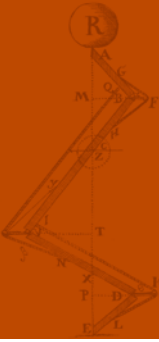


# Leonardo's Knight

Tell me if ever, tell me if ever anything was built in Rome ...

Leonardo da Vinci, CA, f. 216 v-b [579 r] c. 1495



Carlo Pedretti was the first to discover the tell-tale fragments of Leonardo's Robot Knight in the Codex Atlanticus.<sup>1</sup> My effort to interpret and reconstruct Leonardo's Knight began with my book *Robot Evolution* and would lead me on an odyssey around the world. It would take me three generations to get it right, finally coming to me in, of all places, my local gym. The armored Robot Knight sat up; opened its arms and closed them, perhaps in a grabbing motion; moved its head via a flexible neck; and opened its visor, perhaps to reveal a frightening physiognomy. Fabricated of wood, brass or bronze and leather, it was cable operated and may have been built for a grotto similar to those built by Salomon de Caus (1576–1626)<sup>2</sup> perhaps with the accompaniment of automated musical instruments.<sup>3</sup>

What was the occasion for Leonardo's original Robot Knight? What patron required such a splendid demonstration of his wealth and power? Leonardo's project for the Robot Knight may have dated to the time of his work on the Last Supper and the decoration of the Sala delle Asse at the Sforza Castle, a period of some five years (1494 to 1498).

<sup>1</sup> Leonardo da Vinci, *Fragments at Windsor Castle from the Codex Atlanticus*, Carlo Pedretti (ed.), London, Phaidon, 1957, pp. 39–40, no. 12705. See also his later *Leonardo Architetto*, Milan, 1978 (English edition, London, 1986, and New York, 1991), pp. 319–323. In his edition of the Madrid manuscripts (New York, 1974), vol. III, Commentary, p. 76 note 13, Ladislao Reti mentions the robot sheets in the Codex Atlanticus as follows: "On fols. 366 r-b [1021 r] and 216 v-b [579 r] of the Codex Atlanticus, different armor parts are sketched. They do not belong to an actual suit of armor. The articulations are clearly shown, indicating that the project was for an automaton in the form of an armored warrior. Perhaps the armor parts shown belong to the same project." A reproduction of the central part of f. 366 (recto and verso) with the Windsor fragment RL 12705 in place, is given in the exhibition catalogue *Leonardo da Vinci, Studies for a Nativity* and the "Mona Lisa Cartoon," edited by Carlo Pedretti, Los Angeles, University of California, 1973, pp. 27–28, figs. 5 and 6. See also Pedretti's chapter on 'Anathomia Artificialis' cit. in Chapter I, note 25 above, vol. II, pp. 868–871. I do not know of any other reference to Leonardo's robot studies. See, however, my own *Robot Evolution: The Development of Anthropotics*, New York, Wiley, 1994, pp. 12–20.

<sup>2</sup> Salomon de Caus, *Les raisons des forces mouvantes avec diverses machines tant que plaisantes*, Frankfurt a. M., 1615. Cf. Bertand Gille, *Engineers of the Renaissance*, Cambridge, Massachusetts, MIT Press, 1964 (original edition in French, Paris, 1966), p. 236. See also the paper by Luigi Zangheri cited in note 17 below. Concordance as given by Ladislao Reti in his edition of the manuscript (as in note 1 above), p. 76 (CA, f. 36 r-a, b [100 r, 101 r] and v-a, b [102 r, 103i r]).

