "On the Process of Daguerreotype, and its application to taking Portraits from Life", concluded in astonishment: "the eyes are reproduced perfectly [in the daguerreotype]: the iris is sharply outlined and the white spot of light above it has such power and truth and life that it surprises those who have never seen it before. Many are convinced that to provide the final touch a painter's pen has secretly been employed". And Talbot knew very well that in this the calotype was not far behind the daguerreotype (1841, 1844). So much so that he was promptly informed of the good results obtained by Hill and Adamson in Scotland, as we already know.

So it is not surprising that, from among those who soon gained control over the chemical and mechanical procedures of one and the other heliographic procedure, many understood the lucrative opportunities offered by the taking of portraits while posing in a studio. In France the patent belonged to the State, so that whoever wanted to used it could do so without paying royalties to its inventor. But the patents system was different in Britain and Talbot had to apply for a patent for his invention. The patent for the "photographic images" obtained according to Talbot's method was registered in March 1841 (Scotland was left out of it). The legal limitations did not include the scientific use of the calotype, nor what amateurs could do with it. What was stipulated was the canon that Talbot could negotiate with the professional photographers who wanted to make lucrative use of his procedure. "You are quite right in patentizing the calotype —wrote Herschel to his friend Talbot a few days after the latter had patented his invention; and with the *liberal interpretation* [in reference to free access for scientists and amateurs] you propose in exercising the patent right no one can complain. And I must say I never heard of a more promising subject for a *lucrative* patent of which I heartily give you joy. I see a Mr. Wolcott has taken out a patent for photographic portraits in 25^{sec} by a *reflecting apparatus* [the Wolcott machine]. He has opened rooms at the Polytechnic Institution Regent Street. I do not know the nature of his process. Probably some travestie or piracy of Daguerre's".

This was the start of the competition among the different professional photographers to buy from Talbot the exclusive right to exploit his patent in a specific location in the United Kingdom. H. W. Treffry requested it for London, in a letter to Talbot dated 30 August 1842; but they did not reach an agreement. Antoine François Jean Claudet, a Frenchman settled in London to exploit Daguerre's patent in that city, requested it from Talbot (letter of October 1842) when relations with his French partner broke down. Talbot wanted 1/3 of the photographer's gross proceeds, which Claudet thought excessive. The final agreement established an annual payment of 10,000 francs to the patent's owner, Talbot. For her part Amélina Petit de Billier, a friend of the Talbot family, made arrangements on behalf of the caricaturist, lithographer and journalist Charles Philipon, to obtain the corresponding exploitation licence in the French capital. The canon demanded by Talbot was 5,000 francs per annum. They did not reach an agreement.

But some French amateur photographers (De Molard, Le Gray, Blanquart- Évrard, among others), who had switched from the national daguerreotype to the British calotype, started to touch up the processes registered by Talbot to obtain their own artistic effects and in the process avoid the restrictions of the English patent. This gave rise to a series of disputes and renewal of patents, which Talbot registered in 1843, 1849 and 1851. After the invention of the wet-collodion process made public by its inventor, Frederick Scott Archer[81], in 1851, the legal situation became even more complicated, for this procedure had definitively moved away from the one registered by Talbot. "Le future c'est le papier", prophesied Le Gray. Yet he and some of the other French calotypists had so far developed the photosensitivity and washing techniques of such paper, discovered by Talbot, that they could bypass the British patent and create their own. A decade after its birth, the calotype inexorably displaced the daguerreotype, proving Le Gray right; but Talbot no longer controlled the technical evolution of his invention, neither legally nor financially. Amateur photographers became professional photographers and gave rise to what Baudelaire, as far back as 1855, had denominated *l'industrie photographique*.

Photography and tourisme. Travel by the nobility and the middle class

The calotype was born of chemistry, of optics... and of travel.

A year after having graduated in mathematical sciences from Trinity College, Cambridge, in 1821, Talbot became a

81. F. Scott Archer, "The Use of Collodion in Photography", The Chemist, no. 2 (March 1951), pp. 257-58. Reprinted in B. Newhall (ed.), 1980: 51-52.

member of the Royal Astronomical Society. Half a dozen papers on elliptic integrals and the physics of light earned him his membership as a Fellow of the Royal Society, in 1831. In late 1839 the number of his publications added up to four monographs and twenty-seven scientific collaborations[82]. But he was also a member of a stately family boasting a title of nobility and a well-managed and highly productive property in Lacock Abbey (Wiltshire). These conditions allowed Talbot to often devote himself to one of his favourite occupations, travelling around Europe. His most treasured destination was Italy. It so happened that Talbot had been free of occupations for almost a whole year, between 1833 and 1834, to take, in the company of his wife Constance Mundy of Markeaton, what used to be called a "continental tour". On that occasion the tour would take them to France, Switzerland and Italy. And it was on that last stage of the trip, "wandering in classic Italy", when he found himself, for the first time, thinking of the possibility of photography.

If, as Tucker points out (2005: 18), Talbot "was a gentleman collector of natural wonders and artificial curiosities" (vid. his 1839[83] paper and his comments to plate 8, A Scene in a Library), it is understandable that one of his favourite occupations during these trips should be drawing. He did it with the help of a *Camera Obscura* given that, as we know, he was not very skilled with a pencil. But his frustration during that journey was growing, for not even with the help of such a camera was he successful in approximating his drawings to the sublime ruins before his eyes. And so he found himself wrapped in the reveries of a solitary wanderer, like Rousseau on the shores of Lake Geneva but on those of Lago di Como, when for the first time the inventor daydreamed about photography.

> How charming it would be if it were possible to cause these natural images to imprint themselves durably, and remain fixed upon the paper! And why should it not be possible?", I asked myself[84].

