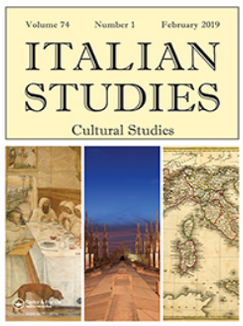

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Art and Science in Calvino's *Palomar*: Techniques of Observation and Their History

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ABSTRACT

This article proposes a new reading of Italo Calvino's *Palomar*, focusing on its combined interest in the histories of art and science. By examining the text alongside Calvino's readings and writings from the same period (1975–1983), it demonstrates that Calvino was concerned throughout to explore parallels in the artistic and scientific histories of (objective) observation and of the techniques and instruments that serve to faithfully represent and communicate the results of such observations. Calvino's privileged interlocutors are Leonardo da Vinci and Galileo but they also include a wide range of historians of art and science, zoologists, painters and botanists. The objects of this quest are mostly to be found in nature: animals, plants, stars and the sea. What emerges is a Calvino who writes a much more concrete, stratified history of science and art than is usually recognized.

KEYWORDS

Palomar; Italo Calvino; history of science; history of art; nature; objectivity

Introduction

Palomar is an assembly of ironic sketches around what has been called a 'personaggio-telescopio' of an equally clear-eyed, objectively gazing author.[1] The last novel to be published in Calvino's lifetime, it centres around Palomar, a somewhat elderly protagonist (part philosopher, part phenomenologist) who looks at the world around him in an uncommon manner, singling out and reflecting upon unusual details, patterns and appearances. Published as a novel in 1983, Palomar stories appeared from 1975 onwards in Italian newspapers, a period spanning eight years. Partly for this reason and partly because of the natural process of writing that involves selecting and discarding, not all Palomar pieces actually ended up in the published volume: a significant selection of Palomar's misadventures can be found instead in other sections of the 'Meridiani' publications of Calvino's *Romanzi e racconti* or *Saggi*.[2] Although one of Calvino's shortest volumes, *Palomar* has elicited many analyses. Notwithstanding the breadth and variety of these analyses, there are some constants and patterns in the readings that tend to blur other possible readings. Apart from thematic articles on the book, generally speaking two types of (often combined) reading strategies can be evinced: on the one hand, the volume tends to be read in an autobiographical light, which, in my view, narrows the scope of a potentially much more

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[1]For a recent example among the many possible examples: Sara Ceroni, 'Epiphanic Illuminations: Rewriting the Observatory in Italo Calvino's *Palomar* and Julio Cortazar's *Prosa del Observatorio*', in *Calvino's Combinational Creativity*, ed. by Elizabeth Scheiber (Newcastle Upon Tyne: Cambridge Scholars, 2016), pp. 23–40 (pp. 23–24).

[2]Italo Calvino, *Romanzi e racconti*, ed. by Mario Barenghi and Bruno Falcetto, 3 vols. (Milan: Mondadori, 1994); Italo Calvino, *Saggi 1945–1985*, ed. by Mario Barenghi (Milan: Mondadori, 1995).

wide-ranging book.[3] The alternative view is a predominantly abstract, theoretical and philosophical reading of the heuristic, ethical or epistemological issues that arise in *Palomar*.[4]

In this article, I explore how Calvino draws out the connections between the histories of artistic and scientific practices by showing how research on observational techniques and representational practices underlies these histories. It is my contention that Calvino tried to capture a shared nucleus in science and art that lies in their historical potential to paint a picture of the observable world. In the *Lezioni americane*, Calvino writes about the *Cosmicomiche*; he states that, already in these tales, he had asserted his intention to bring science back in the realm of what can be imag(in)ed.[5] (Postmodern) critiques on science had problematized its 'objectivity', a concept which had become almost coterminous with science since the mid-nineteenth century.[6] This 'scienza incerta, approssimativa' is clearly present in *Palomar*, in a form that represents not a superficial citation but a continuous dialogue throughout the volume, spanning from the Renaissance to (post)modernity.[7] Calvino was conscious that science had absorbed postmodern questions and issues, that scientists did not naïvely believe in a neutral language, and that this consciousness potentially destabilized the notion of objective knowledge.[8] In *Palomar* Calvino shows the interrelatedness of different ideals and the way in which scientific and artistic ideals cut across presumed paradigmatic divides.[9]

This article interrogates intertextual references and intellectual acknowledgements that are woven in and around *Palomar*, concentrating primarily on what Calvino refrains from stating explicitly, in the paratext and context, in the preliminary reading and in the essayistic contours that surround his work.[10] The interpretation addresses the role of visibility for Calvino, which will be read, quite literally, as an interplay between text, image and imagination that is fundamentally inscribed within the *Palomar*-project as a form of 'polysemic intertextuality' between the (implied) figurative and the discursive.[11]

The first part of the article looks at the interconnections between science and art that were uncovered by art historians and historians of science alike during Calvino's lifetime. Their research dealt with problems inherent in observation and the history of responses to observational obstacles, most notably: perspective. The idea is not to contribute to a better understanding of the historic developments as such, but more to show how 'common knowledge' circulating in intellectual circles brought together separate disciplines in a single narrative that was taken up by Calvino. An exploration of Palomar's attention to nature and animals follows, stressing the role of instruments, or the lack thereof, in his perambulations and observations. Among these instruments is also the language of the writer Calvino and, more specifically, terms like 'disegno' and 'quadro', which are meaningfully related to the history of observation and representation. In the last section Palomar's need for control and categorization in the quest for knowledge is

[3]See, for instance, Eugenio Bolongaro, 'Italo Calvino and the Role of the Intellectual: Autobiography in Fiction', in *Creative Interventions: The Role of Intellectuals in Contemporary Italy*, ed. by Eugenio Bolongaro, Rita Gagliano and Mark Epstein (Newcastle upon Tyne: Cambridge Scholars, 2009), pp. 115–40.

[4]Mario Porro, 'Letteratura come filosofia naturale', in *Italo Calvino: enciclopedia, arte, scienza e letteratura*, ed. by Marco Belpoliti, special issue of *Riga*, 9 (1995), 253–82.

[5]Italo Calvino, *Lezioni americane: sei proposte per il nuovo millennio* (Milan: Mondadori, 2000), pp. 89–90.

[6]Cf. Steven C. Ward, *Reconfiguring Truth: Postmodernism, Science Studies, and the Search for a New Model of Knowledge* (Lanham, MD; London: Rowman and Littlefield Publishers, 1996); Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007).

[7]Italo Calvino, *Palomar* (Turin: Einaudi, 1983), pp. 63–64.

[8]Calvino, *Saggi*, pp. 229–31; Jeff Wallace, '"The World Before Eyes": Calvino, Barthes and Science', in *The Third Culture: Literature and Science*, ed. by Elinor Schaffer (Berlin: De Gruyter, 1998), pp. 269–83.

[9]Pierpaolo Antonello, *Il ménage a quattro: scienza, filosofia, tecnica nella letteratura italiana del Novecento* (Grassina: Le Monnier Università, 2005), p. 185.

[10]I therefore refer to older sources, many of which were published by Einaudi.

[11]Franco Ricci, 'Immagini in posa, immagini in prosa: Calvino-Gnoli: un'arte a parte', *Veltro: rivista della civiltà italiana*, 40.3–4 (1996), 157–61, (p. 161).

reappraised, predominantly through the tropes and reality of the encyclopedia, the museum and the zoo.

Observation and Perspective: Life in the Grid of Objectivity

> All epistemology begins in fear – fear that the world is too labyrinthine to be threaded by reason; fear that the senses are too feeble and the intellect too frail [...]. Objectivity is a chapter in the history of intellectual fear, of errors anxiously anticipated and precautions taken.[12]

One might say that *Palomar* is a doubt-ridden reflection of that fear, and of the desire to overcome this fear by transcending, bracketing, disciplining or erasing the self.[13] Through Palomar's quest, Calvino depicts the historically layered concept and ideal of objectivity. This search for objectivity does not proceed through paradigmatic breeches, but through advances into and retreats from different concatenations of ideals that Daston and Galison call 'truth-to-nature', 'mechanical objectivity', 'structural objectivity' and 'trained judgment'. The first represents a form of 'realism of underlying types and regularities against the naturalism of the individual object, with all its misleading idiosyncrasies'. Mechanical objectivity instead aims at automatism, to produce images 'untouched by human hands'. Structural objectivity wields war on images and seeks refuge in structures, whereas trained judgment implies an observer who, through experience and training, acquires a form of heightened vision.[14] Palomar tries all variants, but not in a linear manner, nor singling out one of these strategies at a time: instead he shows how these ideals are bound to interfere with each other, how cultural memory brings to the fore even what might be considered 'surpassed'.

