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Of Engineers and Dragons
The JIHI Logo

by
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We inaugurate here a series of unpretentious short notes devoted to episodes in the history of ideas that in one or the other way display our concept of its interdisciplinarity. The first one is about the Journal's logo.

<div align="right">

Serpens ni edat serpentem, draco non fiet
(Erasmus, *Adag.* 2261)

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O WHETHER it succeeds or not, the logo of the JIHI has been chosen to embody the character of the project. It consists, in fact, of a graphic elaboration based on an early modern iconographic source that delightfully reflects the features of what we are seeking when we do interdisciplinary history of ideas. It is a dragon, a fabulous beast, drawn by a 15th century engineer, Mariano Taccola (1382-1453), to mark the title page of a manuscript that was the second part of a portfolio, if we may call it so, displaying his skills to a king he hoped would employ him.
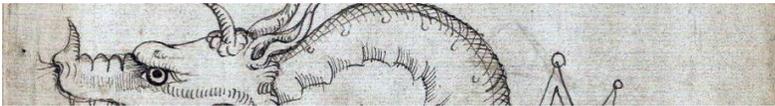
1 MARIANO di Iacopo, named Taccola ('jackdaw'), came from Siena, where he also spent most of his life. He was one of those Sienese engineers who paved the way for the new intellectual artist-engineers,

whose best known personification is Leonardo da Vinci (Galluzzi 1991; Long 1997). He was a friend of Leon Battista Alberti and Toscanelli Dal Pozzo, and even got to know Brunelleschi at some point. Like Francesco di Giorgio Martini, who owned part of his writings and whose work is clearly influenced thereby (Degenhart and Schmitt 1982), his own work is descended from that of Vitruvius and Philo of Byzantium. But he was also quite inventive and his manuscripts, as it happens, were influential copybooks for other engineers throughout the fifteenth century.

Self-described as 'the Archimedes of Siena', Taccola was as much an engineer as an artist and the principal book that has been written on him (Prager and Scaglia 1972) required, as had been the case for their book on Brunelleschi as well, the cooperation of a historian of technology and a historian of art. He was a painter, sculptor and woodcarver: from 1408 to 1442 he carved more than thirty gargoyles ("ghorgolle cioè animaluzzi di legname") and scores of wooden heads for the choir of the main altar in the Duomo of Siena (Milanesi 1854, 286; Beck 1968, 319).

Taccola's best known work is a *De machinis* that he completed in 1449; he is also remembered for his early *capitula* (short texts) on hydraulics, composed between 1419 and 1425, and for the work we shall be dealing with: his *De ingeneis*, 'On Engines', dated 1433. It is a four-part[1] pictorial treatise on engineering, which Taccola prepared for Sigismund, king of Hungary and, since 1431, king of Italy, when he stopped off in Siena while traveling to Rome, where he would be crowned emperor. The treatise is nicely illustrated and it is not only machines that are depicted. The second part is opened by our dragon (f. 76r); a similar dragon fights, as usual, against St. George (III, f. 48r); real and fantastic animals[2] embellish the pages; there is a full-person portrait of king Sigismund himself, who treads on the tail of the Florentine lion, and an elegant and dignified Saint Dorothy, bringing the child Jesus by the hand, makes an unexpected appearance (III, f. 69r) to recommend the author to his royal—and soon imperial—dedicatee. One cannot forget to mention the incredible depic-

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[1] The first and second parts are reproduced in Taccola 1984, vol. 2; the third is reproduced in Taccola 1969.
[2] Concerning these, "Taccola works with facts and fantasy" (Prager and Scaglia 1972, 186).

tion, at f. 31r of the first part, of a man in armour riding a giant fish, in the mouth of which he is pouring oil with the help of a sponge: Taccola adds to it a promotional note of a suitably mysterious tone[1].

2 Our dragon is a big (full-page, like King Sigismund's portrait), imposing, two-legged dragon with wings and a barbed tail. In heraldic terms, it would be called a wyvern. Such dragons are an ancient symbol of power. It was well known to military engineers like Taccola that the roman cohorts raised dragons ("dracones et signa constituunt"[2]). And an order of the Dragon had been erected in 1408 by the same Sigismund to whom Taccola addressed his pleas[3].