The Talbot spouses happily concluded their trip and the scientist returned to England, to his ordinary political tasks as a member of the House of Lords (he had been elected for the Chippenham, Wiltshire constituency in 1832). But in the spring he was able to return to his residence in the countryside, at Lacock Abbey; and now installed in his manor, he started to experiment, with all the rigour of the Baconian method (as he presented it in his 1839[85] paper and in his 1844[86] book), on the basis of the idea that "occurred to me amid floating philosophic visions"[87].

The second decisive input for the progress of his invention occurred soon after, and again abroad, "during a residence at Geneva in the autumn of 1834"[88]. This produced a chance encounter with the baronet Sir Humphry Davy, a prominent member of the Royal Society thanks to his electrochemical research previously mentioned here; giving him the opportunity of explaining how silver iodide had, in his experiments, turned out to be considerably more sensitive to light than the chloride of the same substance —a conclusion which Talbot was unable to replicate in his own experiments upon his return to Lacock Abbey, for these led him rather to the opposite conclusion[89].

The synthesis of experiences in his own home and abroad allowed Talbot to happily come up with the natural drawing method on photosensitive paper. And when he wanted to give an account of it before the Royal Society, in 1839, he did not fail to mention one of the most convenient and accessible applications of his invention: as an aid for travellers who, like him, were unable to record with their pencil the marvels they were visiting.

> I thing that the art has now reached a point which is likely to make it extensively useful. How many travellers are almost ignorant of drawing, and either attempt nothing, or bring home rude unintelligible sketches! They may now fill their portfolios with accurate views, without much expenditure of time or trouble; and even the accomplished artist will call in sometimes this auxiliary aid, when pressed for time in sket-

82. Schaaf, 2020: 11.

83. "The phenomenon which I have now briefly mentioned [the *preserving process* of the image] appears to me to partake of the character of the *marvellous*, almost as much as any fact which physical investigation has yet brought to our knowledge". Talbot, 1839 [1980: 25]. The italics are Talbot's.

84. Talbot, 1844. Introductory Remarks. Also Talbot, 1839 [1980: 28].

85. Talbot, 1839 [1980: 25]

86. Talbot, 1844. Introductory Remarks.

87. Talbot, 1844, Introductory Remarks.

88. Talbot, 1844. Introductory Remarks.

89. Talbot, 1839 [1980: 27, footnote].

ching a building or a landscape, or when wearied with the multiplicity of its minute details[90].

Talbot was not wrong on this either. Before the calotype had spread among professional studio photographers in the 1850s, it had quickly been disseminated among the members of Talbot's social class. They were the ones who could use it as amateurs, not for lucrative interest like the professionals but for the pleasure of being acquainted with it, mastering it and making use of it at any time in their lives. "The men and women who pioneered photography in the 1840s —wrote Tucker (2005: 19)— were genteel amateurs in the broadest sense of the word. This was partly because the expense of equipment and supplies prohibited most people from participating in the formative years. Photography thus developed in the informal, convivial networks that assembled around the empirical study and drawing of the natural world in genteel circles".

We now understand why Talbot had included among the calotypes featured in *The Pencil of Nature* those collections of china articles, glass bottles and fine lace: because he had them in his home, or some Lord friend of his had them in his. It also explains why he included a calotype of Paris in the same book, for he could have taken it on one of his continental tours. It explains, in short, that when analysing the applications of the calotype to portraiture, Talbot first thought of portrait galleries in the manors of his friends and acquaintances, most of whom were aristocrats like himself.

> What would not be the value to our English Nobility of such a record of their ancestors who lived a century ago? On how small a portion of their family picture galleries can they really rely with confidence![91]

Something different was happening in France with photography trips. To start with, Daguerre, who was a painter of theatre sets and manager of his diorama show, was tied down by his work in Paris. Daguerre could not travel as much as Talbot did, neither by habit nor by socioeconomic position. And as possible scenarios for his daguerreotypes, the sites of Paris were more than enough (proof of this was the calotype published by Talbot, and even more so the future work of Eugène Atget). It is true that Gaucheraud, in his chronicle of Daguerre's invention published in *La Gazette de France* on 6 January 1839, already announced the delights that *les touristes* would obtain from the new device: "Travelers, you will soon be able, perhaps, at the cost of some hundred of francs, to acquire the apparatus invented by M. Daguerre, and you will be able to bring back to France the most beautiful monuments, the most beautiful scenes of the whole world"[92].

But this did not turn out to be so easy. To begin with, the heavy equipment (around fifty kilos) that had to be carried to wherever the shot was going to be taken, made the daguerreotype unsuitable for extensive travel. However, as far back as 1840 an amateur daguerreotypist, the Frenchman Noël-Marie Paymal Lerebours, conceived the idea of sending operators around the world to take calotypes and obtain from them... engravings. *Excursions Daguerriennes, Collection de 50 Planches, Représentant les vues et les monuments les plus remarquables du globe: Paris, Milan, Venise, Florence, Rome, Naples, La Suisse, L'Allemagne, Londres, Malte, L'Égypte, Damas, Saint-Jean-D'Acre, Constantinople, Athènes, etc.* was the complete title printed on the advertising brochure of the subscription. The service rendered by the daguerreotype's exactness and precision to the art of engraving was undeniable, and express mention was made of it in this publicity. But this was obviously not the way to show the supremacy of the photographic medium in artistic expression and in the various uses that could be made of it while respecting its autonomy.