An important premise of this article is that Calvino's interest in science and art should not be artificially (or anachronistically) separated if one is to understand Palomar's quest for 'objective' observation. I would argue that the reason Calvino is more often paired to science than to the art of painting is that we metonymically tend to associate the quest of science with a quest for objectivity, which befits Calvino's authorial image. But Calvino was arguably more interested in contextualized epistemology than in atemporal objectivity, and this interest was enhanced both by artistic and scientific readings. The critical attention to Calvino's imagery predominantly regards mental coordinates, abstract images that are formed in the mind, instead of concrete, context-bound images.[15] This is also true for science: Calvino is usually said to have had little interest in the concrete practice of science, in the way in which knowledge is gained.[16] Although this may be true, there is a difference between a scarcity of explicit references and a total absence.[17]

The history of scientific objectivity has 'constantly crossed paths with the history of artistic visualization, from which it has received some powerful challenges'.[18] Many art historians have examined this crosspollination, following the example of Erwin Panofsky, who famously interrogated the repercussions of perspective for vision and for the 'self' in that vision.[19] The *Enciclopedia Einaudi*, which Calvino reviewed in the spirit of Palomar ('Palomar e l'enciclopedia'), openly states that there is no clear distinction to be made in the foundations of science and art, at least in their more rudimentary forms.[20] This conflation was already noted in the famous

[12]Daston and Galison, p. 372.
[13]'Prologues' to that fear are for example 'Il mare dell'oggettività' and the 'agorafobia intellettuale' of 'Cibernetica e fantasmi'. Calvino, *Saggi*, p. 217; Antonello, p. 197.
[14]Daston and Galison, pp. 42–46.
[15]Eugenia Paulicelli, *Parola e immagine: sentieri della scrittura in Leonardo, Marino, Foscolo, Calvino* (Florence: Cadmo, 1996).
[16]Antonello, p. 169.
[17]Italo Calvino, *Lettere, 1945–1985*, ed. by Luca Baranelli (Milan: Mondadori, 2000), p. 819; *Saggi*, p. 1706.
[18]Chiara Ambrosio, 'Objectivity and Representative Practices across Artistic and Scientific Visualization', in *Visualization in the Age of Computerization*, ed. by Annamaria Carusi et al. (New York: Routledge, 2014), pp. 118–44 (p. 118).
[19]Erwin Panofsky, *Perspective as Symbolic Form* (New York: Zone Books, 1991), pp. 67–68.
[20]*Enciclopedia*, ed. by Romano Ruggieri, 16 vols (Turin: Einaudi, 1977), I, 620–21; Gerard Holton, *Thematic Origins of Scientific Thought: Kepler to Einstein* (Cambridge, MA: Harvard University Press, 1973), p. 436.

encyclopedia of Diderot and D'Alembert, who pointed out that everything starts with observation, both in science and art.[21] For Galileo everything starts when one begins to 'sollevare gli occhi da quelle carte', something which Palomar strives to do in many fragments, but most of all in 'La contemplazione delle stelle'.[22] Galileo writes these words when he compares the great artist to the mere copyist and transposes the logic of this comparison to a scientific context, thereby conveying scientific qualities with artistic standards.[23]

Systematic research on the history of scientific visualization dates back to the 1970s, the period in which Calvino published his first *Palomar* pieces.[24] The evidence that Calvino starts to piece together his interest in art and science during the years in which he writes *Palomar* is not confined to the parallel conception of *Collezione di sabbia* alone. The many reviews that Calvino writes in this period are a testament to his readings, and in some instances he himself points out the interconnections. Scientists like Ilya Prigogine and historian of science Giorgio De Santillana had Calvino's undivided attention precisely because they showed how even innovative scientific practices shared a core with narration and myth. De Santillana warned his readers that 'we must not superimpose our image of science as a criterion for the past'.[25] He also argued that, crucially, for a significant period in history the 'main avenue to reality was through art', an insight with which renowned art historians such as Ernst Gombrich concurred.[26] The 'constant search, this sacred discontent' that can be evinced in the history of art, can be likened to an important premise of the scientific *modus operandi*.[27]

Calvino's early interest in De Santillana, acknowledged only in the posthumous *Lezioni americane*, has received a fair amount of attention.[28] Gombrich is a less-cited source, even though Calvino mentions him (and the likes of Dürer, Leonardo, Van Eyck, Vermeer and Lorrain) in his review of Ruggero Pierantoni's book *L'occhio e l'idea*, thereby stressing the important overlap in the histories of art and science.[29] In the aforementioned 'Palomar e l'enciclopedia', the connections between scientific and artistic obstacles to observation and knowledge are explored by Calvino, who performs an in itself encyclopedic, structured, sequential reading of the first volume 'Abaco-Astronomia' which reads as a possible programme for *Palomar*: 'Due immagini d'una totalità centrifuga: l'*Astronomia* delle galassie in fuga e l'*Enciclopedia* d'un sapere sempre più difficile da tenere insieme, con al centro un *Anthropos* sempre meno sicuro del suo antropocentrismo.'[30] The dialectic core is formed by 'anthropos-animali' around which spiral both a meta-analysis of the concept of the encyclopedia and a view of the cosmos in the entry on 'astronomia'. Calvino writes of Massimo Piattelli Palmarini's contribution on 'anticipazione' that it explains how 'la neutralità scientifica dell'osservatore è sempre relativa, perché gli "schemi d'aspettativa" hanno ruolo in ogni processo di conoscenza, non solo ma anche nella percezione sensoriale' (terms that resemble those of Gombrich).[31]

[21] *Enciclopedia*, 898.
[22] Galileo Galilei, *Le opere di Galileo Galilei: Opere astronomiche. 1842–1853*, ed. by Vincenzo Viviani (Florence: Società Editrice Fiorentina, 1856), p. 465; Calvino, *Palomar*, pp. 44–49.
[23] Eileen Reeves, *Painting the Heavens: Art and Science in the Age of Galileo* (Princeton: Princeton University Press, 1997), p. 11; Leonardo da Vinci, *Trattato della pittura di Leonardo da Vinci: condotto sul cod. Vaticano urbinate 1270* (Rome: Unione Cooperativa Editrice, 1890), p. 45.
[24] *Visual Cultures of Science: Rethinking Representational Practices in Knowledge Building and Science Communication*, ed. by Luc Pauwels (Hanover: University Press of New England, 2006), p. 29.
[25] Giorgio De Santillana, 'The Role of Art in the Scientific Renaissance', in *Critical Problems in the History of Science*, ed. by Marshall Clagett (Madison: University of Wisconsin Press, 1959), pp. 33–65 (p. 34).
[26] De Santillana, pp. 37–38; Ernst Gombrich, *Art and Illusion: A Study in the Psychology of Pictorial Representation* (New York: Pantheon Books, 1960), p. 324.
[27] Gombrich, p. 173.
[28] Domenico Scarpa, 'Torino, 29 marzo 1963. Italo Calvino e Giorgio de Santillana: l'esordio dell'iperstoria', in *Atlante della Letteratura Italiana*, ed. by Sergio Luzzatto and Gabriele Pedullà, 3 vols. (Turin: Einaudi, 2012), III, pp. 842–48.
[29] Calvino, *Saggi*, pp. 320–21.
[30] Calvino, *Saggi*, p. 1800.
[31] Calvino, *Saggi*, p. 1799; Gombrich, p. 320.

