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# Taking Flight: Leonardo's Childhood Memories

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Writing in such detail as this about the kite seems to be my destiny, because in my first childhood memory it seemed to me that, while I was in my cradle, a kite came to me and opened my mouth with his tail and beat me with this tail many times inside my lips.[1]

This passage, one of the very rare personal statements among the enormous quantity of Leonardo's surviving notes and his only documented childhood memory, became notorious after Sigmund Freud's case study of 1910, a landmark in the psychoanalysis of historical individuals (cf. Fig. 1). Freud's interpretation was an effort to understand the scandal of an artist's (Leonardo's) scientific interests as a result of the absence of a father and the transgressive love of a mother. In his astute critique of Freud, written almost half a century later, Meyer Schapiro tried to explain Leonardo's memory with reference to a widespread topos of divine talents and heavenly vocation.[2] Pliny the Elder, for instance – whose *Natural History* was part of Leonardo's library – reports that a nightingale came to rest on the mouth of the sleeping

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1. "Questo scriver sì distintamente del nibio par che sia il mio destino perché ne la prima ricordatione della mia infantia e' mi parea che essendo io in culla che un nibbio venissi a me e mi aprissi la bocha cholla sua coda e molte volte mi percotessi con tal coda dentro alle labbra": Codex Atlanticus, fol. 186v.

2. Meyer Schapiro, "Leonardo and Freud: An Art Historical Study", *Journal of the History of Ideas*, XVII, 1956, pp. 147–178.

child Stesichorus; later on, he became a famous poet.[3] In *The Golden Legend* of Jacopo da Varazze (Jacobus de Voragine), bees fly into the open mouth of the sleeping little Ambrose and then back into the sky: for his father, this was a prophecy about the great future of the boy, who was to become bishop of Milan.[4] However, Leonardo's narration alters the topos of the infant prodigy significantly. The boy is not sleeping. The event has an imperative character and a self-referential core: the touch of the kite determines Leonardo's fate to write about the bird. And it is the tail of the bird that touches him; more exactly, it is the tail that opens his mouth in the first place.

The sexual dimension of the event is evident however we interpret it.[5] But if we don't limit ourselves to the psycho-biographical dimension of this complex text,[6] we can expand our scope. To begin with, the rather aggressive action of the bird forces Leonardo almost inevitably ("il mio destino") to write about the animal. And he obeys. Around 1505, when Leonardo resumes his studies of the flight of birds, the kite plays a very special role. The "childhood memory" can be found on one of the folios dating to this period. No other bird features more prominently in Leonardo's notebooks. Schapiro has observed that, for Leonardo, the kite is a virtuoso among birds. And the most fundamental reason for this is the bird's tail, already for Pliny the Elder nature's paradigm for human navigation.[7] Leonardo writes:

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3. Pliny the Elder, *Natural History*, X.43.

4. Jacobus de Voragine, *The Golden Legend*, trans. Granger Ryan and Helmut Ripperger, I, New York 1941, p. 25.

5. Daniel Arasse, "Léonard et la 'culla del nibbio'. Pour une approche historique du 'souvenir d'enfance'", in *Symboles de la Renaissance*, III, Paris 1990, pp. 61–69, 226–229 (with an avalanche of rather loosely connected associations).

6. On the plausibility of a real event in Leonardo's childhood, see, for instance, Carlo Pedretti, "Il 'bello spettacolo'", *Achademia Leonardi Vinci*, V, 1992, pp. 163–165. For a possible relationship to the death of Leonardo's father on 9 July 1504 (Codex Arundel, fol. 272r), and the medieval *Sogno di Daniello* (printed in Bologna in 1487 and 1491), a treatise on dreams owned by Leonardo (compare Madrid Codex, II, fol. 3r), where dreaming about the kite signifies the death of parents, see James Beck, "The Dream of Leonardo da Vinci", *Artibus et Historiae*, XIV, 1993, pp. 185–198; also, most recently, with hypotheses about Leonardo's relationship to his parents, Carlo Vecce, "Per un 'ricordo d'infanzia' di Leonardo da Vinci", in *Studi di letteratura italiana in onore di Claudio Scarpati*, ed. Eraldo Bellini, Maria Teresa Girardi, and Uberto Motta, Milan 2010, pp. 133–150.

