



# FREDERICK II

THE INTEREST OF THE COURT IN CULTURE AND EDUCATION

ASTROLOGY

the work of Micheal Scot

MATHEMATICS

the relationship with Fibonacci

MEDICINE

the regulations of the *Constitutiones Melphitanae*

PHILOSOPHY

the cultivation of philosophy

ORNITHOLOGY

the treaty about falconry

# ASTROLOGY

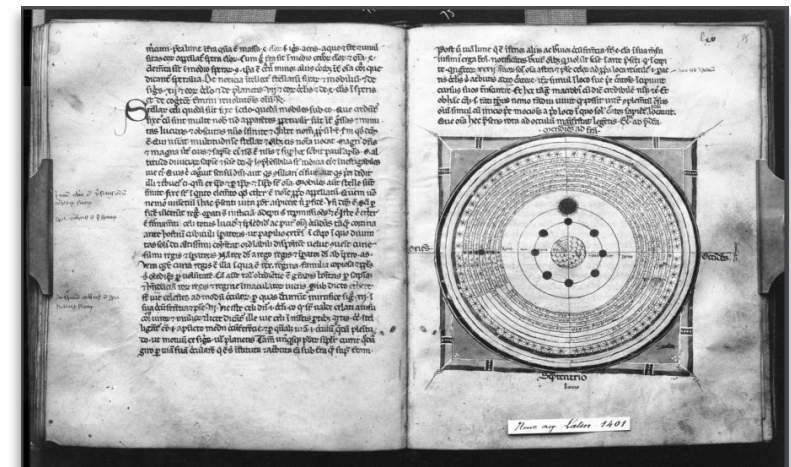
- Particularly thanks to the work of **Micheal Scot** (a Scottish philosopher and alchemist), the complex scientific activity of the court of Frederick II could finally be developed. When he met the emperor around 1227, he had already operated in Toledo translating different works, such as:
  - *De motibus caelorum* («The Motion of Stars») by al-Biṭrūḡī (an Arab astronomer and philosopher);
  - *Historia animalium* («History of Animals») by Aristotle;
  - the *Long Commentaries* about Aristotle's *De coelo* («The Sky») by Averroè.

His work of scientist, researcher and translator of Aristotle, Avicenna and Averroè could be reconciled with his job of **astrologer**. In fact, he wrote the *Liber quattuor distinctionum* («The Book of the Four Distinctions») the *Liber particularis* («The Particular Book») and the *Liber physiognomiae* («The Book of Physiognomy»), composing together the *Liber introductorius* or a complete introduction to astrology. The essay, crucial text of the astrological doctrine at Frederick II's time, tries to adapt the Arab-Latin translations of the astrological texts to the Christian and imperial society, and also conceives that astrology can only be considered second to theology.

# ASTROLOGY

- In the *Liber introductorius*, the theoretic notions of astronomy and the mathematical instrumentations are reduced to a minimum. The text obeys to a **descriptive, didascalical intent** primarily addressing it to a target of interested people, although they lack of any scientific knowledge. Coherently, even if the *Liber* contains a deep, true interest for the study of eclipses and the dependance of the sublunar world on the movement of the stars, it is the application level – linked to the questions of the everyday life – to prevail. Indeed, a whole large section of the book is all dedicated to an utterly detailed illustration of astrological issues, which should have served almost as a handbook for the astrologists by profession.

Therefore, since the first pages of the essay, Micheal Scot recognizes the existence of a bond between the sublunar world and the celestial bodies, considering the configuration of the stars as an effect of the **divine will**.

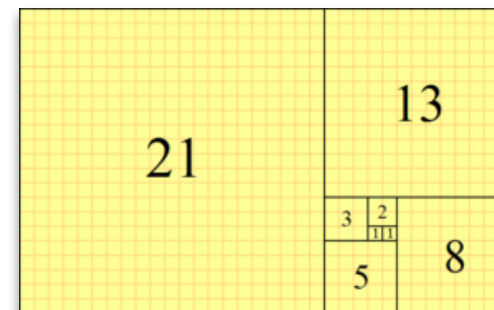


Pages 64-65 of the most ancient manuscript of the *Liber introductorius* (nouv. acq. lat. 1401).