Many of the visual aids of early modern artists and scientists in their role as observers also accompany Palomar's search, albeit often in surreptitious ways. An obvious example is the image of Albrecht Dürer's 1525 *Draughtsman Drawing a Recumbent Woman* on the first-edition cover; this has received critical attention because of the important role it plays as the text's gatekeeper and because of the strong iconic impact of the elements that compose it. But the rhetorical side-effects of the image and the intermedial dialogue it opens with the text on the other side of the cover need to be addressed as much as its 'objective' content. Firstly, Dürer's woodcut has an almost unparalleled importance in books on perspective: the example seems mandatory in volumes on the topic and its circulation has made it something of a cliché. But the readings have varied and the interpretation is very much of the beholder: we may focus on the 'scientific' male presence, the instrumental grid that splits the image in two or on the recumbent woman, partially nude and in a pose that can be seen to invite but at the same time looks awkward. The picture warrants comment, it needs explanation and has in fact produced around it an impressive number of narratives. Most commentators on Calvino's use of the picture concur that it denotes the objectivity that Palomar (and Calvino?) strive for, but this is a somewhat one-sided reading of what it depicts. Franco Ricci, for example, writes that the cover 'visualizes Calvino's conception of the spectator stance [...]. The artist possesses absolute omnipotence in his ability to re-compose the world at will'.[32] The fact that the same picture adorns the cover of Susan Bordo's *The Flight to Objectivity*, which problematizes objectivity from a feminist point of view, shows that it can also convey a very different, even diametrically opposed message.[33] The irony which is so present in *Palomar* may already be at work in the choice of the cover.

If we examine some of the elements that constitute Dürer's woodcut we see the grid that is a quintessential element of early artistic and scientific observational techniques, used here to produce an equally divided image and the idea of proportion. There is also a half-nude model, which provided the common avenue to training the artistic eye by copying what one sees. Leonardo da Vinci explains this very clearly:

> Se ti vuoi assuefare bene ai retti e buoni posati delle figure, ferma un quadro ovvero telaio dentro riquadrato con fila, infra l'occhio e il nudo che ritrai, e quei medesimi quadri farai sulla carta dove vuoi ritrarre detto nudo sottilmente.[34]

The 'Il seno nudo' episode of *Palomar* could be read in light of this artist-model relationship: Palomar is only thinking (at least, in his mind) about the right way to behold nakedness (just like the protagonist of 'L'avventura di un fotografo' in *Gli amori difficili*), whereas his 'model' reacts as if he were a fastidious voyeur.[35] But the nudity of the model can also be seen more broadly as a reference to the nudity of feminized nature, which is conquered and possessed by the scientific or artistic gaze.[36] In either case, the 'omnipotence' of which Ricci writes is clearly problematized in 'Il seno nudo'.[37]

[32]Franco Ricci, *Painting with Words, Writing with Pictures: Word and Image in the Work of Italo Calvino* (Toronto: Toronto University Press, 2001), p. 105.

[33]Susan Bordo, *The Flight to Objectivity: Essays on Cartesianism and Culture* (Albany: State University of New York Press, 1987). See also Svetlana Alpers, 'Art History and its Exclusions: the Example of Dutch Art', in *Feminism and Art History: Questioning the Litany*, ed. by Norma Broude and Mary D. Garrard (New York; London: Harper & Row, 1982), pp. 182–99 (pp. 185–87); Barbara Freedman, *Staging the Gaze: Postmodernism, Psychoanalysis, and Shakespearean Comedy* (Ithaca: Cornell University Press, 1991), pp. 1–2; Lynda Nead, *Female Nude: Art, Obscenity, and Sexuality* (London: Routledge, 1992), pp. 11, 28.

[34]da Vinci, p. 49; see also Gombrich, p. 157.

[35]Calcaterra, pp. 140–1; Calvino, *Palomar*, pp. 11–14.

[36]Berenike Pasveer, 'Representing or Mediating: A History and Philosophy of X-Ray Images in Medicine', in *Visual Cultures*, pp. 41–62; Ladina Bezzola Lambert, *Imagining the Unimaginable: the Poetics of Early Modern Astronomy* (Amsterdam: Rodopi, 2002), p. 44.

[37]This matter, and the Enlightenment philosophy that underlies many of Calvino's own viewpoints, begs questions from a gender perspective which are beyond the scope of this article but which deserve critical attention. See, however, the following recent contributions: Dana Renga, 'Looking Out: Calvino's Vision of the "Economic Miracle"', *Italica*, 80.3 (2003), 371–88; Paola Govoni, 'La casa laboratorio dei Calvino Mameli tra scienza, arte e letteratura', *Belfagor*, XVII.5 (2012), 545–67; Bridget Tompkins, *Calvino and the Pygmalion Paradigm* (Leicester: Troubadour, 2015).

Perspective is another important part of the dialogue between the cover and the stories in the book. The scene depicted by Dürer is an important exercise in perspective. Perspective, as Panofsky has famously argued, creates an interesting paradox: on the one hand, it represents an attempt at a more 'objective', measurable viewpoint, but at the same time it makes the individual, the observer, important: the centre of perspective is the eye that perceives, the rays converge in precisely that point of the retina. Perspective can lead to feelings of detachment from the viewed world but may also provide the viewer with a somewhat megalomaniac feeling of being the centre of the theatre of vision. Panofsky concludes:

> Thus the history of perspective may be understood with equal justice as a triumph of the distancing and objectifying sense of the real, and as a triumph of the distance denying human struggle for control; it is as much a consolidation and systematization of the external world, as an extension of the domain of the self.[38]

Calvino is well aware of this peculiar function of man as 'strumento', as can be seen in the Palomarian reflections on the sun-sword, or on the moon in the afternoon: both need his eye to be seen (but he has trouble convincing himself of this fact).[39]

Art is an indispensable tool for this 'uomo-strumento':

> E l'arte? L'arte sarà riflessione sulle forme, ipotesi di formalizzazioni visive d'un mondo virtuale; e sarà anche riflessione sul mondo dato come oggetto visuale, critica dell'esposizione permanente del mondo in cui siamo coinvolti, nel triplo ruolo d'espositori, d'esposti e di pubblico.[40]

In 'Palomar e Michelangelo', a story that explicitly refers to art but that, like 'Palomar e l'enciclopedia', was not included in the book, Calvino uses the exact same words as he writes about the *uomo-strumento* in 'La penna in prima persona': 'Le forme create dall'uomo essendo sempre in qualche modo imperfette e destinate a cambiare, garantiscono che l'aspetto del mondo quale lo vediamo non è quello definitivo ma una fase d'approssimazione verso una forma futura.'[41] Similarly, among the notes for the 'racconto della vista' that was scheduled to appear in *Sotto il sole giaguaro*, Calvino writes the following:

> partendo dalla ricerca dei funghi col padre [...] Il mondo come oggetto visivo. Gli occhi, i nostri occhi come strumento attraverso cui il mondo si vede [...]. Arte: crea visività [...] e trasmette visività (pittura "dal vero", pittura "sulla" vista cioè impressionismo) (E la fotograf.? Il cine?).[42]

Here, again, Calvino places scientific and artistic practices of interrogation of perspective and vision on the same continuum (or, at least, in the same notes). Nonetheless, perspective in the end is one of the precious illusions of mankind, as Calvino repeats several times in *Palomar*, for example in 'L'invasione degli storni'.[43] Perspective also reduces wandering human beings with stereoscopic view to the fixed role of cyclops.[44]

Palomar has the reputation of being a human telescope. Nonetheless, his name, the irony of which has been explained by Calvino, is not suited to a myopic character. The different forms of objectivity to which one can strive are not ideally crystallized in Palomar but stumblingly embodied by him. The body is more important than usually acknowledged in the book: in *Palomar* seeing is optics, instances of vision, eyes that watch and that are part of a body,

[38]Panofsky, pp. 67–68; This quote from Panofsky is included in *Enciclopedia Einaudi*, IV (1978), 1098–150 (p. 1105) and *Enciclopedia Einaudi*, XIV (1981), 1121; Calvino wrote a review in *La repubblica* about this specific volume: Italo Calvino, 'Ed ora siamo a zero', *La repubblica*, 19 January 1982.
[39]Calvino, *Palomar*, pp. 15–20, 37. See also the *cosmicomica* 'La spirale', in Italo Calvino, *Tutte le cosmicomiche* (Milan: Mondadori, 1997), pp. 135–49.
[40]Calvino, *Saggi*, pp. 365–66.
[41]Calvino, *Saggi*, pp. 1992, 365; da Vinci, p. 20.
[42]Calvino, *Romanzi e racconti*, III, pp. 1214–15.
[43]'All'interno dello stormo già il signor Palomar distingue una prospettiva [...]. Ma questa illusione di regolarità è traditrice'. Calvino, *Palomar*, pp. 64–65.
[44]Hubert Damisch, *The Origin of Perspective* (Cambridge, MA: MIT Press, 1994), p. 35; Panofsky, p. 31.

environment and mind, not just the disembodied eye of Descartes, nor of a Monsieur Teste who abandons the body.[45] I will return to this aspect in the next section.