7. Pliny the Elder, *Natural History*, X.12.

> When the kite in descending turns itself right over and pierces the air head downwards, it is forced to bend the tail as far as it can in the opposite direction to that which it desires to follow; and then again bending the tail swiftly, according to the direction in which it wishes to turn, the change in the bird's course corresponds to the turn of the tail, like the rudder of a ship which when turned turns the ship, but in the opposite direction.[8]

But why is Leonardo predestined by the mysterious event in his early childhood to write about the kite?[9] Why does he refer to one of the most sublime topoi of vocation and talent only to transform his practical interest in ornithology into a 'fate'? To answer this question, we must look more closely at Leonardo's studies of the flight of birds, and, in particular at their inseparable link to Leonardo's projects for a flying machine. An apparatus like the ornithopter found in Manuscript B of the Institut de France in Paris, fol. 80r, is a paradigm for the earliest stage of Leonardo's project, dating from about 1490 (Fig. 2). An enormous dish functions as the base of the flying machine. Ladders almost eight meters high lead to hatches that provide access to it. Inside the dish, we find a mechanism consisting of cranks, cylinders, foot pedals, and pulleys that are supposed to set four very large wings, each roughly 24 meters long, in flapping motion. The motor of the whole apparatus is the pilot, whose feet work the pedals while his arms crank the handles and who with his head acts as a living piston. The drawing and the text focus exclusively on the problem of generating the force needed to lift the monster off the ground.

Completely absorbed by the restless activity of his entire body – including his head – the pilot of this flying machine is unaware of his surroundings, and the huge dish further obstructs his sight below.

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8. Manuscript L 62r (Institut de France, Paris); *The Notebooks of Leonardo da Vinci*, trans. Edward MacCurdy, I, New York 1958, p. 489.

9. This is the question of Giuseppina Fumagalli (*Eros di Leonardo*, Milan 1952, pp. 5–17), but her tentative answer – the investigation of nature as a painful dialectics of revelations (the opening of the mouth) and castigations (the beating by the tail) – remains somewhat vague. According to Beck (as in n. 6), the "dream" is centered on the necessity to moderate sexual desire.

Moreover, it is impossible to navigate the vehicle: the colossal contraption is supposed only to take off or descend.

When he resumes his work on the flying machine around 1505, Leonardo changes project. The flying machine is transmuted into an artificial bird and its engineer into an ornithologist. In a significant thematic shift within a single manuscript (the Turin Codex on the flight of birds), Leonardo almost completely abandons his hope of creating enough power to move the wings of his machine.[10] Instead, he acknowledges that the airplane can only imitate (in gliding flight) the bird's balance in the air ("bilicarsi").[11] On the basis of these findings, Leonardo develops an older idea of a glider whose functionality was impressively proven around 1990 (Fig. 3).[12]

Leonardo, however, now concentrating all his considerations and observations on a single species, the kite, the virtuoso of flight without flapping its wings ("sanza...battimento d'alie"),[13] quickly realizes that there was one decisive detail missing in his flying apparatus: the bird's tail. In Leonardo's view, the tail (and to a lesser degree the small so-called *alula*, or bastard wing) is paramount in preventing the bird from tilting, looping, and eventually capsizing. This is exactly the reason why the manuscripts around 1505 – the time of the account of his childhood memory – abound with observations on the kite's tail ("coda del nibbio"; Fig. 4). It is important in this context, that, for Leonardo, the bird's tail is not only the main element of navigation, but also a lever that protects the bird against the powerful thrust during landing. As he underlined also in later manuscripts, the tail's force has to counterbalance more than just the bird's weight (Institut de France, Manuscript E, fol. 53r). This is why the bird during landing spreads its wings and its tail very wide

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10. On the development of Leonardo's studies for the flying machine and on the few references to flapping flight after 1505, see DOMENICO LAURENZA, *Leonardo on Flight*, Baltimore 2004, esp. pp. 70–88 and 106–107.

11. Compare Codex Atlanticus, fol. 434r: "A bird is an instrument working according to the mathematics of natural law. It is within the capacity of man to reproduce all the movements of this instrument, but not with the same strength, being limited only to the balancing movements" (LAURENZA [as in n. 10], pp. 84–86).

12. Compare MICHAEL PIDCOCK, "The Hang Glider", *Achademia Leonardi Vinci*, VI, 1993, pp. 222–225.

13. Compare for instance Arundel Codex, fol. 273v.

("grandissimamente"; Institut de France, Manuscript G, fol. 63v). Only the tail compensates for the "furor" and the "impetus" of the landing bird (Turin Codex, fol. 7r).

In the second phase of this most obsessive technical project, Leonardo is no longer concerned with the overcoming of gravity but with the stabilizing of his glider and, most importantly, its successful landing. Whereas, in Manuscript B, fol. 74v, Leonardo reminds himself to test the "bird" ("uccello") over a lake to prevent any harm to the pilot, in his Turin Codex he recommends that the aeronaut be wrapped in special protective gear with many small cushions, linked up "like the beads of a rosary" ("a uso di pater nostri"; fol. 16r). This should be enough to blunt the impact of a fall from thirteen feet. Quite significantly, already in the first Madrid Codex of ca. 1495 Leonardo had sketched a device to absorb shocks and linked it implicitly, on the same page, to another contender with gravity, Simon Magus.[14] As we will see, the religious references in both cases are not coincidental.