The calotype gear was far simpler and lighter than that of the daguerreotype. In addition, the photosensitive papers could be prepared in advance and were considerably more convenient and simple to carry than the glasses and bottles with the components of Daguerre's emulsion. On photography trips, the calotype was clearly more advantageous than the daguerreotype. Talbot understood this from the very first minute of publishing his method[93]. Yet interestingly the calotype was not immediately associated with continental or Mediterranean trips, as had long been the settled custom among the British nobility. Lord Byron, for example, had done

90. Also Idem, 1844, Plate XVII (Bust of Patroclus). H. Gaucheraud opined similarly in his presentation of Daguerre's invention, on 6 January 1839 [1980: 18], when he wrote: "Travelers, you will soon be able, perhaps, [..] to bring back to France the most beautiful monuments, the most beautiful scenes of the whole world. You will see how far from the truth of the Daguerreotypes are your pencil and brushes. Let not the draftsman and painter despair; M. Daguerre's results are something else from their work, and in many cases cannot replace it".

91. Talbot, 1844. Plate XVI, The Ladder.

92. Cf. Gaucheraud, 1839 [1980: 18].

93. "For this semi-durable paper, which retains its whiteness for years in the shade, and yet suffers a change whenever exposed to the solar light, is evidently well suited to the use of a naturalist travelling in a distant country, who may wish to keep some memorial of the plants he finds, without having the trouble of drying them and carrying them about with him". Talbot, 1839 [1980: 25-26].

a two-year-long Grand Tour (1809- 1811) in Portugal, Spain (Seville, Jerez, Cádiz, Gibraltar), Sardinia, Malta, Albania and Greece -the Continent was in the throes of the Napoleonic Wars and he chose these safer destinations. Disraeli travelled to Palestine, though not in his case for tourism but to more closely study his Hebraic roots. Who did travel for reasons of erudition and leisure was Lord Lindsay, 25th Earl of Crawford, between 1837 and 1838 —that is to say, when the calotype was about to see the light. The account of his trip (*Letters on Egypt, Edom and the Holy Land*) was published shortly before. Likewise the journey undertaken by David Roberts to the Holy Land, Syria, Idumea, Arabia, Egypt and Nubia between 1838 and 1839, from which he returned with several hundred drawings and watercolours, from which he would make the 247 epoch-making coloured lithographs put up for sale between 1842 and 1849. In a word, the nobility had to give way to the bourgeoisie for the technically consolidated calotype to become the inevitable companion of continental, Mediterranean and Middle Eastern tours which they themselves had made fashionable.

This is what happened with Roger Fenton, an amateur painter who discovered photography at the Great Universal Exhibition of London (1851) and started to take calotypes with him on all his travels to distant lands:on the trip he took to Kiev, Moscow and Saint Petersburg, photographed for the first time in history thanks to him; or one that led him, in 1855, to document the Crimean War (1853-1856), when Disraeli's government supported the Greeks against the Ottoman and Russian empires. Fenton was not only the first war photographer but also the first one to be hired by a museum (the National Gallery of London) to carry out one of the utilities of the calotype anticipated by its creator: to copy all the works of a museum and use the calotypes in cataloguing and conserving them.

Nor was Francis Firth an English nobleman but a printer who had grown rich and could finally devote himself full-time to his greatest passion, photography. The albumen silver prints he had taken in the Sinai Peninsula and Palestine between 1856 and 1859 were put up for sale from the late 1850s onwards. They initiated a new stage in travel photography, associated with the memory of trips and consumption. The new social uses of photography compared to the original ones are perhaps best illustrated with the transfer of the Calotype Society (1847) to the Royal Society of Photography (1853), which Tucker (2005: 22) explains thus:

> In 1847, the Calotype Society included well-known scientists and inventors, such as the chemist Robert Hunt and Scott Archer, the inventor of the collodion process in 1851, as well as male and eventually a few female members of the social elite. One gentleman amateur who attended the first Calotype Society meeting described it this way: "We have attended a meeting of a society composed of a dozen gentlemen amateurs associated together for the purpose of pursuing their experiments in this art-science (we scarcely know the word fittest completely to designate it); who carry on their operations at different times and places—some residing in the country—but keep up a constant communication with each other, detailing their several improvements and discoveries, and interchanging the repetitions of such sun-pictures as each may have produced." By the 1850s, the elite and middle-class social base of photography was expanding. In 1853, the Royal Photographic Society was founded, borrowing from the model of the Calotype Society and its French counterpart, founded in 1851. Members might also belong to the Royal Society, the Linnaean Society, the Society of Antiquaries, or the Royal Academy[94].

The application of photography to natural sciences was stagnating

Despite the clear transfer of the different applications of the calotype, born and bred among the linen sheets of the British aristocracy but surrendered to (or perhaps seized by) the bourgeois middle class of British, French and American democracies, there was a territory where this transfer was yet to be realised: science.

The first unfavourable judgments that members of the Royal Society, such as the already cited botanist and illustrator Hooker, had issued on the scientific applications of the calotype did not discourage Talbot. It was not by chance that he had addressed a botanist and not a zoologist, for example; nor that *The Pencil of Nature* offered a calotype printed by contact with a tree leaf: the proximity between his invention and botany was clear for several reasons.