Instruments of Observation

> Forse la leopardiana luna di pomeriggio può valere come porta d'ingresso nel tuo mondo tra il cosmicomico e l'individuale, tra il descrivere e l'immaginare. Il Cigoli sotto i piedi di una sua Madonna non dipingeva il semicerchio tradizionale ma la luna astronomica di quel Galileo da te tanto amato: nel cortile di un palazzo mediceo si riunivano alcuni pittori in un anno del Seicento per dipingere a gara il cielo, dei galileiani canocchiali. Queste prove di una ricca e complessa civiltà fiorentina, tra scienza ed arti figurative, mi aiutano ad avvicinarmi a te.[46]

Calvino could find, in Piattelli Palmarini's entry on 'anticipazione' in the *Enciclopedia Einaudi*, an explanation of how to approach 'objectivity'. The main points that are mentioned here are adopted by Palomar: delimit your field of research and don't let your intellect interfere with the practice of observation.[47] Palomar nonetheless shows the impossibility of attaining both an 'innocent eye' and satisfactory delimitation. He discovers time and again that seeing and theory are indissolubly bound together (as underlined also by Michel Serres), just as painting influences seeing: you see what you paint rather than painting what you see (as Gombrich explains).[48]

This ambiguity is intrinsic to some of the most frequently used terms in *Palomar*. 'Disegno', 'quadro', and 'prospettiva' are recurrent words, from the first, one might say programmatic, story 'Lettura di un'onda'.[49] Palomar *reads* the wave as the title states, acknowledging the 'pancryptic' nature of the visible surface of the world. His reading is an ever-frustrated attempt at description, which the author tries to convey through a very technical, scientific use of language, which includes the abovementioned 'disegno', 'quadro' and 'prospettiva'. 'Disegno' in itself can denote something abstract and concrete, both the children's drawing and the skeleton of lines that underlies different structures – a fact that was also stressed in the 'Disegno/progetto' entry in the *Enciclopedia Einaudi*.[50] Calvino's reputation seems to make the abstract reading more readily available but there is no clear reason for the reader to abandon the ambiguity of 'disegno'. A clear indication of Calvino's consciousness of the double semantic possibility inherent in 'disegno' is a phrase from 'L'invasione degli storni', which describes the starlings as composing 'disegni che diventano ora più scuri ora più chiari e alla fine si disfano e lasciano sul foglio bianco una picchiettatura di frammenti dispersi'.[51] Moreover, the idea that Palomar *only* observes is convincingly contradicted by a moment in 'Il museo dei formaggi'. The reference to musea is explicit from the title onwards and at a certain point Palomar 'estrae di tasca un taccuino, una penna, comincia a scriverci dei nomi, a segnare accanto a ogni nome qualche qualifica che permetta di richiamare l'immagine alla memoria; prova anche a disegnare uno schizzo sintetico della forma'.[52] Thereupon, Palomar is depicted drawing various outlines of pieces of cheese, before being brusquely interrupted because it is his turn to order.

From Leonardo onwards, *disegno* has not only been an aesthetic activity but also an instrument of knowledge, an act of ordering the observed world, representing an amalgam of mental and

[45]Marco Belpoliti, *L'occhio di Calvino* (Turin: Einaudi, 1996), pp. 44–45.
[46]Claudio Varese, 'Lettera a Calvino su "Palomar"', *Otto/Novecento*, VIII.5–6 (1984), 193–97 (p. 194).
[47]*Enciclopedia*, I, pp. 626–27.
[48]Michel Serres, 'Panoptic Theory', in *The Limits of Theory*, ed. by Thomas M. Kavanagh (Stanford: Stanford University Press, 1989), pp. 25–50 (p. 27); Gombrich, p. 321.
[49]Calvino, *Palomar*, pp. 5, 66.
[50]*Enciclopedia*, IV, p. 1107; Rudolf Arnheim, *Visual Thinking* (London: Faber and Faber, 1970), pp. 255–70.
[51]Calvino, *Palomar*, p. 66.
[52]Calvino, *Palomar*, p. 76.

external delineation.[53] Again, the use of the same terminology in 'Palomar e Michelangelo' seems to corroborate this. Michelangelo is quoted: 'Talvolta io penso e immagino che tra gli uomini esiste una sola arte e scienza, e che questa sia il disegnare o il dipingere.' The reaction of Palomar is the following: 'Da quando ha letto quella pagina, egli interpreta in quella chiave ogni cosa che vede: sente la responsabilità della forma che il mondo prende intorno a lui, e si sente parte di questa immagine.'[54] This being part of the image is a crucial addition, as it points to the embodied experience of the surroundings which include Palomar himself. Likewise, 'quadro' has a delimitating function that is both abstract and concrete, and has a conceptual connection to the grid, the ordering structure that adorns the cover of the first edition of *Palomar*.[55] The duplicity of the term 'quadro' is most clearly expressed in 'L'aiola di sabbia', in which Palomar explores the 'sguardo interiore', which should rhyme with the 'armonia indefinibile che collega gli elementi del quadro'. This 'quadro' is mirrored in the tourist cameras that 'inquadrano', but also in the temple structure itself: 'possiamo vederlo come un quadro incorniciato dai muri del tempio'.[56] 'Disegno' also recurs in the story, reinforcing the implicit undercurrent of art history and the history of perspective, as well as reiterating the suggestive semantic ambivalence that Calvino knowingly adopts here.

There is, arguably, a subtler link to (Japanese) painting to be discovered: when we read Calvino's essay on Arakawa (published in 1985), we notice that he foregrounds the 'blank', that is the parts of 'non-quadro' in Arakawa's works that reveal the arbitrariness of the borders of the painting and the possibility to extend the 'blank' infinitely into space.[57] This reading of the work of the Kyoto artist can not only be found in the work of Arakawa and Madeline Gins, but also in the books of Norman Bryson, who considers blankness as that which ruptures the gaze, the 'false ontology in which seer and the seen commune in tunnel vision'. It is an

> optic that casts around each entity a perceptual frame, that makes a cut from the field and immobilizes the cut within the static framework. But as soon as that frame is withdrawn, the object is found to exist as part of a mobile continuum that cannot be cut anywhere.[58]

Besides the repetition in 'L'aiola di sabbia' of 'quadro' and 'disegno', already in the first phrase we find the mention of the 'sabbia bianca', which later becomes a 'sabbia incolore'.[59] 'Blank' is precisely a non-colour, a space of possibility, a nothingness that makes existence possible.

The fusion of the hand of the artist and the eye of the scientist (or vice versa) is a constant of scientific practice from Galileo onwards. Much has been written about the fusion of hand and mind, *disegno* and vision, in the scientific practice of Galileo.[60] As Ezio Raimondi writes, the famous *Accademia dei Lincei* (named after lynxes because of their sharp sight) needed the two-edged sword of 'disegno' to effectively study nature:

> Se lo studio della natura esige un occhio mentale che sappia trascrivere fedelmente forme e strutture degli oggetti o degli organismi, il disegno è insieme la premessa e la verifica di ogni «observatio» e procede perciò di pari passo col discorso descrittivo del ricercatore quasi a costituirne il fondamento tecnico, il modello di procedura

[53]Andreina Griseri, 'Il disegno', in *Storia dell'arte italiana*, ed. by Giulio Bollati and Paolo Fossati, 2 vols (Turin: Einaudi, 1980), II, pp. 187–286 (p. 229); Wolfgang Kemp, 'Disegno. Beitrafe zur Geschichte des Begriffs zwischen 1547 und 1607', *Marburger Jahrbuch für Kunstwissenschaft* (1974), 219–40.

[54]Calvino, *Saggi*, p. 1991.