The kite also appears in Leonardo's animal fable on Envy (*Invidia*), an elaboration of a passage in the so-called *Fior di virtù*, an early fourteenth-century treatise on virtues and vices which he owned: "We read about the kite, who, as soon as it notices that its chicks are becoming too fat, picks flesh from their flanks and leaves them without food."[15] Placed in this context, Leonardo's childhood memory reveals its unambiguously negative core, as a tale of *paragone*, scorn, and resignation. It is not enough to read this memory simply as a figuration of "the characteristic movement of the tail against the wind and the currents of air of which the breath is a counterpart".[16] The kite, the emblem of envy, thrusts his marvelously

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14. "Della natura della percussione. Allegando la caduta di Simon Mago, e d'uno che salta sulle punte de' piedi": Madrid Codex, I, fol. 62v.

15. Institut de France, Manuscript H, fol. 5v. See also Edmondo Solmi, *Le fonti dei manoscritti di Leonardo da Vinci. Contributi* (1908), reprint in *Scritti vinciani*, Florence 1976, p. 157. On the relationship to Leonardo's allegorical drawing of *Virtue and Envy* in Oxford (Christ Church, no. 0037v), see Alessandro Nova, "The Kite, Envy and a Memory of Leonardo da Vinci's Childhood", in *Coming About... A Festschrift for John Shearman*, ed. Lars R. Jones and Louisa C. Matthew, Cambridge, Mass. 2001, pp. 381–386.

16. Schapiro (as in n. 2), p. 152.

agile tail tauntingly into the mouth of the young boy who, as an adult, will praise the tail of the bird exuberantly in *words* without being capable to imitate it by *technology*. In light of Leonardo's later failure, the bird's violent action alludes first of all to an old topos, nature's *invidia* of human *ars*.[17]

*Fathers and sons*

"Tho' Earth and water in subjection laid, / O cruel Minos, thy dominion be, / We'll go thro' air; for sure the air is free",[18] says the mythical inventor of the airplane, the imprisoned Daedalus (Fig. 5). The myth interprets the air as an escape route and captivity as an incentive for technological innovation. A precursor of Leonardo, Daedalus imitates the birds on Crete and alters nature ("naturamque novat"). But his son Icarus becomes the first victim of Daedalus' emulation of nature: the father creates the technology that his son promptly uses as a means for disobedience. Icarus does not follow his progenitor, as he is ordered to do, but euphorically leaves the middle course and approaches the sun, until the wax of his wings begins to melt. The last word of the dying boy, a cry from the waves – "pater" – throws Daedalus into despair and makes him curse his technical skills ("devovitque suas artes").

The myth of Phaethon, son of the nymph Clymene, is comparable. Phaethon finds out that his father is none other than the sun god himself, Apollo, and visits him in his heavenly palace in India.[19] Apollo confirms Phaethon's discovery and hope. Yet the legitimized son, long neglected by his father, remains suspicious, and asks Apollo for an extreme sign

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17. Compare HORST BREDEKAMP, "Kulturtechniken zwischen Mutter und Stiefmutter Natur", in *Bild – Schrift – Zahl*, ed. IDEM and SYBILLE KRÄMER, Munich 2003, pp. 117–142. On the 'lamentation' of nature, see MECHTHILD MODERSOHN, *Natura als Göttin im Mittelalter: Ikonographische Studien zu Darstellungen der personifizierten Natur*, Berlin 1997, pp. 86–125. Leonardo's 'dream' episode allegorizes, in this perspective, Avicenna's famous "Sciant artifices" argument against alchemy (an argument explicitly accepted by Leonardo), with its solemn beginning: "Art is weaker than nature and does not overtake it, however it labors." See WILLIAM R. NEWMAN, *Promethean Ambitions: Alchemy and the Quest to Perfect Nature*, Chicago and London 2004, pp. 37, 120–127.

18. OVID, *Metamorphoses*, VIII.185–187; trans. JOSEPH ADDISON *et al.*, London 1717).

19. OVID, *Metamorphoses*, II.1–400.

of confidence: why should the son of the sun god not be allowed to drive the chariot of the sun? Apollo, moved by the sight of his son and presumably overwhelmed by a guilty conscience, has already given his oath to fulfill his son's every wish and is unable to change Phaethon's mind. Again, the flight begins euphorically, but destiny intervenes and Phaethon lacks both force and experience to keep the middle course. The chariot runs amok, and mother earth almost burns to ashes, but at this point Phaethon's grandfather Jupiter intervenes and sends salvific, deadly thunderbolts (Fig. 6). Again, a senior pilot and father desperately "hid his face, and pin'd for grief".[20]