# MATHEMATICS

- Mathematics is a non-secondary component of the Frederician culture, due to the epistolary relationship that the sovereign and some of his court's characters maintained with **Leonardo Fibonacci**. An important moment was the personal meeting between the mathematician and the emperor, which took place in Pisa probably in 1226. In his way to Sicily, the court stopped in Pisa, where Frederick did not miss the opportunity to meet the now famous mathematician (who had already published his major work *Liber abaci*, «The Book of Abacus», in 1202).

Fibonacci himself, in his work entitled *Flos super solutionibus quarundam questionum ad numerum et ad geometriam vel ad utrumque pertinentium* («Flower of solutions to some problems involving numbers and geometry»), recalls a lively conversation with Frederick, when Johannes, one of the *magistri* of the court, proposed three questions to be solved with **algebraic calculations**.



A squared representation of the famous Fibonacci sequence, described in the *Liber abaci* and appearing in different biological settings.

# MATHEMATICS

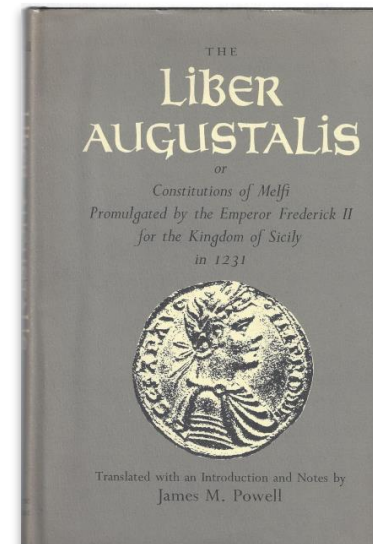
- It seems that also the genesis of another work by Fibonacci, the *Liber quadratorum* («The Book of Squares»), datable around 1225 like the *Flos*, is to be reconnected to the Pisan meeting. The author underlines that this work constitutes a more organic, more complete development of the solution he had given to the first question proposed by *magister* Johannes in Pisa. Among the pages of the *Liber quadratorum*, another character from the court appears, whose personality is better known than that of Johannes, named **Theodore of Antioch**.
- Though four chapters are dedicated to mercantile mathematics, the experience that the mathematician expresses in his work goes beyond the usual mercantile culture: this explains how this text was able to act as a "link between the **theoretical mathematics**, subsequently taught in Universities, and the **practical mathematics** destined to be used by merchants" (Folkerts, 2001).



# MEDICINE

- In 1245, in Melfie, Frederick II dedicated five of his *Constitutiones Melphitanae* to **doctors and medicine**, regulating:
  - the curriculum of studies;
  - the access to the profession;
  - the rights and duties of the doctors.

Frederick introduced the ban on creating partnerships with doctors and allowed the opening of pharmacies only in certain cities. The law also provided for the control over **pharmacists**: for example, we can mention the obliged oath of the pharmacists to operate *sine fraude* (“without fraud”) and to scrupulously prepare the drugs according to the prescription of the doctor (III, 46.8). The constitution III, 48 also shows Frederick's great attention to **ecology and preventive medicine**, with a strong protection for the health of the air and water.



An English translation of the *Liber Augustalis* (another name under which Frederick's *Constitutiones Melphitanae* are known) by the medieval historian James M. Powell.



## MEDICINE

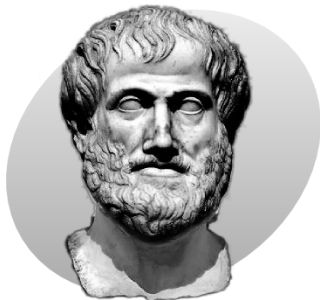
- The **medical rules and duties** of the doctor are also dealt with in the five so-called “medical regulations”. Also the III, 46 regulates the minimum frequency of visits to the sick and the consequent fee. Furthermore, it strictly forbids doctors from making companies with pharmacists. This distinction is probably intended to remedy the conflict between theory and practice that has been discussed.
- Frederick II distinguished his cultural, scientific commitment from the legislative, political one. In his conception, doctors (but not medical professors!) were public officials, just like the many other magistracies created by himself and his grandfather Roger. Meanwhile, at the same time, it tried to maintain the epistemological orientations of his medicine on trajectories not too hostile to the Roman Curia.