[55]Damisch, p. 101; Calvino knew Damisch from the end of the fifties and quotes Damisch in the *Lezioni americane, Saggi*, p. 712; Edoardo Esposito, *Sul ri-uso: pratiche del testo e teoria della letteratura* (Milan: FrancoAngeli, 2007), p. 90.

[56]Calvino, *Palomar*, pp. 93–96.

[57]Marco Belpoliti, 'Calvino's Colours', in *Image, Eye and Art in Calvino. Writing Visibility*, ed. by Brigitte Grundtvig, Martin McLaughlin and Lene Waage Petersen (London: Legenda, 2007), pp. 12–25.

[58]Norman Bryson, 'The Gaze in the Expanded Field', in *Vision and Visuality*, ed. by Hal Foster (Seattle: Bay Press, 1988), pp. 87–113 (pp. 97, 103).

[59]Calvino, *Palomar*, p. 93. This 'incolore' is missing in the description of the same 'sabbia bianca', in 'La luna corre dietro alla luna', where it even gets a 'luccichio argentato'. *Saggi*, p. 587.

[60]Giorgio de Santillana, 'Galileo tra l'arte e la scienza', in *Rappresentazione artistica e rappresentazione scientifica nel secolo dei lumi*, ed. by Vittore Branca (Venice: Sansoni, 1970), pp. 1–22 (pp. 19–20); Samuel Y Edgerton, 'Galileo, Florentine "Disegno," and the "Strange Spottednesse" of the Moon', *Art Journal*, 44.3 (1984), 225–32; Horst Bredekamp, *Galilei der Künstler. Der Mond, Die Sonne, Die Hand* (Berlin: Akademie Verlag, 2007).

> realistica. […] Proprio per questo gli uomini dell'Accademia dei Lincei […] si preoccupano tanto di avere a disposizione […] degli illustratori e dei ritrattisti, capaci di registrare esattamente le immagini delle cose.[61]

Pietro Redondi, whose *Galileo eretico* Calvino reviewed in 1983, also pays attention to the encyclopedic project (explicitly using the term 'enciclopedia') of the Lincei, their multidisciplinary and surprisingly modern effort at cataloguing and illustrating the book of the universe with a book of their own.[62] Their *Theatrum naturale*, writes Redondi, was introduced by the *Speculum rationis*, which addressed the 'arte dello sguardo e del ragionamento nell'esperienza scientifica'.[63] Giorgio De Santillana, in a longer discussion on Ludovico Cigoli, painter and friend of Galileo, cites Cigoli on the relation of vision to drawing: 'This proves to me again […] that a mathematician however great who does not understand drawing is not only half a mathematician, but indeed a man deprived of sight.'[64] De Santillana, through Cigoli, thus recognizes the importance of visualization even in a mathematical, 'book of the world' worldview.

Even though Calvino writes about Galileo and Leonardo da Vinci mostly in terms of the arduous task of description – considered to have been masterfully handled by the one (Galileo) and in a perceptible battle with language by the other (Leonardo) – he does not forget that both were (more) interested and skilled in the material side of representation, especially drawing and painting.[65] In Calvino's 'Il libro della natura in Galileo', Galileo's interest in and opinions on painting and other forms of art are present in a constant but often disregarded pattern woven into the background of Calvino's reappraisal of the astronomer.[66] In an essay on Galileo and the arts that Calvino may have read in Adriano Carugo's *Galileo* in 1978, Panofsky combines the 'classististic prejudice in favour of simplicity, order, and separation of genres, and against complexity, imbalance, and all kinds of conflation' of Galileo's artistic opinions on Arcimboldo and Cigoli (the same painters that Calvino includes in his later essay) with the broader worldview that underlay his astronomical discoveries.[67]

Although it is unsure what the topic of the planned but then abandoned dialogue between Palomar and Galileo would have been, the moon seems a likely candidate for their discussion.[68] As Calvino himself stressed, Galileo's discovery of spots on sun and moon constituted precisely a 'render conto della singolarità contro ciò che si pretendeva essere la norma'.[69] He has Palomar repeat Galileo's observation of the moon during the day, and describes it in distinctly pictorial terms, for example in this fragment of 'Luna di pomeriggio': 'In mezzo al cerchio le macchie ci sono sempre, anzi i loro chiaroscuri si fanno più contrastanti per rapporto alla luminosità del resto.'[70] This could just as well be the description of one of Galileo's drawings or a painting, especially when combined with the array of colours that is described just before, from 'pervinca' to 'cenerognolo'. Just like Jan Van Eyck, Palomar recreates the moon at the moment when its visibility is least clear, its existence least certain.[71]

The telescope did not resolve our problems in viewing the world; rather, it made them even more tangible. Galileo still had to use images, representations, to convey what he saw through his telescope and thus, like Ariosto, he had to confide in the 're-employment of conventional imagery

[61]Ezio Raimondi, 'La nuova scienza e la visione degli oggetti', *Lettere italiane*, 21.3 (1969), 265–305 (p. 285); David Freedberg, *The Eye of the Lynx: Galileo, his Friends, and the Beginnings of Modern Natural History* (Chicago: University of Chicago Press, 2002).
[62]Calvino, *Saggi*, pp. 2077–84.
[63]Pietro Redondi, *Galileo eretico* (Turin: Einaudi, 1983), pp. 101–05.
[64]De Santillana, *The Role*, pp. 33–34; For a similar quote from Galileo himself: Reeves, p. 12.
[65]For Calvino's relation to the writings of Galileo and a mention of other articles on the topic: Gaspare Polizzi, 'La letteratura italiana dinanzi al cosmo: Calvino tra Galileo e Leopardi', *Lettere italiane*, LXII.1 (2010), 63–107.
[66]Calvino, *Saggi*, p. 853–55.
[67]Erwin Panofsky, 'Galileo as a Critic of the Arts: Aesthetic Attitude and Scientific Thought', *Isis*, 47.1 (1956), 3–15 (p. 9).
[68]Eraldo Bellini, 'Chi cattura chi? Letteratura e scienza tra Calvino e Galileo', *Galilaeana*, 3 (2006), 149–97 (p. 186).
[69]Calvino, *Saggi*, pp. 2032–33.
[70]Calvino, *Palomar*, p. 36.
[71]Roberta J. M. Olson and Jay M. Pasachoff, 'Moon-Struck: Artists Rediscover Nature and Observe', *Earth, Moon and Planets*, 85–86 (2001), 303–41 (p. 308).

in the fabrication of new fictions'. The telescope problematizes sight instead of making it more 'objective', calling attention to that which can be seen but certainly also to the much greater parts that are left unseen and to the fallibility of the senses.[72] Giorgio de Santillana similarly reminds his readers that the telescope was at first called 'perspicillum', and seen as 'one more "perspective instrument"'.[73] This outlook is also evident in Palomar's struggle with the telescope in 'L'occhio e i pianeti', which places greater emphasis on that which is lost to Palomar than on what he manages to perceive. He tries to 'attenermi a ciò che vedo' – a quote often removed from its context to become a somewhat simplistic programmatic sentence for Palomar – but his eyes register oscillations, they get tired, the image is blurred, Palomar's imagination further removes him from objective vision and his efforts are continuously frustrated.[74] This does not necessarily make him *only* a Chaplinesque or Keatonesque character, doomed to failure because of his faults and imperfections: he can be viewed also as an embodiment of the aprioristically impossible scientific and artistic endeavour (Giovanni Schiaparelli and Domenico Cassini are mentioned in the story) to see beyond our prejudices and imagination, paradigms and schemata.