The patterns of both Ovidian myths are strikingly similar: desire for freedom and the need to test paternal authority (in the case of Phaethon even legitimacy) provide the motives behind these journeys across the sky. Inebriated by great height, the youthful pilots ignore paternal admonitions, abandon the *juste milieu* (a difficult task even for their fathers), and crash to their deaths. Flying becomes a catastrophe *between fathers and sons*, a catastrophe echoed in the allusion to loneliness and lack of protection in the illegitimate Leonardo's fiction of a little boy left unattended under the Tuscan sky.[21]

Daedalus is an ambiguous figure who pays with his own blood for his most famous invention: in Dante's words, he is "quello / che, volando per l'aere, il figlio perse" ("he / Who, flying through the air, his son did lose").[22] Nevertheless, since the High Middle Ages, outstanding practitioners of the arts – the liberal and the mechanical – had been celebrated as 'Daedalian'.[23] On Andrea Pisano's mid-fourteenth-century reliefs on the Campanile in Florence, the bird-man Daedalus features prominently (Fig. 5), not only as an ancestor of technology but also as a concrete vision of future discoveries. The relief on the southern façade

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20. Ovid, *Metamorphoses*, II.329–330.

21. Leonardo owned a copy of the *Metamorphoses*; compare Madrid Codex, II, fols. 2v–3r. He quotes a passage from the book in a note as early as ca. 1480 (Codex Atlanticus, fol. 195r).

22. Dante Alighieri, *The Divine Comedy*, trans. Allen Mandelbaum, London 1995, Canto VIII, 125–126. See Stefano Prandi, "Il volo, il desiderio, la caduta. Icaro nella lirica italiana e francese del XVI secolo", *Italique*, VII, 2004, pp. 103–135.

23. Compare Albert Dietl, *Die Sprache der Signatur: Die mittelalterlichen Künstlerinschriften Italiens*, I, Berlin and Munich 2009, pp. 186–207.

continues the theme of the 'traditional' technologies of transport depicted on the eastern façade: the invention of the wheel (for *negotiatio*) on earth, and sail and oar (for *navigatio*) on water.[24]

Nevertheless, the fates of Icarus and Phaethon cast a problematic shadow over humanity's attempts at flight. In the Christian tradition, such attempts were considered something notoriously close to transgression, and to magic. Crowned with laurel, Simon Magus jumped from the Capitoline Hill into thin air, and, carried by demons, flew around until St. Peter ordered the demons to drop their pretentious cargo (Fig. 7).[25]

Fathers are concerned and gods disapprove when the sons of men want to fly. The privilege of the divine, the gaze from above, leads inevitably to human hubris. Petrarch is, therefore, aghast at the tremendous views from Mont Ventoux, and filled with regret. Only the hasty reading in St. Augustine's *Confessions* restores his peace of mind, redirecting his gaze from the height of mountains into the depths of his own soul.[26]

All the animals are satisfied with their conditions; only man has "wanted to go under water, to scratch everything inside the mountains, and struggled to move above the clouds".[27] Leon Battista Alberti's disturbing observation in his *Theogenius* leads us to our crucial question: why, for heaven's sake, did Leonardo want to fly at all? Alberti himself provides a clue to an answer. With his own emblem of a winged eye, he relates his self-image to flight in a very complex way. On his bronze medal of ca. 1432, we find this emblem prominently displayed in front of his throat, an unusual position that brings Leonardo's childhood memory back to mind (Fig. 8). On a drawing by Alberti and on another portrait medal,

24. Compare DOMENICO LAURENZA, "Gli studi leonardiani sul volo. Spunti per una riconsiderazione", in *"Tutte le opere non son per istancarmi". Raccolta di scritti per i settant'anni di Carlo Pedretti*, Rome 1998, pp. 189–202.

25. Acts 8:9–24.

26. Compare WOLFGANG RIEDEL, "Der Blick vom Mont Ventoux: Zur historischen Kontur der Landschaftsauffassung in Petrarcas Epistola familiaris IV, 1", in *Kulturwissenschaftliches Institut (Wissenschaftszentrum NRW), Jahrbuch*, 1996, pp. 77–108.

27. "volle sotto acqua, sotto terra, entro a' monti ogni cosa razzolare, e sforzossi andare di sopra e' nuvoli": LEON BATTISTA ALBERTI, *Opere volgari*, ed. CECIL GRAYSON, II, Bari 1966, p. 92.

executed by Matteo de' Pasti, the hieroglyphic *impresa* is completed by the motto "Quid tum?" – "What then?".[28]

## *The Festum Nivis*

So what did Leonardo intend to do with his flying machine? The traditional suspicion that human flight meant transgressing a border defined by God must have been 'in the air', as it were. Otherwise, Leonardo would not have reverted to the rare device of employing religious metaphors such as the rosary and the persona of Simon Magus in a technical context. It is not until the Turin Codex on the flight of birds that we get a hint that helps answer our question. Here, Leonardo recommends flying preferably above the clouds in order to avoid wet wings and turbulent thermals. More importantly, a greater height is useful for discovering more lands ("per iscoprire più paesi").[29] This is an important clue. With his flying machine Leonardo promises first of all – and this is not trivial – discoveries of the eye. Leonardo's promise can be compared to a passage for his planned book on painting: "What moves you, O man, to leave your dwellings in the city, your relatives and friends, and go to the countryside, on mountains and in valleys – what else than the natural beauty of the world which, if you consider it well, only the sense of sight enjoys?"[30]