> Advances in photography were linked with the creation of communities and viewing audiences that were modelled on botanical exchange. Early photographers' interests centred on the study of nature and its forms. Like objects displayed in curiosity cabinets and early-modern still-life paintings, early calotypes of natural subjects offer precise visual details; like trompe l'oeil paintings, they also implicitly allude to the optical techniques of microscopy. Botanical specimens such as flowers and leaves provided the subject matter

94. Tucker, 2005: 22.

for many of Talbot's calotype experiments. Furthermore, the physical placement of objects in Talbot's photographs borrowed from the traditions of natural history, even when he was not representing a botanical subject. The arrangement of hats in Talbot's salt print from a calotype negative "The Milliner's Window" (ca. 1842), like Daguerre's daguerreotype, "Arrangement of Fossil Shells" (1837 39), mirrors the display of objects in seventeenth- and eighteenth-century natural history drawings.[95]

An important step in the right direction of applying photography to science was taken by Anna Atkins, an English botanist, the daughter of a botanist and a photographer, the author of *British Algae: Cyanotype Impressions*. Between 1843 and 1854, Atkins produced more than 400 images of algae native to the British Isles, reproduced through the *cyanotype* method on paper. This procedure had been invented by John Herschel (already cited here), and was carried out by direct contact of the specimens against paper treated with a solution of photosensitive cyanide. Cyanotype had the advantage over Talbot's calotype by contact method of not requiring any silver nitrate emulsion on paper, and that the image printed on it could be fixed by simply washing it with water. For the taxonomic designation and sorting of the reproduced specimens, Atkins used the Latin nomenclature set by Harvey that same year in *A Manual of the British Marine Algae* (1841). The photographer divided her more than four hundred bright, extremely elegant cobalt blue copies into twelve sections and grouped them into three volumes for their distribution. She herself edited and personally delivered the copies to the botanist members of the Royal Academy and to her friends (Talbot, among many others). Some of the specimens were arranged individually on the sheets; in others she pinned multiple specimens on them, top to bottom, in a manner similar to what used to be done in the illustrative watercolours of natural history researches and manuals.

While this step was important, neither cyanotypes nor calotypes had yet found a way to become scientific illustrations as effective and versatile as engravings, watercolours and other graphic illustration methods had hitherto been. And this not just because of the absence of colour in them, which is crucial for identifying each species; it was above all that the illustrators of the natural history of animals and plants had learned to offer on each plate all of the constituent parts of each species' body, its structural design, the resulting morphologies and even the generation process from seed to stem... Photography had to find a way to offer all of these elements on a single sheet of photosensitive paper, thus meeting the requirements that botanical or zoological science demanded from natural history illustrators.

What the illustrated *historiae naturalia* required from engraving and photography

After having studied living beings by their specific principle and cause, in *On the Soul*, Aristotle studied them again by their material cause in *History of Animals* (*Peri ta zōa historiōn*). This treaty consisted of a detailed description of the constituent parts into which could be broken down the living organisms that in this case belonged to more than 500 different species. The biologist from Stagira practiced dissection on specimens of several of these species and on bird embryos in order to study their internal organs and the evolutionary stages of their gestation and growth.

The plants and animals studied by Aristotle are equally made up of organic parts. He thus differentiated as organic parts, from which the whole of arboreal plants is constituted, the root (*riza*), the stem or trunk (*phitro*), the branches or arms (*kládoi*), the twigs (*lýgoi*), the leaves (*phýlla*) and the seeds. As the materials from which the constituent parts of plants are formed, he proposed wood (*phytro*), fibre (*desmoi)*, venous vessels (*fléb*), cavities ("stomachs": *koilía*), medulla (*muelós*) and bark (*floiós*)[96]. To these he added other fluid parts such as sap or juice (*chymos*[97]), which is not absent from any plant; and in some, resin, rubber, myrrh or frankincense. Not all and each one of these parts are found in all plant species. There are annuals that have no branches (e.g. wheat). There are grasses that have no stem (e.g. lawn grass). Fungi have neither branches nor leaves nor trunk. There are, in short, tree species that, to these internal and external parts, add others such as the flower (*anthē*), the buds (*blástē*) and the pericarp that envelops the fruits[98]. There are, moreover, fruiting plants and non-fruiting plants. Parts of the fruit of the former are the bark, the flesh, the stone or shell that contains the seeds, and the seeds themselves. The olive has all of them, whereas the fruits of other species have only some. There are many

95. Tucker, 2005: 21.

96. Cf. Aristotle *Peri phytōn*, A, 818 a 5-7.

97. Also in *Meteorōlogikōn,* Δ, 3, 380 b 2, 32, although not referred to plants.

98. Cf. Aristotle, *Peri zōiōn geneseōs*, A, 722 a 11-13. *Peri phytōn*, A, 818 a 13-14, b 28-30, 319 a 26-30.

differences in properties (colour, flavour, texture, size), relative position and potency of each one of the fruit's parts. The pericarp envelops the fruit in some species of fruiting plants, and in this case it counts as one of the fruit's external parts. The part that is never absent from a plant, fruiting or not, is the seed, observed Aristotle[99].

As regards the organic parts of animals, the zoologist from Stagira studied the ingestion and digestion organs in the genera and species he investigated, and those to do with the expulsion of organic waste after feeding. He also distinguished the breathing organs, which are the nose, the trachea and the lungs, in species that breathe. Also the reproductive organs of males and females, and other secondary differences in their respective bodies. He also studied the external and internal organs of tactile perceptions. He described the external and internal parts of the sense of taste, the external and internal organs of smell, the external and internal ones of acoustic perception, and the external and internal organs of visual perception. He differentiated the contrary parts universally present in bodies: front and back, top and bottom, and right and left with respect to their axis of symmetry. The bodily organ of common sense was situated by Aristotle in the heart. And he differentiated the organs of self-locomotion in the different families of animals, describing the feet and their parts, the fins and their parts, and the wings and their parts.