What is often obscured in readings of *Palomar* is that most of the time Palomar does *not* see the world as if from behind a telescope. The one time that he uses the telescope he shows that this is not his natural habitat and that he does not have the trained eye and trained judgment which are necessary for scientists and artists to see clearly.[75] The indications of Palomar's problems with seeing, and his bodily inconveniences, point to the physicality, the non-mechanic nature of contemplating the stars. This arduous task has been performed by many astronomers before Palomar, and even long after the invention of the telescope the impediments and obstacles which are described in Palomar still hold true, as can be seen for instance in William Herschel's tireless perfecting of his 'art of seeing'.[76] An important difference between the telescopic view, 'un illusorio faccia a faccia', and the view 'a occhio nudo' is explained in the Palomarian 'L'occhio e i pianeti': 'la grande differenza è che qui [i.e., in the second case] è obbligato a tener conto delle proporzioni tra il pianeta, il resto del firmamento sparso [...] e lui che guarda'.[77] Galilei, who also writes about the difference between seeing with and without a telescope in his *Saggiatore*, observes:

> ben sento tirarmi dalla necessità, subito che concepisco una materia o sostanza corporea, concepire insieme ch'ella è terminata e figurata di questa o di quella figura, ch'ella in relazione ad altre è grande o piccola, ch'ella è in questa o quel luogo (...) ch'ella è una, poca o molta.[78]

Relations are established of necessity by those who pertain to a visual *world*, with eyes that move around and are not artificially fixed upon a visual *field*.[79]

Scientific instruments and representations tend to make a visual field out of a visual world, to delimit and freeze the object of research and make it available for study. Palomar behaves, however, 'come tutti gli esseri viventi che sono in grado di spostarsi': 'fa rotare le pupille [...] torce il collo', as can be read in 'Dietro il retrovisore', a story not published in *Palomar* but which specifically addresses the relation of Palomar to instruments that help him see what he otherwise could not. Palomar here recognizes that 'abbolita l'immagine l'io diventa un occhio immateriale come un punto sospeso sul mondo', a possible scientific ideal, but impossible for Palomar to attain

[72]Lambert, pp. 8–9, 28, 34; Massimo Bucciantini, Michele Camerota and Franco Giudice, *Il telescopio di Galileo. Una storia europea* (Turin: Einaudi, 2012).
[73]De Santillana, 'The Role', p. 36.
[74]Calvino, *Palomar*, pp. 39–43.
[75]Gombrich, pp. 155–75; Daston and Galison, p. 46.
[76]Richard Holmes, *The Age of Wonder: How the Romantic Generation Discovered the Beauty and Terror of Science* (London: Harper Press, 2011), pp. 108, 115–17.
[77]Calvino, *Palomar*, pp. 42–43.
[78]Galileo Galilei, *Il saggiatore* (Milan: Feltrinelli, 1965), p. 261.
[79]Bordo, pp. 64–65.

if not in short epiphanic flashes, which are immediately occasion for new doubts to arise.[80] In 'Il mondo guarda il mondo', we find the explicit reflection: 'ma come si fa a guardare qualcosa lasciando da parte l'io? Di chi sono gli occhi che guardano? Di solito si pensa che l'io sia uno che sta affacciato ai propri occhi come al davanzale d'una finestra.'[81] Palomar casts a mobile glance more often than he carries off a fixed gaze.[82] This is not to say that he does not strive for a fixed gaze but the moment always arrives when his eyes move away again (inwardly or outwardly), as in the following sequential examples from 'L'invasione degli storni': 'Se si sofferma per qualche minuto a osservare', 'Ma basta che egli si metta a seguire con lo sguardo', 'porta lo sguardo su un uccello che invece si sta allontanando e da questo su un'altro [sic] che s'allontana anch'esso', 'Ma gli basta volgere gli occhi verso un'altra zona'.[83] That which moves makes Palomar's eyes move with it, and even when the object does not move (such as in 'Il prato infinito') his eyes wander restlessly and without resolution.[84] While the author may be sedentary and possess a gaze that can produce a photograph's stillness, his protagonist is certainly an ambulant character, somewhat like the ambulatory observer of Walter Benjamin's modernity instead of an accomplished contemplative beholder.[85]

The interrogation of the notion of perspective and its relation to objective or subjective vision is evident in 'La spada del sole', the Berkeleyan influence of which has been noted by several critics.[86] Another interesting, somewhat more indirect interrogation of the role of viewpoint and perspective in vision is to be found in the first story of *Palomar*, 'Lettura di un'onda'. Just as 'Il prato infinito' has been read in light of chaos theory, in this case we can move beyond the ocean's waves to consider the role of waves in the changes that have occurred in twentieth-century science: it is precisely the wave-theory of light that 'made obsolete the notion of a rectilinear propagation of light rays on which classical optics and, in part, the science of perspective was based'.[87] Palomar recognizes that the right external and internal conditions are necessary for his experiment of seeing a wave. From his 'punto d'osservazione', however, he finds it impossible to 'limitare il suo campo di osservazione', 'fissare i limiti' and immobilize the expanse that he has in front of him, to separate one wave from the others. He tries to create the appropriate 'quadro', on the beach that takes 'a modello il disegno delle onde', to put together an 'immagine'. He tries to 'semplicemente vedere', but the sentences that follow this aim make clear that this is out of reach.[88] This is evident already from the fact that 'semplicemente' needs to be qualified, followed by a 'cioè' that in its short simplicity syntactically and semantically counterbalances the declared ease of the act of seeing. What follows are other qualifications and specifications. Between future and past, mind and eye, the act of actually seeing with an innocent eye, in the present, is depicted as a fata morgana, through the accretion of various linguistic barriers and borders.

Calvino here, over the head of Palomar, practices writing as description, and the piece could be added to the description section of the anthology for high schools that Calvino co-edited in 1969. It recalls the descriptions of Leonardo da Vinci, which Calvino himself discussed with interest on

[80]Calvino, *Romanzi e racconti*, III, pp. 1160–61.
[81]Calvino, *Palomar*, p. 116; Gombrich also states that 'the innocent eye sees nothing', cited in *Enciclopedia*, I, p. 651; Calvino himself writes already in the early story 'L'occhio del padrone': 'Ma a che serve un occhio, solo un occhio, staccato da tutto? Non vede nemmeno'. Calvino, *Romanzi e racconti*, I, p. 195.
[82]Martin Jay, *Downcast Eyes: The Denigration of Vision in Twentieth-Century French Thought* (Berkeley: University of California Press, 1993), p. 56.
[83]Calvino, *Palomar*, p. 65.
[84]Calvino, *Palomar*, pp. 30–32.
[85]For a passage, published posthumously, about the relation between writing, description, painting and sitting still, see 'Ipotesi di descrizione di un paesaggio', in Calvino, *Saggi*, pp. 2693–94.
[86]Wallace, p. 276; Antonello, p. 212.
[87]Jonathan Crary, *Techniques of the Observer: on Vision and Modernity in the Nineteenth Century* (Cambridge, MA: MIT Press, 1990), p. 86; For *Palomar* and chaos theory, Pilz, 66–67; Floyd Merrell, *Simplicity and Complexity: Pondering Literature, Science and Painting* (Ann Arbor: The University of Michigan Press, 1998), pp. 58–71, 74–77.
[88]Calvino, *Palomar*, pp. 6–9.

several occasions.[89] Leonardo painted the seas in stormy circumstances, and in painting he reached a much greater clarity of language than in writing, as Calvino also acknowledges.[90] The possible convergence of painting and science in a seashore context is, moreover, recognized by Calvino when he writes about Galilei's description of a sunset above the sea: 'mai vi fu immagine più spesso rappresentata da pittori'.[91]

Animals and Plants in Museum and Zoo: The Unseen and the Encyclopedic Drive

Palomar not only observes natural phenomena but also many animals. In these encounters, the histories of scientific and artistic observation are again subtly woven into the tapestry of Calvino's narration. Palomar finds himself caught between two extremes that Carlo Ginzburg described in an essay which Calvino reviewed: 'A questo punto si aprivano due vie: o sacrificare la conoscenza dell'elemento individuale alla generalizzazione [...] o cercare di elaborare, magari a tentoni, un paradigma diverso imperniato sulla conoscenza scientifica (ma di una scientificità tutta da definire) dell'individuale.'[92] Calvino calls precisely for such a *mathesis singularis*, and Palomar seems to be searching in the folds of this epistemological divide. In the once dominant epistemological mode of 'truth-to-nature', the ideal animal or plant was more important than the specific, individual specimen upon which one laid one's eye. Seeing this uniqueness is a new scientific possibility offered by 'blind vision', by confronting reality with an unprejudiced eye.[93]