Is the flying machine, therefore, simply a winged vehicle for the eye of its 'soul', the human pilot?[31] There are further hints as to its further purpose, and once again they can be found in the Turin Codex. Here, Leonardo foretells: "From the mountain that has the name of the big

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28. The most convincing interpretation of the emblem is by ULRICH PFISTERER ("'Soweit die Flügel meines Auges tragen': Leon Battista Albertis Imprese und Selbstbildnis", *Mitteilungen des Kunsthistorischen Institutes in Florenz*, XLII, 1998, pp. 205–251), who reads it in the context of Christian introspection, with direct references to Dante.

29. Turin Codex, fol. 6v.

30. LEONARDO DA VINCI, *Libro di pittura*, ed. CARLO PEDRETTI, Florence 1995, chapter 23.

31. Codex Atlanticus, fol. 434r; "Thus it could be said that the instrument made by man is lacking only the soul of the bird, which must be counterfeited with the soul of man" (trans. LAURENZA [as in n. 10], p. 86).

bird, the famous bird will begin his flight and fill the world with his splendor" (18v), and, probably immediately after, on the opposite inner cover page: "The great bird will begin his flight over the the back of the great swan [*cecero*], filling the universe with wonderment [*stupore*], filling all the scriptures with his fame, and *gloria eterna* to his native nest [*nido*]." Leonardo's poetic praise evokes the language of Christian hymns just as his childhood memory echoes solemn passages of Dante's voyage to heaven.[32] "Cecero" alludes to Monte Ceceri at Fiesole; it is there that Leonardo's glider would have begun its glorious flight over Florence, thereby realizing triumphantly the promise of the Daedalus relief on Giotto's Campanile.

But another passage in the same codex is even more revealing. Amid his observations on the flight of birds, Leonardo writes: "Summer snow will be carried to hot places; collected from high mountain peaks, it will be made to fall in summer spectacles in the piazzas."[33] The meaning of the passage seems to be quite evident, especially if we take into account that already in the prophecy of the "great swan" the level of allegorical encoding is indeed surprisingly low. Rather than being a riddle about the origin of urban fountain water in the snow on the peaks of mountains[34] (a problematic concept when confronted with Leonardo's thoughts about the hydrological cycle[35] and completely alien to the thematic coherence of the Turin Codex), Leonardo seems to refer again to none other than his "bird". Much more than a sublime vehicle for the winged eye, it

32. The angel accompanying Dante on Mount Purgatory has open wings "che parean di cigno" (*Purgatorio*, XIX.46). On this passage and the particular importance of *Purgatorio*, IX, see MAX MARMOR, "'...par che sia il mio destino...': The Prophetic Dream in Leonardo and Dante", *Raccolta Vinciana*, XXXI, 2005, pp. 145–180. VECCE (as in n. 6) emphasized the presence of the zodiacal sign of Scorpio in *Purgatorio*, XIX.5–6, the "freddo animale / che con la coda percuote la gente".

33. "porterassi neve / dj state ne lochi / chaldj tolta dallal / te cime de monti / essi lasciera ca / dere nelle feste / delle piaze nel / tenpo della state": Turin Codex, fol. 13r. For an alternative translation, see CARLO PEDRETTI, *The Literary Works of Leonardo da Vinci...: Commentary*, I, Oxford 1977, p. 400.

34. See note 34 and also LUIGI FIRPO, "Il codice vinciano della Biblioteca Reale di Torino", in *Leonardo da Vinci. Il codice sul volo degli uccelli*, Turin 1991, p. xxx.

35. See FRANK FEHRENBACH, *Licht und Wasser: Zur Dynamik naturphilosophischer Leitbilder im Werk Leonardo da Vincis*, Tübingen 1997, pp. 215–229.

promises to function here as a precious means of transporting relief from summer heat, as a machine for festivities, offering unprecedented joy in the unbearable heat of summer. In the years around and after 1508–10, "amusement, fantasy, and theatrics" appear to play a major role in Leonardo's considerations of flight.[36] In 1590, Giovan Paolo Lomazzo included Leonardo's studies of the flight of birds in the context of his automata and theater devices.[37] In this perspective, then, the flying machine provides further proof of the fundamental role of public joy and entertainment as a motor of early modern technology.[38]