Having completed this anatomy of the bodies in the animal kingdom, Aristotle proceeded to dividing the superior genera into sub-genera, according to whether he found in one group of individuals some of the identified parts, and did not find them in the opposite sub-genus. The first major division he established was that of sanguineous and non-sanguineous animals. From these two macro-genera he gradually defined, by sub-genera and less and less universal differences in contrast, all the inferior sub-genera until reaching the species. Below them only the individuals would be found. To name the species, a binomial expression sufficed, one that included the first genus and the ultimate difference, e.g. *rational animal*. The taxonomic system created by the Stagirite is still used in today's botany and zoology, only updated by categories superior to genus (family, class, order) established by Linnaeus in his *Philosophia Botanica* (1751).

Natural history (*physikē historía*) as conceived by Aristotle is the science that explains the parts from which all functional organs are constituted, and consequently the body as a whole, in the bodies of individuals belonging to the species and sub-genera of each one of the two kingdoms of living beings, plant and animal. The Greek term *historia* means written description or list of something explored or investigated. Aristotle applies it to the natural sciences he cultivates, in expressions such as *hystoría tēs peri ta zōa*[100], *physikē historía*[101], *zōïkē historía*[102]. The same term passed without modification into Latin to signify the same genus of anatomical descriptions, giving rise to Pliny's *Naturalis Historiae* (1st C. AD), Gessner's *Historia Animalium* (Zürich, 1516-1565), the *Historiae Naturalis* (1665-1667) of John Jonston (1603-1675, Frankfurt); or, finally, also the *Historia plantarum generalis* (1686), by the father of contemporary botany, John Ray (1627-1705).

For its part, Spanish adopted the Latin term without modifying it and gave rise to works such as one by Fernández de Oviedo, *Historia general y natural de las Indias* (its "Summary" published in 1526; and the complete edition, between 1851 and 1855); or the *Historia natural y moral de las Indias* (1590), by the Jesuit priest José de Acosta —both considered by Von Humboldt as predecessors to his *Cosmos* (1845). The qualifying term "general" or "moral" that accompanies "historia" in both cases refers to the written "description of "human types" and "social customs" in the different lands or habitats of which animals and plants were also considered to be an inhabiting part and the subject of the "natural history" offered in those same treatises.

As well as being the first one to establish the principle and material cause of animals and plants, Aristotle was also the first to suggest that the *Natural History* text be completed with a series of illustrative plates. The biologist refers several times to a collection of drawn (*diagraphai*[103]) or delineated (*diagramata*[104]) anatomies (*anatomai*[105]), we assume on

99. Cf. Aristotle, *Peri zōiōn geneseōs*, A, 722 a 14-16. Γ, 752 a 18-21. *Peri phytōn*, A, 818 a 30-34, 820 a 37-b 25. On the pericarp, cf. also Theophrastus, *Peri phytikōn aitiōn*, A, 21:1.

100. Aristotle, *Peri zōōn moríōn*, Γ, 14, 674 b 16-17. Δ, 9, 689 a 18. 13, 696 b 14-15.

101. Aristotle, *Peri zōōn moríōn*, B, 3, 650 a 31.

102. Aristotle, *Peri zōōn moríōn*, Γ, 5, 668 b 29.

103. Aristotle, *Peri ta zōa historiōn*, A, 17, 497 a 32. Δ, 1, 525 a 8.

104. Aristotle, *Peri ta zōa historiōn*, Z, 11, 566 a 15.

105. Aristotle, Peri anapnoēs, 16, 478 b 1. Peri pneúmatos, 4, 483 b 24. Peri ta zōa historiōn, Γ, 1, 509 b 22. Δ, 4, 529 b 19, 530 a 30-31. Z, 10, 565 a 12-13. 11, 566 a 14-15. Peri zōōn moríōn, B, 3,650 a 31. Γ, 5, 668 b 29. 14, 674 b 17. Δ, 9, 689 a 19. 13, 696 b 14-15. Peri zōiōn geneseōs, A, 11, 719 a 10. B, 4, 740 a 24. 7, 746 a 22.

papyrus, which showed specimens (*paradeigmata*[106]) of the body, or parts of the body, of the species described in writing in the *historiae*. We should not forget that both *Peri ta zōa* and its illustrations were created in benefit of research and teaching at the Lyceum, the school founded by Aristotle. It is therefore understandable that the general purpose of such illustrations was to make it *easier to observe* (*theōrēsai raidion*[107]) the organic parts described in the corresponding texts in benefit of teachers and pupils. More particularly, Aristotle pointed out the advantage that the plates provided a more unblemished *precision* (*akríbeia*[108]) of description than the lengthy discourses that would have to be employed to describe the same thing in words. He referred this, for example, to the description of the relative position of the organs in the body of the animals of a species, or the parts of the same organ[109], etc. He also associated it with the external form (*schēmata*[110]) of a body, perceptible as a the resulting whole of the integration of all internal and external parts of the studied organs. In terms of the accuracy of the description, an image was worth a thousand words, in this case as is habitual according to the proverb.

The collections of anatomical drawings, which for Aristotle were inseparable from the written descriptions (*ek tōn historiōn kai tōn anatomōn*[111]) given in the natural sciences, have unfortunately not survived. Nor do we know whether he had them illuminated with colour or if they were only drawings. In any event, they are the first predecessors of the plates, illuminated or not, that have accompanied the anatomy treatises printed as far back as the Gutenberg era. Examples are the engravings by Jan Stephan van Calcar and Domenico Campagnola for the decisive *De humani corporis fabrica* (1543), by Vesalius. Those by Gaspar Becerra and Pedro de Rubiales for the *Historia de la composición del cuerpo humano (History of the composition of the human body),* (1550), by our own Valverde de Amusco. Or the extraordinary illuminated engravings by Matthäus Merian, printed in the *Historia Naturalis: De Avibus* (1665- 1667), by Jonston. The illuminated plates by Olof Rudbeck the Younger, for his *Lapponia Illustrata* (1701). And the plates (not illuminated) by Georg Dionysius Ehret, for the *Species Plantarum* (1753) by Linnaeus. In Spain, the plates illuminated by Francisco Javier Matís for the *Flora de Bogotá*, by the illustrious botanist of New Granada, our Mutis. Or the engravings by Antonio José de Cavanilles, for the *Monadelphiae classis dissertationes decem* (1790), of which he was also the author. And so we come to the illustrations of the botanists who were contemporaries of Talbot's: the ones produced, for example, by the botanist who had refused to use his calotypes as a means to illustrate his scientific research, William Hooker.