Palomar repeats the experience of many naturalists who are faced with newness, with animals they have never seen before. In his 1976 essay 'Com'era nuovo il Nuovo Mondo', Calvino writes about explorers and painters who were faced with new worlds but could not see them because of the pre-established schemata in their heads. In theory, throughout history we have developed a capacity for observation that is ever more precise and objective, and a keener eye for the uncommon and un(fore)seen. 'Ma sarà davvero così?', Calvino rebuts rhetorically, 'I nostri occhi e le nostre menti sono abituati a scegliere e a catalogare solo ciò che entra nelle classificazioni collaudate.'[94] Similarly, Gombrich explains with reference to the example of Dürer's famous rhinoceros and its influence in art history the inevitability of the interference of imagination on the practice of viewing.[95] Calvino mentions painters, such as John White and Albert Eckhout (both of whom famously painted turtles), and others whose images at the Pompidou Centre exhibition in Paris inspired this piece.[96] It should not be forgotten that Calvino's parents made a similar journey many decades later, studying plants in Cuba, and published an illustrated volume of botanic tips in 1940.[97]

Palomar encounters many animals in the zoo, most of the time in Paris' Jardin des Plantes or at another zoo in Paris (Vincennes), and on one occasion at Barcelona zoo. Palomar tries to study these animals with a scientific mindset: this is stressed several times when Calvino explicitly mentions the glass that separates Palomar from the animals as well as the frame through which he sees. But the setting itself is important too: the *Jardin des Plantes* is not only an old and very established zoo, the history of which encompasses an important chapter in our dealings with exotic animals, but also a zoo with several museums on site, where the scientific study of animals

[89] *La lettura: antologia per la scuola media*, ed. by Italo Calvino and Giambattista Salinari (Bologna: Zanichelli, 1969), p. 180; Calvino, *Saggi*, p. 1404.
[90] Calvino, *Saggi*, p. 694.
[91] Calvino and Salinari, p. 183; da Vinci, p. 298.
[92] Carlo Ginzburg, *Miti, emblemi, spie: morfologia e storia* (Turin: Einaudi, 1986), p. 171; Calvino, *Saggi*, pp. 2031–37.
[93] Daston and Galison, p. 42; Florike Egmond, *Eye for Detail: Images of Plants and Animals in Art and Science, 1500–1630* (London: Reaktion Books, 2017), pp. 128–29.
[94] Calvino, *Saggi*, pp. 417–18.
[95] Gombrich, p. 81.
[96] Calvino, *Saggi*, pp. 421–23; The exhibition volume is *L'Amérique vue par l'Europe: [exposition], Grand Palais, 17 septembre 1976–3 janvier 1977*, ed. by Hugh Honour (Paris: Éditions des musées nationaux, 1976).
[97] Mario Calvino and Eva Mameli Calvino, *250 quesiti di giardinaggio risolti* (Rome: Donzelli, 2011).

was regularly practiced from an early stage. Frequenters of the Jardin des Plantes included scientists like Georges Cuvier (this is mentioned by Calvino in an essay elsewhere), who was amongst the pioneers of the study of animal behaviour and known for his 'detailed paintings of plants and animals'.[98] Artists were also drawn to zoos in order to study and depict nature as never before. As Dürer stated long before zoos came into existence: 'Therefore look closely at it, take it as your guide and do not depart from nature [...]. For truly: art is rooted in nature, if you can draw it out it will be yours.'[99] There is thus also a clear element of possession to this dialogue with nature, which is more emphatically and architecturally captured in the zoo-environment. Artists like Pierre-Joseph Redouté became assiduous frequenters of the *Jardin des Plantes* and acquired a reputation for their exquisite botanical drawings. But also an unlikely candidate such as J. J. Grandville (a relatively neglected source of inspiration for the *Cosmicomiche*) refers to the Jardin des Plantes in several of his fantastic animal drawings.[100] It should be added that amongst the materials of Calvino for the stories on the five senses (three of which were published posthumously as *Sotto il sole giaguaro*), there is an annotation on Georges-Louis Leclerc de Buffon, renowned for his profusely illustrated encyclopedic project on natural history but also a very important figure in transforming the Jardin des Plantes into a research centre and museum.[101]

Calvino was clearly fascinated by the compound of the fantastic and the concrete, and the way these poles are inextricably interlaced. Taxonomy can also be operative in the case of creatures born from fantasy – this is a constant even in the early modern bestiary tradition.[102] From the appearance of lesser known and fantastic animals in Pliny, to Borges' *Manual de zoologia fantastica*, to Luigi Serafini's *Codex seraphinianus* – a bewildering tetramorphic catalogue of fantastic animal-plant admixtures – and Edward Lear's *Nonsense Botany*, Calvino incorporates such cross-pollinations in several instances in his essays.[103] The publications of Franco Maria Ricci, whom both Borges and Calvino knew well, presumably provided a great stimulus for Calvino. Serafini's volume, for example, was published by Ricci with an introduction by Calvino, while Ricci's own volumes (like his successful magazine) almost always include numerous illustrations, exploring the crossroads between writing and image.

In 'L'ordine degli squamati' Calvino foregrounds both the fantastic and the taxonomic in Palomar's zoo-ambulations. He has Palomar wander in a warm atmosphere with a penetrant smell, an atmosphere which is not conducive to distant, 'cold' gazing. On the one hand, the reptiles have 'parvenze di drago' and form a 'bestiario antidiluviano', a sort of 'ipotesi della mente, un prodotto dell'immaginazione'. On the other hand, however, Palomar seems to have in front of him the pages of a *naturalis historia*, in the 'fila di gabbie-vetrine dello zoo', a 'campione', 'campionario', 'ordine'.[104] In spite of the apparent order, the different animals remain unique, with traits of individuality, such as complex, evolved, layered eyes that unsettle the subject-object relation even in an observational, instrumental context. In their uniqueness the reptiles disrupt a possible truth-to-nature catalogue of idealized forms without exceptions and ask to be confronted directly, in the present, eye-to-eye.[105] This holds true for several of the animals that Palomar encounters at the zoo and most emphatically for the visibly unique albino gorilla Copito de Nieve. As Robert P. Harrison writes of Palomar's encounter with Copito de Nieve, the animal represents

[98]Geoff Hosey, Vicky Melfi and Sheila Pankhurst, *Zoo Animals: Behaviour, Management and Welfare* (Oxford: Oxford University Press, 2013), pp. 18–19; Calvino, *Saggi*, p. 954.
[99]Charlotte Sleigh, *The Paper Zoo: 500 Years of Animals in Art* (Chicago: University of Chicago Press, 2017), p. 12.
[100]Italo Calvino, 'Le Cosmicomiche', *Il Caffè*, 4 (1964), 40; Sergio Cappello, *Les années parisiennes d'Italo Calvino (1964–1980): sous le signe de Raymond Queneau* (Paris: Presses de l'Université Paris-Sorbonne, 2007), pp. 85–88, 103–04.
[101]Calvino, *Saggi*, p. 1215.
[102]Egmond, pp. 68–74.
[103]Calvino, *Saggi*, pp. 198, 476, 558, 928–29; *Romanzi e racconti*, III, p. 1160; Edward Lear, *Nonsense Botany and Nonsense Alphabets etc. etc.* (London; New York: Frederick Warne & Co, 1901); Jorge Luis Borges, *Manual de zoologia fantastica* (Mexico: Fondo de Cultura Económica, 1957); Luigi Serafini, *Codex seraphinianus* (Milan: Franco Maria Ricci, 1981).
[104]Calvino, *Palomar*, pp. 85–89.
[105]Carrie Rohman, 'On Singularity and the Symbolic: The Threshold of the Human in Calvino's *Mr. Palomar*', *Criticism*, 51.1 (2009), 63–78.

the idea that 'Every individual is an "irreducible species unto itself". Copito de Nieve, one could say, is at the threshold of becoming such a *species infima*.'[106]

In other instances Palomar seems to come closer to obtaining the conditions of Dürer's attempt at objectively rendering a crab: 'The internal variables – psychological and social – are limited by the choice of an object that generates a minimum of emotional and conventional "noise" such as feeling, fear, respect, or contempt.'[107] An interesting counter-example to the study of reptiles in the zoo is provided in 'La pancia del geco', in which Palomar looks at a gecko, the eyes of which cannot be seen. The gecko is pressed against the window (producing a two-dimensional glass square and a fixed image of a sample, as if under a microscope), and both the gecko and Palomar sit relatively still. Because of the combined conditions of the light and the glass, Palomar can not only look at part of the gecko instead of at the whole animal, he can even see inside the gecko, with a penetrating gaze. This image may be readily understood to represent a form of X-ray gaze – as Calvino himself writes, 'illuminato è trasparente come ai raggi X' – which produces recognizable skeletal lines and patterns inside animals and humans, 'una macchina elaboratissima studiata in ogni microscopico dettaglio', codifying a new structural grid for twentieth-century science.[108] In the end, however, movement threatens to break the canvas again, in the form of Palomar's erring thoughts and the fly that draws the eye of the gecko.