Summer snow in the city: as in the case of his childhood memory and the prophecy of his "great swan", Leonardo's "travail de condensation" (Daniel Arasse) is remarkable, and again, the transformation of a Christian paradigm becomes evident. According to legend, during the pontificate of Liberius (352–366), it snowed in the middle of summer in Rome; more specifically, on the Esquiline Hill, the Mons Superagio.[39] The pope and a patrician, John, envisioned it simultaneously in their dreams and rushed to the site where the miracle, caused by the Virgin Mary, had happened. The significance of the meteorological phenomenon immediately became clear; on the area covered by snow, a church should be erected and dedicated to the Virgin, the future basilica of Santa Maria Maggiore. John and his wife died childless, bequeathing their wealth after the miracle to the construction of the church. Only in the thirteenth century would the Church, at the instigation of the Franciscans, declare the fifth of August a 'snow holiday', or *Festum Nivis*, which had, of course, its epicenter in Rome. Filippo Rusuti's façade mosaics for Santa Maria Maggiore were

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36. Laurenza (as in n. 10), p. 117, with reference to Codex Atlanticus, 166r, 629bv; Royal Library, Windsor, 12724r, 12506.

37. Giovan Paolo Lomazzo, *Idea del tempio della pittura* (1590), Bologna 1785, p. 37: "insegnò il modo di far volar gli uccelli, andar i leoni per forza di ruote, e fabbricare animali mostruosi".

38. Paula Findlen, "'Quanto scherzevole la natura'. La scienza che gioca dal Rinascimento all'Illuminismo", *Intersezioni. Rivista di Storia delle Idee*, III, 1990, pp. 413–436; Horst Bredekamp, *The Lure of Antiquity and the Cult of the Machine*, Princeton 1995, esp. pp. 69–80.

39. Henk W. van Os, "Schnee in Siena", *Nederlands Kunsthistorisch Jaarboek*, XIX, 1968, pp. 1–50. See also Machtelt Israëls, *Sassetta's Madonna della Neve: An Image of Patronage*, Leiden 2003, esp. pp. 97–104.

the first detailed portrayals of the miraculous event (ca. 1300; Fig. 9), but the first monumental representation of the refreshing miracle in central Italy and outside of Rome is in the chapter hall of San Francesco in Pistoia, close to where Leonardo spent his childhood years. The fresco, now much damaged, was probably painted by Antonio Vite, toward the end of the fourteenth century (Fig. 10).[40]

One of Leonardo's earliest and most famous drawings, a pen-and-ink landscape in the Uffizi (Fig. 11), is dated "on the day of our Lady of the Snow, on 5 August 1473" ("dì di santa Maria della neve / addì 5 dagghossto 1473"). According to Romano Nanni's detailed observations, Leonardo executed a synthetic view of the Montalbano area close to Pistoia, with the castle of Montevettolini on our left and the marsh of Fucecchio further down in the valley.[41] Framed by a wooded hill with a cascade on the right-hand side and the castle on the left, the beholder's gaze floats into the depth of space, crosses the plain with its 'perspectival' grid of irrigation channels, and continues its imaginary flight over the hazy peaks of Montecarlo in the west. Was this the spot, in close proximity to his birthplace, to an early oratory of the Madonna della Neve (at Montevettolini), and to Pistoia with its spectacular depiction of snowfall

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40. ENRICA NERI LUSANNA, "La pittura in San Francesco dalle origini al Quattrocento", in *San Francesco. La chiesa e il convento in Pistoia*, ed. LUCIA GAI, Ospedaletto 1993, pp. 110–160.

41. ROMANO NANNI interprets the Uffizi drawing in relationship to the *Festum Nivis* without reference to the flying machine: "'Porterassi neve di state ne' lochi caldi…'. Leonardo, Vinci e il Montalbano", in *Vinci di Leonardo. Storie e memorie*, ed. IDEM and ELENA TESTAFERRATA, Ospedaletto 2004, pp. 13–112. For both aspects, see my sketch of this article: "Hier stehe ich, aber mein Auge durcheilt die Räume: Die Vogelstudien und Flugversuche von Leonardo da Vinci", *Frankfurter Allgemeine Zeitung*, 27 April 2002, p. 47. For the oratory of the Madonna della Neve at Montevettolini, see ANNA BENVENUTI and ISABELLA GAGLIARDI, "Santuari in Toscana. Primo bilancio di una ricerca in corso", in *Per una storia dei santuari cristiani in Italia. Approcci regionali*, ed. GIORGIO CRACCO, Bologna 2002, pp. 274–278, 308. GIULIO CARLO ARGAN reads the inscription of Leonardo's landscape drawing as a reference to the hydrologic cycle ("5 Daghossto 1473", in MICHAIL ALPATOV *et al.*, *Leonardo. La Pittura*, 2nd edition, Florence 1985, pp. 9–13). The most detailed discussion of the drawing is in GEOFF LEHMAN, *Measure and the Unmeasurable: Perspective and the Renaissance Landscape*, Ph.D. diss., Columbia University 2010, chapter 1 (with extensive bibliography).

in summer, where young Leonardo desired to fly for the first time?[42] Do the drawing and its inscription hint at a second childhood memory, never explicitly formulated but echoed in the pages of the Turin Codex? Like the Mother of God, Leonardo's flying machine would bring summer snow to the city. But Leonardo's 'fate' would be working against this dream: the big bird, scornfully moving his tail, a technically impossible part of Leonardo's various projects.