The dragon is intrinsically polysemic, and an emblem of the permeability between zoology and the symbology of power: a permeability which is comprehensibly higher with fantastic animals, that, as such, inherently bear the marks of symbolization and are easily endowed with the traits of ominous puissance.

Were there, from the point of view of late mediaeval or early modern engineers, other and more specific reasons for interest in dragons? On f. 126r of Taccola's second part, near the depiction of a war machine with a movable projecting beam (a sort of ram) in the form of a unicorn,

[1] The purpose and functioning of this device is a secret of his that, as might be expected, has remained unexposed. On Taccola and the practices of secret by 15th century engineers see Long 2001, 115-18; in Prager 1968 the first detailed analysis of the passages where Taccola reproduces a conversation on such matters with 'Pippo Brunelleschi'.

[2] Vegetius, *De re mil.* I 23, see also II 7 and 13.

[3] See Du Cange, *Gloss.*, s.v. Draco; Wojatsek 1972, 112; although Giustiniani 1692, II, 718-19 brings documents in favor of the pre-existence of the order, or of an order with the same name. Its emblem, though, seems to have been an overthrown dragon (Ashmole 1715, 65), the pliable symbol of heresy, pagan foes, sin and temptation.

there is a smaller drawing of a chariot in form of a dragon, near other chariots with seemingly incendiary devices. Indeed the connection between fire-arms and dragons is easy, tempting and historically returning. The term 'dragon' will be used after another century or so to describe a sort of handgun or blunderbuss, early versions of which might have been decorated with a dragonhead carved around the muzzle, so that the blast would seemingly come out of the mouth of a dragon (for centuries, to be sure, musket side plates will be designed to look like a dragon).

A fearsome-looking contrivance (a so-called *machina Arabica*), in the shape of a great dragon, with between its teeth a cannon throwing an arrow, is depicted by Roberto Valturio in his *De re militari*. It has a look-out perched, not, as its remote descendant Puff, on its 'gigantic tail', but on its head. It is a mobile fortress equipped with mounted guns, with a movable ladder on the front, to be used in siege warfare[1]. In the *Codex Atlanticus*, c. 149r, we find the famous *Giant Crossbow*, whose arc calls to mind a dragon's wings. It is in turn reminiscent, likely, of Valturio's dragon war machine (Landrus 2010, 68-72).

On the one hand, a dragon stands for any powerful and invincible fire-spouting device. On the other hand, both in narratives and in iconography, a dragon is the symbol of sheer power. Even the vanquished dragon is a symbol of power, although it is the overturned power of a former fiend.

Both in the ancient and in the Christian tradition there is an overlapping of snake and dragon. The major snake-slayers—Cadmus and Jason, St. Michael and St. George—fight against 'dragons'. But the dragon, as it is a purer symbol of power, is a kind of Über-snake. This conspicuity is most effectively expressed in Erasmus' *Adages* by the saying: *Serpens ni edat serpentem, draco non fiet*. It is for Erasmus a less vulgar version of the common saying according to which 'big fish eat small fish'[2], that "A ser-

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[1] Valturio 1472, 2006; the Library of Congress provides a digital reproduction from Bruno 1995 (http://www.loc.gov/pictures/item/2006680134/ consulted on Jan. 12, 2012).

[2] And thus we may have come full circle, since on f. 28v of the III part of Taccola's *De ingeneis* there is represented a large fish swallowing a smaller one, with the inscription *Minor piscis semper a maiore sorbetur* ('the smaller fish is always devoured by a bigger one'; Taccola 1969, 148).

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pent, unless it devours a serpent, will not become a dragon". Its meaning is strictly political: that "the powerful grow at the expense of others"[1].

3 Engineers and dragons together: that's a nice piece of interdisciplinarity in intellectual history. But in such matters there's always more. At the time of our engineers, the best-known version of the slaying of Ares' dragon by Cadmus is that of Ovid's *Metamorphoses* (III 27 ff.), due to the dragon's teeth turned into armed men. Here the dragon is a "Martius anguis" of caeruleus color[2],

> Martius anguis erat, cristis praesignis et auro;
> igne micant oculi, corpus tumet omne veneno;
> tresque vibrant linguae, triplici stant ordine dentes.

