On the Relevance of the Neo-Platonic Theology to Pythagorean Arithmetic Practice

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The Pythagorean arithmetic tradition represents a significant intellectual current, characterised by a specific approach to the construction of arithmetic, which originates in the early Pythagorean practice of *pebble arithmetic* and is an alternative to that of the Euclidean *Elements*. In contrast to the Euclidean style of arithmetic reasoning, the Pythagorean style is proofless visual reasoning over concrete objects of combinatorial character based on finitary recursive definitions [Vandoulakis 2009].

However, in the Neo-Pythagorean works, where this style is practised, arithmetic reasoning is blended with metaphysical ideas of various origins (Platonic, Aristotelian, and others), which are further advanced in other works called "theology of arithmetic." For instance, Nicomachus of Gerasa, the author of the famous *Introduction to Arithmetic*, also wrote another lost work, *The Theology of Arithmetic*, presumably devoted to the metaphysics of arithmetic. A similar work is ascribed to Iamblichus, known as the *Theologoumena Arithmeticae*. Iamblichus also wrote an *Introduction to Arithmetic*, presumably similar to Nicomachus's corresponding treatise. Thus, arithmetic and metaphysics of arithmetic are combined in the Neo-Pythagorean tradition. Furthermore, "theology" itself is systematically advanced by Proclus in his work *The Elements of Theology*, which includes topics relevant to Pythagorean mathematics.

The question arises as to which extent the eclectic Neo-Pythagorean 'metaphysics of arithmetic' is related to the 'empirical' logic underlying the Pythagorean arithmetical practice. We will show that some of these metaphysical views tally with the Pythagorean arithmetical reasoning and could be interpreted as a "Pythagorean philosophy of arithmetic." In contrast, other views are speculative Neo-Platonic advances incompatible with the Neo-Pythagorean style of arithmetic reasoning. They are not derivable by philosophical reflexion upon the Pythagorean arithmetical practice but represent a biased Platonised interpretation of the Pythagorean arithmetic.

References

Vandoulakis, Ioannis M., 2009, "A Genetic Interpretation of Neo-Pythagorean Arithmetic," *Oriens - Occidens* Cahiers du Centre d'histoire des Sciences et des philosophies arabes et Médiévales, 7 (2009), 113-154.