On Mino da Fiesole's representation of the snow miracle for the ciborium (1463) of Santa Maria Maggiore in Rome, host-like snowflakes, layered like the feathers of a wing, form a triangle and pour down from the mouth of another baby, a chubby-faced seraph (Fig. 12). Henk van Os has illuminated the liturgical background of the *Festum Nivis* and shown that snow as an attribute of Mary's purity was often interpreted in the light of the prayer for purification in Psalm 51:7: "Thou shalt sprinkle me with hyssop, and I shall be cleansed: thou shalt wash me, and I shall be made whiter than snow."[43] But the psalm offers also significant parallels to Leonardo's childhood memory. It contains an evocation of the Holy Spirit (11) – iconographically not a kite but a white dove – and asks for the opening of the lips so that tongue and mouth will be liberated to sing the praise of God: "O Lord, thou wilt open my lips: and my mouth shall declare thy praise" (15).

As Leonardo's desire to fly seems to be anticipated in his *earliest* surviving landscape drawing, so we find an echo of the failure of this most ambitious technological project in his *last* panoramic landscapes, at a time when Leonardo was still interested in the flight of birds, but no longer – with rare exceptions – in the flying machine. The drawings of his so-called Deluge series (ca. 1515) exemplify above all an urgent order: this is an absolute no-fly zone![44] In the turmoil of the elements on the largest of these sheets (Fig. 13), only angels are able to escape harm. Quite significantly, Leonardo represents them as small, classicizing putti,

42. According to GIORGIO CASTELFRANCO, the drawing of 1473 reflects the young Leonardo's desire to fly: "Il paesaggio di Leonardo" [1956], in IDEM, *Studi Vinciani*, Rome 1966, pp. 140–142.

43. VAN OS (as in n. 41), p. 27 note 40.

44. FEHRENBACH (as in n. 37), pp. 291–331.

although the model for their attitude (the classical 'trumpeter's attitude' with one arm touching the back of the head), in Giotto's *Navicella* mosaic in Saint Peter, represents menacing adult wind gods.[45] Leonardo's babies, virtuosi of flight, dominate the hurricanes. No bird's tail fumbles at their lips, and no snow escapes their mouths. Instead, with these lips they play long trumpets that cause devastating whirlwinds. And, in a contemporary apocalyptic drawing (Fig. 14), it is not snow that falls down on partygoers, but a rain of flames that tortures the damned.

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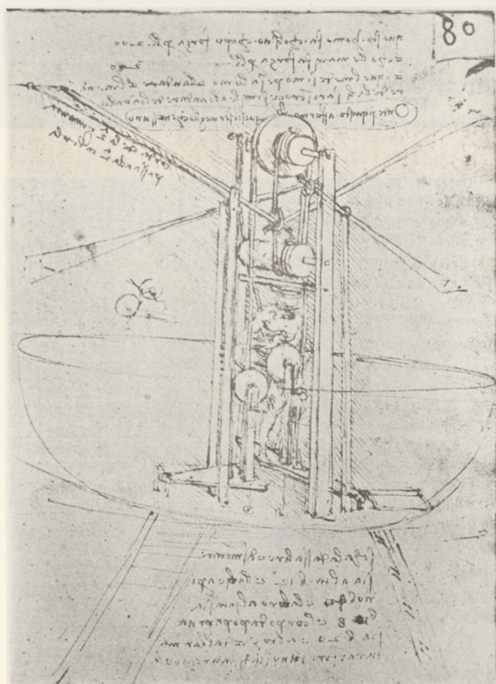
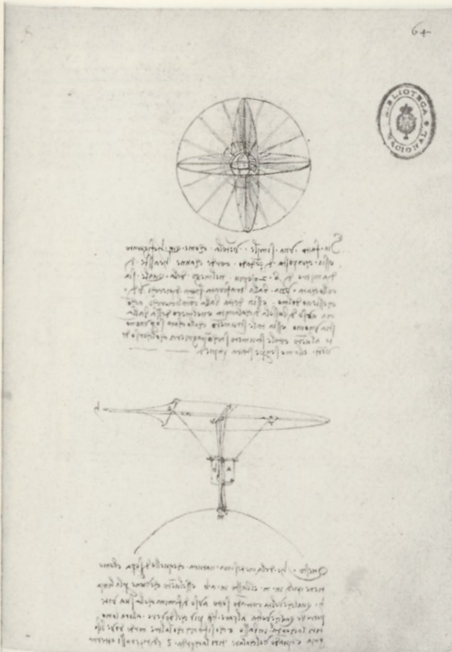
45. For the attitude, see THOMAS RAFF, "Die Ikonologie der mittelalterlichen Windpersonifikationen", *Aachener Kunstblätter*, XLVIII, 1978–79, pp. 160, 165–167.