Similarly, in 'Gli amori delle tartarughe' the setting seems promising for scientific study as suggested by the phrasing: 'Le osserva con un'attenzione fredda, come se si trattasse di due macchine.'[109] The gaze betrays the minimum of emotional noise mentioned above; it is the cold gaze of the zoologist that Calvino describes in similar terms elsewhere.[110] However, this 'emotional noise' is not at all silenced in Palomar, who starts to imagine what it would be like to be a turtle in love. A likely source for Calvino's story (as well as for the story 'Priscilla' from *T con zero*) is the *Bestiaire d'amour*, in which Jean Rostand elaborates scientifically on *eros* in all its forms, from cells to animals, explicitly making comparisons with human beings, and adding drawings of copulating turtles.[111] Turtles are, more generally, privileged 'interlocutors' for Palomar, as for Calvino who also penned a 'Dialogo con una tartaruga'.[112]

Just as the turtles painted by Eckhout and White were mentioned by Calvino, so too so we can read in another his essays that the arrival of the first giraffe in Paris occasioned many artistic depictions.[113] As in the case of the gecko and the turtles, the term 'macchina' is used in Palomar's reflections on the peculiar shape and movement of the giraffes in 'La corsa delle giraffe'. At the same time, however, the giraffes are consistently described in pictorial terms: 'disegno', 'quadrare', 'macchie', 'figure', 'equivalente grafico' and 'pigmentazione' are some of the terms employed to describe them.[114] The choice of the giraffe is, again, not coincidental. Calvino's awareness of the importance of the giraffe in the evolutional theories of Lamarck and Darwin has already been pointed out by Lawrence Venuti, who singles out an untranslated phrase from the *Cosmicomiche* relating to the 'giraffa allampanata in mezzo alla vegetazione ancora bassa'.[115] Philip Prodger has highlighted Darwin's interest in photography and art, stressing as well that lesser known works by

[106]Robert P. Harrison, 'Toward a Philosophy of Nature', in *Uncommon Ground: Rethinking the Human Place in Nature*, ed. by William Cronon (New York: Norton, 1995), pp. 426–46 (p. 431).
[107]James S. Ackerman, 'Early Renaissance, "Naturalism" and Scientific Illustration', in *Distance Points: Essays in Theory and Renaissance Art and Architecture* (Cambridge, MA: The MIT Press, 1991), pp. 185–210 (p. 188).
[108]Calvino, *Palomar*, pp. 60–61. In 'Il marmo e il sangue', Palomar sees a 'carta geografica', a 'mappa' of the 'intera anatomia' of an ox hanging in the butcher's shop (p. 78), while the gecko-story of *Palomar* is included in *Eyewitness to Science*, ed. by John Carey (Cambridge, MA: Harvard University Press, 1997), pp. 395–97.
[109]Calvino, *Palomar*, p. 22.
[110]Calvino, *Saggi*, p. 954.
[111]Jean Rostand, *Bestiaire d'amour* (Paris, 1958), pp. 126–27.
[112]Calvino, *Romanzi e racconti*, III, pp. 1155–58.
[113]Calvino, *Saggi*, p. 459.
[114]Calvino, *Palomar*, pp. 80–81.
[115]Lawrence Venuti, *Translation Changes Everything: Theory and Practice* (New York; London: Routledge, 2013), p. 52.

Darwin include many images.[116] The first scientific book to make extensive use of photographs, alongside other images, is in fact Darwin's *The Expression of the Emotions in Man and Animals*, a work regarded by Calvino as 'bellissimo'.[117]

This interest in the peculiar physiology of the giraffe may also have been heightened by an illustrated article published in the *Scientific American*, which included Calvino among its subscribers.[118] It is important to point out that Palomar's observations are not of an animal at rest or immobilized for study but are instead of a 'cameleopard' in movement, of an animal that seems composed of several animals and several parts that move as if unrelated and unattached.[119] If viewed in juxtaposition to the lion in *T con zero*'s title story – the only available photographic frames of which correspond to specific moments in time – one might wonder if Calvino had encountered the example of Eadweard Muybridge's (or Etienne Jules Marey's) influential chronophotography, where the 'movimento amimale e umano' was 'fissato per la prima volta con un rigore e una precisione che la pittura e la scienza avevano invano e a lungo inseguito'.[120]

Absences in Palomar

The scientific influence on Palomar is clearly visible but nonetheless not straightforward. Palomar's eyes move too much to produce a truly stable gaze and his use of instruments is more metaphoric than real. Except for one instance in which he uses a telescope (a use which, as we have seen, is problematic, because Palomar himself is definitely *not* a telescope, contrary to what is often written) and X-rays, Palomar does not use instruments. This is less self-evident than it seems: for such a purportedly scientific figure, the lack of mechanical tools in Palomar is intriguing. Palomar may often be discussed in the context of microscopes and telescopes, but he almost never uses them. The same goes for brush and pencil, or the Dürerian grid. Others take photographs, mechanically and 'objectively' catching the world in seemingly perfect, instrumental pictures, cut off from time. But Palomar is in fact bothered by the cameras and does not use them himself. He focuses instead (in 'L'aiola di sabbia') on the 'blanks', the interstices, that transcend the artificial frames and borders.[121]

Many critics concord that *Palomar* is a book that has silence at its core: much is elliptically left unsaid. But the silence that Calvino conveys in *Palomar* is not an empty silence, it is a continuation of discourse in a different idiom. Palomar's dialogue with the world happens in ways that are not necessarily mediated by words: as a book, *Palomar* is the product of selection and distillation, and the words that are left have blank spaces between them as their natural surroundings. In such a book, it is even more important to include the unsaid in the hermeneutics of reading, to establish a dialogue with what contributes to the form of the book without being literally legible. Part of this silent core is, in my view, the way in which observation and depiction unite the histories of art and science, the protagonists of which were often involved in a twofold practice that cannot be neatly separated. Palomar retraces this history in his nervously mobile and imperfect manner, reflecting and retracting, finding animals and plants, seas and skies, musea and encyclopedia as his interlocutors and instruments.

[116]Philip Prodger, *Darwin's Camera: Art and Photography in the Theory of Evolution* (Oxford; New York: Oxford University Press, 2009), p. 144.
[117]Calvino, *Saggi*, p. 1668; Calvino cites the recent 1981 *Boringhieri* edition, but *Longanesi* had already published the volume in 1971, under the title *Il meglio in antropologia*. Calvino knew the editor of this edition, Giorgio Celli.
[118]James V. Warren, 'The Physiology of the Giraffe', *Scientific American*, 1 November 1974, 96–102; 'La corsa delle giraffe' is the first *Palomar* to be published, on 1 August 1975; another piece published a couple of months later, 'Palomar e i modelli cosmologici', explicitly mentions the *Scientific American*. Calvino, *Saggi*, p. 2009.
[119]Sleigh, p. 56.
[120]*Enciclopedia*, XIV, 1126; *Enciclopedia*, IX (1980); Costa, pp. 51–55; Aaron Scharf's *Art and Photography* (which discusses Muybridge extensively) was published by *Einaudi* in 1979.
[121]Calvino, *Palomar*, p. 94.

In his obituary for Roland Barthes, Calvino quotes Barthes on the 'mathesis singularis': 'In questo dibattito tutto sommato convenzionale tra la soggettività e la scienza, arrivavo a quest'idea bizzarra: perché non ci potrebbe essere, in qualche modo, una nuova scienza per ogni oggetto. Una *Mathesis singularis* (e non più *universalis*)?'[122] In *Palomar* Calvino seems to suggest that this quest for a science of every object, a fragmented science of that which meets the eye, is not that new: it is a centuries-old quest that unites the history of science and the history of art.

[122]Calvino, *Saggi*, pp. 26–27.