> "Your beautiful *Campanula hederacea* was very pretty as to general effect —but it did not express the swelling of the flower, nor the calyx, nor the veins of the leaves distinctly".

It was understandable that the first photographs should have encountered difficulties in attaining the mastery achieved by engravings after centuries of practice. The images of a Hooker or a Turpin suited, on one hand, an unequivocal scientific purpose: to transmit the right information on the external appearance, morphology and number (when essential) of the internal or external organic parts of each species' individuals, in such a way that the engraved specimens would be key in sidentifying any of the individuals of a species.

Together with this purpose of visually identifying a species and of transmitting this knowledge, the illustrations also had a visual and aesthetic purpose, and this could bring the artistic impulse into play. What was essential was to outline with a pencil and use ink for the definitive strokes and the shading to indicate the volume of the bodies and their parts. Colour gouache on an engraving was unnecessary; Carl Linnaeus did not employ it on those accompanying his treatises although it could be convenient in facilitating the species' identification from the natural colour of its parts. Illustrators could develop their artistic leanings with greater or lesser impetus and with more or less success. Linnaeus (1751: 9-10) classified the results of botanical illustration into four categories: *pretiosae, malae, usitatissimae, exoticis*, and provided names of illustrators who fell into each one of these categories. In any event, this function had to be subordinate to the primary, scientific purpose, the essential condition for the plates to become *usitatissimae*.

Botanical and zoological illustrators had learned to make inverse use, so to speak, of the *imagination*. They knew how to

106. Aristotle, *Peri zōiōn geneseōs*, 7, 746 a 14-15.

107. Aristotle, *Peri zōiōn geneseōs*, 7, 746 a 14-15.

108. Aristotle, *Peri anapnoēs*, 16, 478 b 1. *Peri ta zōa historiōn*, Γ, 1, 509 b 24, 511 a 13. *Peri zōōn moríōn*, Γ, 5, 668 b 29. 13, 696 b 14.

109. Aristotle, *Peri anapnoēs*, 16, 478 b 1. *Peri ta zōa historiōn*. A, 17, 497 a 32-33. Δ, 1, 525 a 8. 4, 529 b 19.

110. Aristotle, *Peri ta zōa historiōn*, Γ, 1, 511 a 13-14. Z, 10, 565 a 12-13.

111. Aristotle, *Peri zōiōn geneseōs*, A, 11, 719 a 10. B, 4, 740 a 24. 7, 746 a 14-15.

subtract all the elements from the natural reality of a species' bodies that were not useful for fully achieving a scientific judgment based on the images of the engraving. A sketched plant could not show, for example, as many branches as those on a mature specimen of its species but only the right number for that species to be correctly identified. Conversely, it could not omit the fact of its flower having one or two pistils, for that was certainly the differential in determining the subgenus of each species (this has been true since Linnaeus). So the illustrators did an abstraction, or subtraction, of anything that might be deemed non-essential for the specific identification of individual cases. They also subtracted anything that might induce the scientist's or pupil's imagination to be activated into following rabbit holes that would make intellectual apprehension more difficult. This is why illustrations showed only that which, when viewed, and without the possibility of imaginative detours, could be easily judged to be the quintessence of the reality of an individual belonging to the described species.

To achieve that result it was a requirement to draw and engrave perfect specimens, such that would show all the organic parts corresponding to the integral *natural* development of that species' individuals. Or as Linnaeus suggested to herbalists (1751: 10): complete specimens *observandae partes omnes*, with no mutilations or pruning, etc. The same for each one of its organic parts, each one entire, without defects, infections or parasites (*plagula non alliganda*). In fruiting species, engravings should also offer their constituent parts (*fructificatione praeferente*). The integration of all these organic parts had to give rise to the external shape of the body as a whole, of a fully developed, adult specimen: the morphology of the oak, as an oak, and that of the apple tree, as an apple tree.

If the photographer had to shoot specimens of such perfection, he would have to search carefully for them in nature, for not all individuals of a species develop and grow with the same perfection in their parts and as a whole. In this he would lag behind the engraver, who can take as many living specimens as he requires, some more perfect, some less, and from them come up with one *typical* specimen. It would feature the perfections of each one of the natural specimens of his samples, but none of the imperfections or blemishes would be found in them. That specimen of capital perfection, a hard one to find in nature, can be drawn and engraved from parts belonging to different natural individuals, reorganised by the engraver's imagination as parts integrated into an individual specimen to succeed in having it represent a more complete and perfect one, more real in a certain sense than all the natural samples.

Moreover, the engraver would remove anything that was accidental for the graphic description of the perfect specimen. They would not be sketched with incisions in the bark, nor with fungi or parasites, or next to beings from another species, nor would he necessarily draw them with all their branches or fruits, or with all their fur. The botanical or zoological illustrator would abstract all the singular particularities that did not add essential information to their specimen, although never would one find in an individual of that species, for example, a stem as clean and polished as he shows it in his engraving. But even if the engraver wanted to make the graphic specimen more realistic, he could represent on its trunk the stump or stumps left behind by the cuts or pruning of supernumerary branches. This would not affect the representation of the perfect specimen, but those signs would indicate how they should appear in natural specimens, those accidental branches or leaves not drawn, in their also realistic positions.