# PHILOSOPHY

- In the chronicle attributed to Niccolò Jamsilla (*Historia de rebus gestis Frederici II imperatoris*, «History of the deeds of the emperor Frederick II»), the Swabian Duke is presented as a **scholar of philosophy** and promoter of philosophical studies:

*"He was a scholar of philosophy, which he himself personally cultivated and ordered that it be propagated in his kingdom."*

- The existing documentation shows that the emperor used to surround himself with people of great importance, involved in astrology, mathematics, medicine, etc... He himself appeared interested in the discussion of doctrinal problems of various kinds, from metaphysical ones to cosmological, up to zoological.

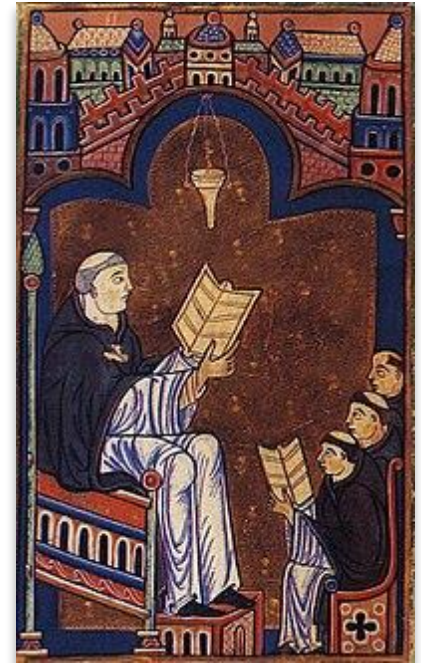


Aristotle of Stagira, paradigmatic philosophical personality to Frederick II. For the drafting of his ornithological treaty – *De arte venandi cum avibus* – the emperor clearly got inspired by Aristotle's *Historia animalium*.



# PHILOSOPHY

- Frederick shared his beliefs with the theologian Hugh of Saint Victor, in whose opinion the very first man lost the gift of immortality because of the **original sin** (of course, this thought is on the same wavelength as Christian anthropology). Indeed, following the tradition, he uses it deeply in the prologue of the *Constitutiones Melphitanae* to justify the origin of civil power: man, created in God's own image, is the worthiest of creatures. As a result of the original sin, "**the principles of the Gentiles**" were created "due to the cogent necessity of things and to the inspiration of Divine Providence", governing men in their associated life as executors of the divine sentence, so that the destruction of men would not bring about that of everything else.



The French theologian Hugh of Saint Victor.

# ORNITHOLOGY



- Frederick II's treaty *De arte venandi cum avibus* («The art of hunting with birds») is divided into six books, dealing with the general habits and structure of birds and **different methods of hunting**. There are about seven copies of the Latin manuscript, the most famous copy being an illuminated manuscript commissioned by his son Manfred, which is now in the Vatican Library in the Bibliotheca Palatina. The manuscript belongs to the two-book version and is illustrated with brilliantly coloured, extraordinarily lifelike, accurate, minute images of birds and the instruments of the art. The Vatican edition includes nearly 900 images of birds.



Some beautiful pictures from the manuscript of the treaty, which is now preserved in the Bibliotheca Palatina.

# ORNITHOLOGY

- This work is notable for the fact that Frederick II mainly confides in **his own observations and experiments**, describing things as they are ("*quae sunt, sicut sunt*"). He experimented with eggs to see if they would hatch only by the warmth of the sun, tried to find out if birds used their sense of smell while hunting by covering the eyes of vultures. Frederick II was familiar with Aristotle's treaties on animals in Latin translation, such as the above-mentioned *Historia animalium* – translated by Michael Scot – or *De scientia venandi per aves* («The science of hunting with birds»), a treaty by the Arab falconer Moamyn which was translated into Latin at his court by *magister* Theodore of Antioch.



Some beautiful pictures from the manuscript of the treaty, which is now preserved in the Bibliotheca Palatina.