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PROJEKTBERICHT | RESEARCH REPORT

RESEARCH GROUP (D-III-3) MECHANICS

**THE TRADITION OF THE ARISTOTELIAN
MECHANICS: TEXT AND DIAGRAMS**

Research results of the period from
01.01.2009 – 30.04.2012

Members of the research project

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Description of research question, approach and results

Research question

What does the Byzantine manuscript tradition (text and diagrams) of the Aristotelian *Mechanics* look like?

Research methodology and approach

The philological basic research of this group, which was conducted at the Aristoteles-Archiv of the FU Berlin, benefited from the extensive microfilm collection and paleographical and codicological materials of this institution. In addition to the philological analysis of the transmission of the *Mechanics*, the contents of the text are interpreted in a broader context of natural philosophy, ancient mathematics, and the history of science.

The initial approach to the Aristotelian *Mechanics* was primarily philological; in the course of the project, however, there was an increased interest in the philosophical and mathematical aspects of the text. The research in this group communicated with several projects in the areas D-II-1 and D-II-2 focusing on the mathematical aspects of Aristotle's general theory of motion. Mechanical concepts are also highly relevant to Aristotle's theory of animal motion as expounded in *De Motu Animalium* and *De Anima*.

Results

Joyce van Leeuwen, in her Ph.D. project, undertook a critical examination of all extant manuscripts of the Aristotelian *Mechanics*. The aim of this dissertation is twofold: in the first part of the thesis the textual tradition of the Aristotelian *Mechanics* is examined, whereas in the second part the focus is upon the diagrams that were transmitted to us in the Greek manuscripts. These two parts are interwoven, in that the analysis of the manuscript diagrams is not only of significance in relation to the interpretation of the mechanical principles, but it is also important for a new constitution of the text.

Moreover, the preserved diagrams should be considered as an important part of the reception of the treatise and are invaluable to our knowledge of the history of ancient mechanics.

Important results from this dissertation include: (1) showing that all editions of the *Mechanics*, including the latest edition by Maria Elisabetta Bottecchia (1982), contain traces of the Byzantine paraphrase of the text by Georgios Pachymeres. In a new critical edition of the *Mechanics* these paraphrastic traces need to be separated from the authentic Aristotelian text; (2) establishing a *stemma codicum* that constitutes a sound philological basis for a new edition of the *Mechanics*: all 31 extant manuscripts of the treatise were completely collated, the manuscripts were divided into three manuscript families, and subsequently the new stemma codicum of the treatise was established; (3) showing that the manuscript diagrams have their origins in the Byzantine period and should be regarded as an important part of the Byzantine reception of the treatise; (4) producing a first critical edition of the diagrams contained in the Greek manuscripts.

Discussion of the results in the light of current research

In recent years there is an increasing interest in the Aristotelian *Mechanics*; many publications rely, however, on certain wrong assumptions about the transmission of the text and its diagrams. A critical examination of the complete manuscript material is therefore necessary. This lacuna is filled by van Leeuwen's dissertation on the transmission of this text. Her work has shown the need for a new critical edition of the *Mechanics*, since all editions of the text, but especially the latest edition by Bottecchia (1982), are influenced by the Byzantine paraphrase of the *Mechanics* by Pachymeres.

Further, van Leeuwen examined for the first time the diagrams contained in the Greek manuscripts of the treatise. This part of her research was conducted at Stanford University during a research stay with Professor Reviel Netz. Netz's authoritative work on the practices of diagrams in Greek mathematical texts points to the significance of the by most scholars unnoticed diagrams in ancient scientific texts.