> There dwelt a snake, a snake of Mars. Its crest
> Shone gleaming gold; its eyes flashed fire; its whole
> Body was big with venom, and between
> Its triple rows of teeth its three-forked tongue
> Flickered.[3]

At that time, there also existed an Italian prose version of the *Metamorphoses*, composed in the 1370s by a Giovanni Bonsignori from Città di Castello[4], with ample commentaries that reproduced the allegoric intepretations devised by Giovanni del Virgilio. Here we find another and somewhat divergent way of looking at dragons.

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[1] *Adag.* 2261; CW 34, 302-03.
[2] Often interpreted as a color so dark as the sky at night: "Caeruleus serpens. Niger et propter hoc horrendus", as we can read in the commentary added to the first print edition by the Venetian humanist Raphael Regius (Regio 1493, c. d [v] verso).
[3] Ovid, *Met.*, III, 32-34; 1986, 53.
[4] In the *editio princeps* (Bonsignori 1497) the proemium is dated 1370; the DBI (XII, s.v. Bonsignori) prefers the datation 1375-77 provided by a Magliabechian ms.

Bonsignori, in his commentary, first narrates the history of Cadmus' foundation of the city of Thebes as a true and mundane tale of kings, treasures, cities, and peoples. But after that he explains the *Allegory of Cadmus* and of the "fabulous history" of his battle with the dragon: the truth is, he tells the readers, that Cadmus was a "preeminent philosopher" (*vero è che Cadmo fu summo philosopho*) and the dragon a competitor in the trade. This quite surprising idea comes directly, as already mentioned, from Giovanni del Virgilio[1]. But the latter's Latin commentary remained nearly entirely ignored, while Bonsignori's Italian version was a massive success.

Cadmus the philosopher, after the foundation of his own city of Thebes, heard tell that in Athens another philosopher was spreading false opinions (*con falsa opinione*) that brought about many errors in the world. He sent his disciples against him, but they were all won over in dispute by the enemy, who was able to confound them (*li confuse e vinse*): in the allegory they were killed by the dragon-snake, whose venom is a simile for the philosopher's fallacious doctrines. Cadmus himself did battle with him then, and first posed him easy questions that the other answered without much bothering (corresponding to the stone that Cadmus threw against the dragon, with no result, in Ovid's narration), then pressed him with other and more difficult questions (*con forte questione*—corresponding to the first wound). Finally, since the dragon was still battling, Cadmus killed

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[1] "Prima transmutatio tercii libri est de Cadmo. Nam Cadmus fuit quidam maximus philosophus in Thebis, qui suos discipulos misit Athenas ut disputarent cum quodam alio doctore sapientissimo quem intelligo per serpentem" (in Ghisalberti 1933, 51). The following verses by John of Garlandia might have inspired, or rather confounded, his interpretive genius: "Est serpens sapiens quem Cadmus vincit et illi | Machina plena viris bellica fundit eos. | Ut serpens serpit pauper sed pectore prudens | Invenit hic tandem gramata greca prius" (Johannes de Garlandia 1933, vv. 153-156).

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him with his steeled-tip spear: that is, he attacked him not with ordinary questions, but with "profound doubts" and thereby defeated him (*Cioe vol dire che vene con profundi dubii: per li quali quel philosopho fu vinto*)[1].

Belligerent ideology of evil power defeated by *doubt*: they be dragons or philosophers, that would have pleased Erasmus immensely.

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[1] The text of the *princeps* from which we are quoting (Bonsignori 1497, c. XXr) is only slightly different from that of Ardissino's critical edition (Bonsignori 2001, 187-88). In the following, the reader learns that Pallas Athena's intervention and the battle between the armed men born from the dragon's teeth allude to Cadmus' wisdom and lore, that destroy the errors the enemy has spread. That only five of them survived is in turn an allegory for the vowels *a e i o u*, by the use of which Cadmus lay the foundation of all sciences. This is all a bit professorial.

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The ms. is reproduced in vol. 2, that can be viewed and downloaded at `http://ebooks.library.cornell.edu/k/kmoddl/browse.html`. The dragon can be reached directly at `http://tinyurl.com/dragon-for-jihi`.

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