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**Towards a critical edition of Fibonacci's *Liber Abaci***

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## **Towards a critical edition of Fibonacci's *Liber Abaci***

by Giuseppe Germano

The following four essays have the aim to present to the public of the interested scholars some of the results and the methodological lines that a group of interdisciplinary research working at the University of Naples Federico II has currently achieved and developed in the course of a study that has been carrying out on the *Liber Abaci* by Leonardo Fibonacci and that is turning out to be long and full of difficulties. These essays show quite significantly the skills and the guidelines of this research group: it is operating in at least three different directives with the same aim to achieve the goal to offer a modern scientific and widely accessible edition of Fibonacci's treatise. These directives can be identified in the linguistic-philological, in the historical-mathematical and in the computer approach: through their synergy, the research group has the following purposes: 1) to establish for the first time a reliable critical text of *Liber Abaci*, as close as possible to its original; 2) to place it, in the light of all the most recent historical and scientific acquisitions, in the cultural context that produced it; 3) to provide it with a commentary that will smooth out the main difficulties of interpretation; 4) to make it accessible to a wide audience of specialists and non-specialists also through all the tools that are now available by the computer science and the digital resources.

The paper by Giuseppe Germano, *New Editorial Perspectives on Fibonacci's Liber Abaci*, summarizes the acquisitions on the current status of the manuscript and printed tradition of Fibonacci's treatise and demonstrates the need of preparing a critical edition of the work that can use the potential of computer science and digital resources. It points out that in the current state of the preparatory work of this edition it's not possible to provide a genuine *stemma codicum* yet, but we can only propose mere hypotheses about the reciprocal relationships of the manuscript witnesses. It ends with an essay of the critical edition in preparation, that is the dedicatory epistle and the prologue of the treatise, which for

their historical and cultural importance have already received both up to now particular attention from the scholars who have devoted themselves to Fibonacci's *Liber Abaci*. The critical text is equipped with an apparatus of variants and is provided with a new and original English translation.

The paper by Concetta Carotenuto, *Observations on selected variants of Fibonacci's Liber Abaci*, after some theoretical argumentation on the textual and exegetical issues of the treatise, discusses the main variants of its prologue in the light of historical and scientific and not only philological skills: a necessary condition, in the specific case of a technical text, to tackle a correct textual criticism. In this context it also provides new perspectives to longstanding issues that had already been the subject of interest and study in the past decades by science historians. It talks also about another significant variant that is placed between chapters II and III of the treatise and, in order to restore the presumed authentic text, it points out that in the current state of the research progress the stemmatic method of the philological science can not be applied with absolute certainty yet.

The paper by Eva Caianiello, *Les sources des textes d'abaque italiens du XIV<sup>e</sup> siècle: les échos d'un débat en cours*, is focused on the controversial position of Fibonacci's treatise in the tradition of Italian abacus texts, joining a debate that has been in progress for some decades and concerns the thorny issue of their sources. In presenting the terms of this debate and in suggesting a possible new point of view of the problem, it underlines in particular its methodological importance, because it emphasised several important issues: among these issues it stands out the need for a proper linguistic interpretation of the ancient texts, that considers the language history and semantics factors, but also the need to interconnect all the methodologies from different domains of competence, such as those of the statistic and philology.

The paper by Ernesto Burattini, *Fibonacci's Computation Methods vs Modern Algorithms*, investigating several calculation methods presented by Fibonacci in his *Liber Abaci*, emphasizes his ability to explain them with clear examples that were also particularly suited for teaching, mainly thanks to the new representation of the Arabic numerical figures, that he had adopted. It aims to show how the calculation methods presented and developed in the Fibonacci's treatise can be translated into modern algorithms and can be implemented on a modern computer to verify the accuracy of their results and to support also in an extrinsic way the philological inquiry on the textual variants of the treatise. To the scientific purpose of this implementation it could also be added a more properly playful and didactic aspect, intended to propose, in a future critical, digital and multimedial edition, the Fibonacci's calculuses in a more modern light, that can be familiar to the modern reader and that can adapt them to the new communication and representation needs.

Thus, of the following four essays, those by G. Germano and C. Carotenuto can be ascribed to the linguistic-philological sphere, the one by E. Caianiello to the mathematical-historical field and the one by E. Burattini to the computer applications. They grant you to obtain a focused panoramic of what are

the methods applied, the difficulties faced and the results achieved in the study that is up to now conducted by this research group on the Fibonacci's treatise; but they also help to point out the value and the need for a multidisciplinary research in order to achieve the common goal of making it adequately available to the scientific community. The first two essays, in fact, in presenting the practical and methodological foundations of philological work dealt with and still to deal with (but also the early results of the research carried out up to now in order to constitute the critical text of the *Liber Abaci*), show that it is impossible to pursue this aim regardless of historical-mathematical knowledge and of the help of the computer science to obtain a proper dissemination and optimization of the results; the other two essays, then, show that the correct establishment of a reliable and clearly interpreted text can not be disregarded, even in their areas of competence.

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