<sup>3</sup> See Leonardo's description of the garden planned for the suburban villa of Charles d'Amboise in Milan, CA, f. 271 v-a [732iii v], c. 1508: "With the help of the mill I will make unending sounds from all sort of instruments, which will sound for so long as the mill shall continue to move." Cf. Carlo Pedretti, *A Chronology of Leonardo da Vinci's Architectural Studies after 1500*, Geneva, Droz, 1962, p. 38. See also, by the same author, *Leonardo da Vinci. The Royal Palace of Romarantin*, Cambridge, Massachusetts, Harvard University Press, 1972, pp. 52 and 98, as well as the Richter *Commentary*, vol. II, pp. 29–31. Leonardo was certainly acquainted with late fifteenth-century examples of garden design, including those of Poggio Reale at Naples and the Rucellai at Quaracchi near Florence. It was for Bernardo Rucellai that he planned an ingenious water-meter for irrigation, as shown by a document that Pedretti discovered in Venice in 1951, namely the Golpaja Codex, that mentions a robot (a wooden man).

**Fig. 3.1.**

A map of medieval Milan the Sforza Castle, to the north east the park

In Leonardo's time, important political events called for impressive displays of pageantry. The years 1493 and 1494 were of special significance to the shrewd politics of Ludovico Sforza. The wedding of his niece, Bianca Maria, to Emperor Maximilian I forged closer ties between Sforza and the emperor, thereby ensuring a speedy recognition of Ludovico's title as Duke of Milan following the death of the young duke Galeazzo Maria Sforza at Pavia in 1494. In the same year, Ludovico instigated the French king, Charles VIII, to move down to Italy against the king of Naples. Any of these events and their associated celebrations could have provided an occasion for the appearance of Leonardo's technological wonder. As Carlo Pedretti has suggested to me, a suitable setting for the robot's first appearance could have been the park of the Sforza Castle. Embellished by Galeazzo Sforza, it was later abandoned and almost torn down before being restored by Luca Beltrami at the turn of the last century. The castle was constructed by Francesco Sforza as his residence and fortress, complete with moat, in 1450 (Fig. 3.1).

Access to the park from the ducal apartments was through Bramante's bridge, the ponticella, over the moat by the northeast tower of the Castle, where the Sala delle Asse is located. The park is best known for an elaborate pavilion at the center of a living labyrinth—a setting recorded by Leonardo himself, and was a place selected by him as a sort of testing ground for his inventions and experiments.<sup>4</sup>

The Sala delle Asse, a variation on the theme of the Renaissance grotto, is composed of a painted forest canopy on the ceiling and images of tree trunks lining the walls. The purpose of the room other than as an extension of the park, perhaps as a renaissance Tower of the Winds (see "Bell Ringer", below) providing both education and entertainment,<sup>5</sup> is long lost. It may have been intended as a man-made microcosm in which to display automata such as the Knight.

<sup>4</sup> It would be enough to mention the closing paragraph in the famous letter of Ludovico Sforza (CA, f. 391 r-a [1082r], c. 1482, Richter, §1340): "And if any of the above-named things seem to any one to be impossible or not feasible, I am most ready to make the experiment in your park ...". See, however, for other pertinent reference to the park of the Sforza Castle, Richter *Commentary*, vol. II, pp. 31–32 and 186.

<sup>5</sup> Volker Hoffmann, "Leonardos Ausmalung der Sala delle Asse im Castello Sforzesco", in *Mitteilungen des Kunsthistorischen Institutes in Florenz*, XVI, 1972, pp. 51–62, for recent interpretations of the symbolism of the Sala delle Asse; John F. Moffitt, Leonardo's «Sala delle Asse» and the Primordial Origin of Architecture", in *Arte Lombarda*, N.S., nos. 92–93, 1990, 1–2, pp. 76–90; Dawson Kiang, "Gasparo Visconti's Pasitea and the Sala delle Asse", *ALV Journal*, II, 1989, pp. 101–109. See also Carlo Pedretti, *Leonardo. A Study in Chronology and Style*. Berkeley and Los Angeles, University of California Press, 1973 (2<sup>nd</sup> Ed., New York, Johnson Reprint Corporation. Harcourt Brace Jovanovich Publishers, 1982), pp. 76–77.