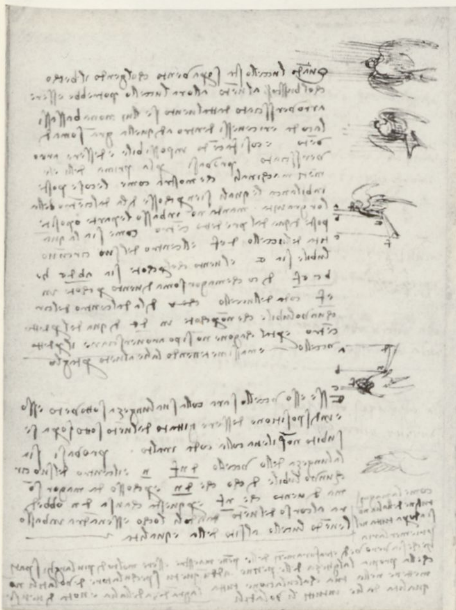



1. WALTON FORD, *Ricordazione*, 2005, watercolor, gouache, pencil, and ink on paper, 108.9 × 158.8 cm.

2. LEONARDO DA VINCI, *Study of a Flying Machine with Operator in Lower Parts (ornithopter)*, MS B, fol. 80r, ca. 1490. Bibliothèque de l'Institut de France, Paris.



3. LEONARDO DA VINCI, *Study of a Hang-glider*, Madrid Codex 1, 64r, ca. 1495, pen and ink. Biblioteca Nacional, Madrid.



4. LEONARDO DA VINCI, *Study of the Flight of Birds*, Turin Codex, fol. 8v, ca. 1505, pen and ink. Biblioteca Reale di Torino, Turin.

5. ANDREA PISANO, *Daedalus*, ca. 1434–43, marble, 83 × 69 cm. Relief from the campanile of the cathedral, Florence. Museo dell'Opera del Duomo, Florence.

6. Phaethon sarcophagus, second century AD, marble. Galleria degli Uffizi, Florence, no. 1914/181.

7. Cimabue, *The Fall of Simon Magus*, ca. 1280, fresco. Upper Church of the basilica of San Francesco, Assisi.

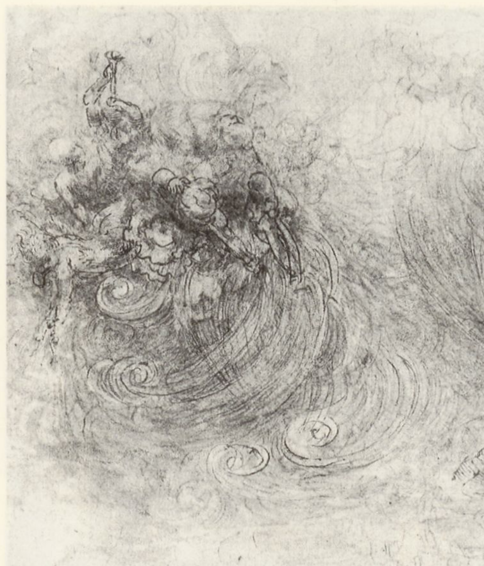
8. Leon Battista Alberti, *Self-portrait*, 1435, bronze, 20.1 × 13.6 cm. Samuel H. Kress Collection, National Gallery of Art, Washington, D.C.

9. Filippo Rusuti,
*The Miraculous Snowfall*,
ca. 1300, mosaic. Santa Maria
Maggiore, Rome.

10. Antonio Vite,
*The Miraculous Snowfall* (right),
end of the fourteenth century,
fresco. Chapterhouse
of San Francesco, Pistoia.

11. LEONARDO DA VINCI, *Landscape*, 1473, pen and ink, 19.5 × 28.6 cm. Gabinetto Disegni e Stampe degli Uffizi, Florence, no. 8 P.

12. MINO DA FIESOLE, *The Miraculous Snowfall*, 1473, marble, from the ciborium of Cardinal Guillaume d'Estouteville, Santa Maria Maggiore, Rome.



13. Leonardo da Vinci, *Hurricane* (detail), ca. 1515, pen and ink over black chalk with touches of wash and white heightening, 27.0 × 41.0 cm. Royal Library, Windsor, no. 12376.

14. Leonardo da Vinci, *Scenes from the Apocalypse*, ca. 1515, pen and ink over traces of black chalk, 30.0 × 20.3 cm. Royal Library, Windsor, no. 12388.