But a photographer could prepare in a similar manner the specimen he is about to photograph (by cutting some of its branches, for example). And he could perhaps also remove by means of an intermediate negative any details that did not interest him in the final version of the image. But in no case would he have as much freedom as the illustrator in creating his plates. Furthermore, if the photographer were to excessively manipulate his photographic images, he could lose what Talbot described as "the great air of reality"[112] that they naturally have when the painter's hand does not intervene in the process of their photographic production.

Additionally, if the anatomist asks the engraver to represent an animal's vascular, or muscular or nervous system, the engraving can offer all the parts of that system down to the last ramifications, but making an abstraction of the rest of the systems juxtaposed to or overlapping it. It was not possible to obtain a photograph like those of human figures that illustrate human anatomy books, which consist of only veins and arteries, or muscles without skin, or only bones. It was even possible to draw those skeletons standing perfectly upright, with their bony hand holding up the head, as you would never see in nature and how it could therefore never be photographed. For the anatomist engraver, this imaginary configuration of the skeletal or vascular system in his engraving would not detract from the scientific and teaching purpose of his work.

Further, the specimens of plants or animals engraved by botanical or zoological illustrators are presented on a plain

112. Talbot, 1844, Plate XIV. The Ladder.

white background or on one in a washed, pale and flat colour. Again, abstracting it from its natural context. It is possible to *imagine* a specimen so much out of context as what scientific illustrations present us with, but it is impossible to see it in this way in the reality of the physical world. And in this the photographer was again at a disadvantage when compared to the botanical or zoological illustrator, because controlling the backgrounds from which the photographed body would stand out could never be done as effectively as in the case of the engraver, who dispenses with them all.

In addition, the intact whiteness of the primed plate on which the engravings are printed favours the perception of the colour applied to the drawing and to each one of its parts. No ambient colour will modify the strictly local colour that the illustrator has copied from nature and transferred to his specimen, with far more purity and sharpness than what occurs in nature: *fucatae vivis coloribus* (Linnaeus, 1751: 9). In the physical reality, each surface's colours are under the chromatic influx of colour from all the adjacent surfaces and also under the influx of the dominant colour in the atmosphere, for all colours reverberate in it in an always differing manner depending on the time of day, atmospheric incidents, etc. Natural colours will ultimately never be as pure as the gouaches that can be applied to the engravings illustrating a scientific work. To compete with this factor, nascent photography, which is blind to colour, would have to find equivalents in the differentiated gradations of halftones.

The plants and animals engraved on plates float on them. They have no floor to hold them up, nor earth into which to sink their roots. If these are represented in the engraved specimen, they do so denuded, in a way never observed in nature –unless we distort the natural position of plants. As for the position of the stem, it should never be represented in a flexed, much less broken position, but erect (a slight curvature was acceptable for aesthetic reasons). In any event, photography does not have this capacity for abstraction either, nor can it offer the complete image of a living organism floating in the void of nature, like the engraved specimen does on the pristine paper on which it has been printed.

Furthermore, engraved plant or animal specimens are defined according to a fixed focal point not subject to exposure time. All parts of the engraved body are offered with a clearcut definition. They are assumed to normally be illuminated from the top left part of the paper on which they are printed, and from that focal point the lines are composed that will indicate the shadows produced by the variations in volume in each part of the body. But what is not represented is the shadows that this specimen would project on other surfaces, or on the floor, should it be standing in nature. The photographer, however, working naturally on photographing species, would not have that capacity to set the position of the spotlight at will, nor to ensure the constancy of the light that illuminates the capture. The spotlight required by the advanced parts of the specimen would not necessarily be valid for the one required by the behind parts. Nor can the photographer abstract the shadows that the photographed bodies project on the bodies around it or underneath it.

With the botanical or zoological plate one can juxtapose, together with the complete specimen drawn on it, sketches of some of its parts, or broken up into further parts, e.g. the joints that articulate the leaves and the branch, or the branches and the trunk. It is possible to juxtapose, on the same print surface, an engraving of the front and another one of the back of the organ (e.g. fruition) in a species in a way that the photographic view or camera cannot do unless the viewing position is modified. The botanical illustrator can draw to scale the buds and their parts, the seeds and their parts, the fruits and their parts, the cross section of some of them, etc. The illustrator is free to place those detailed engravings on the print paper where he deems most suitable. He may, for example, place the detailed engraving of the root on the lower part of the plate, and those of the fruits or seeds in the top, to thus indicate the direction of the natural feed and growth cycle inherent to the plant kingdom. In this way a single plate can offer not just one but two, three or several engravings simultaneously, setting up a hierarchy of the principal one as such and the detailed engravings as subordinate. Or offer specimens of a different species, perfectly arranged on the print sheet. But the photographer can change neither the focus nor the scale of the parts in one same photographic image; nor can he offer at will in one same photographic image specimens of the same or different species unless they are as they offer themselves, arranged or not, in nature.

Up to this point, these are some of the requirements that natural sciences imposed on engravings, whether illuminated or not, so that the graphic presentation of the specimen of the species being studied was precise in its details yet essential; in other words, abstracted of anything that might be accidental for the scientific and didactic purpose. Henceforth, the illustrator's sensibility might intervene, and do so in the most decisive way. Because if the choice of specimen, and of the intrinsic or seasonal parts, and of the details to be shown, are scientific decisions, the layout on the page of the engravings of bodies and their parts, together with the detailed engravings of some of them, plus the quality and distribution of the colour gouaches on the parts and the resulting view of the whole, all that was the responsibility of the illustrator. This is where his freedom as an artist began, although it could never go so far as to erode the principal purpose, the scientific one. Botanist, painter, sculptor: this was the training and hierarchical order of the disciplines which Linnaeus (1751: 9) demanded from a good botanical illustrator.

Neither the daguerreotype nor the calotype had yet developed procedures for competing with the iconography of botanical and zoological sciences. But the British nation —one to whose talent Talbot had entrusted the progress of his invention— again offered an unparalleled opportunity to drive forward its development.

Finale: as it was in the beginning, is now and will be forever

> The Great Exhibition of 1851 spurred the growth of photography by showing what could be done. Held at the Crystal Palace in London, it was the world's first international photographic competition, with submissions from England, France, Australia, and North America. Never before had so rich a collection of photographic images been assembled in one place from so many parts of the world. At a time when many people did not see scientific photographs and when there were few models to be imitated, events such as the Great Exhibition of 1851 offered unprecedented access to important examples of contemporary photographs, particularly those of scientific phenomena such as astronomical photographs and photomicrographs. Spectators thrilled to see various optical entertainments and exact representations of places and subjects that satisfied the philosophical and the curious[113].

The interest of the London public in the results obtained by the daguerreotype and the calotype could be understood, according to the organisers of the photography competition, as proof of the unstoppable democratisation of photographic methods. All the more so since the use of dry collodion, invented by Archer, facilitated the transporting and handling of the equipment while bypassing Talbot's onerous patent.

There was something, however, which the judges of this photography contest could not fail to point out. Among them there were some notable scientists, such as James Glaisher, an eminent meteorologist, astronomer and photographer. These men of science had actually not found in the competition sufficient signs of what photography could contribute to scientific research. The result, as she had been, of the developments in chemistry and optics since the start of the century, fifty years later the daughter of science could still be deemed to be in debt to her progenitors. This is how the members of the jury expressed it in their official report at the closing of the contest.

> "We may be permitted to record some degree of disappointment at the absence of specimens of the application of photography to any departments of representation, other than those such as please the eye or administer to personal feelings." As regarded its "application to an infinity of useful and instructive purposes," the judges declared, "we have literally nothing!" "Rapid as have been the discoveries connected with Photography, and great as are the improvements it has received since the invention of M. Daguerre, there is yet much to be done to enable it to rank amongst the sciences of the age." Photography was "yet in its infancy." Overall, they held that there were few photographs that were useful or scientifically instructive[114].

It is true that photography still had a long way to go before finding its own, genuine application as a means of scientific illustration and as a means of artistic expression. But its first ten years of life had proven its vast potential, and a self-sufficient force for development already in place, that was unstoppable. Talbot (1844, Introductory Remarks) had prophesied it, in the English style, *cautiously*, when he observed that photography is "likely in all probability to be much employed in future". The almost two centuries that have passed since then have more than proven him right, a hundredfold.

Vision, imagination, memory and intellectual grasp, active before each photograph we view, succeed in linking up together in such different living ways that each need and each taste has found the way to engage with it. Our humanity, enriched since 1839 by the discoveries of Daguerre and of Talbot and of their successors, inhabits a cosmos, a physical environment and a community of men and women that, no matter on which medium we photograph them (paper, celluloid, film, digital), live before us, and in ourselves, as *imagined* images over which inevitably flow our perceptions, our emotions and our judgments.

113. Tucker, 2005: 22.

114. Tucker, 2005: 26.

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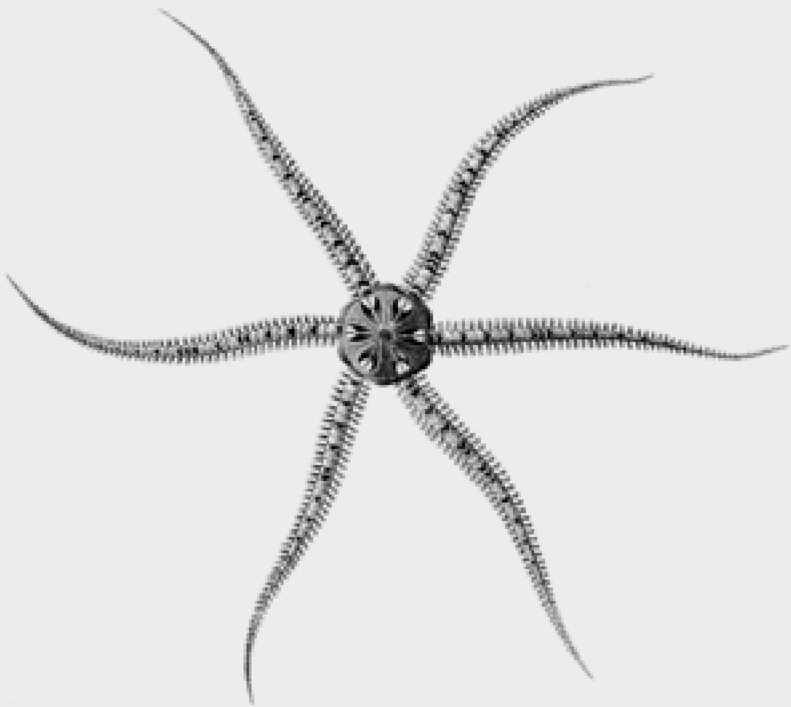

This catalog is dedicated to the Memory of Rafael Levenfeld Ortiz, who passed away on November 2, 2023.
Rafael had the opportunity to present the exhibition at the theater of the University of Navarra Museum.
His intervention was recorded at https://youtu.be/UPNSaiV1zKo

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