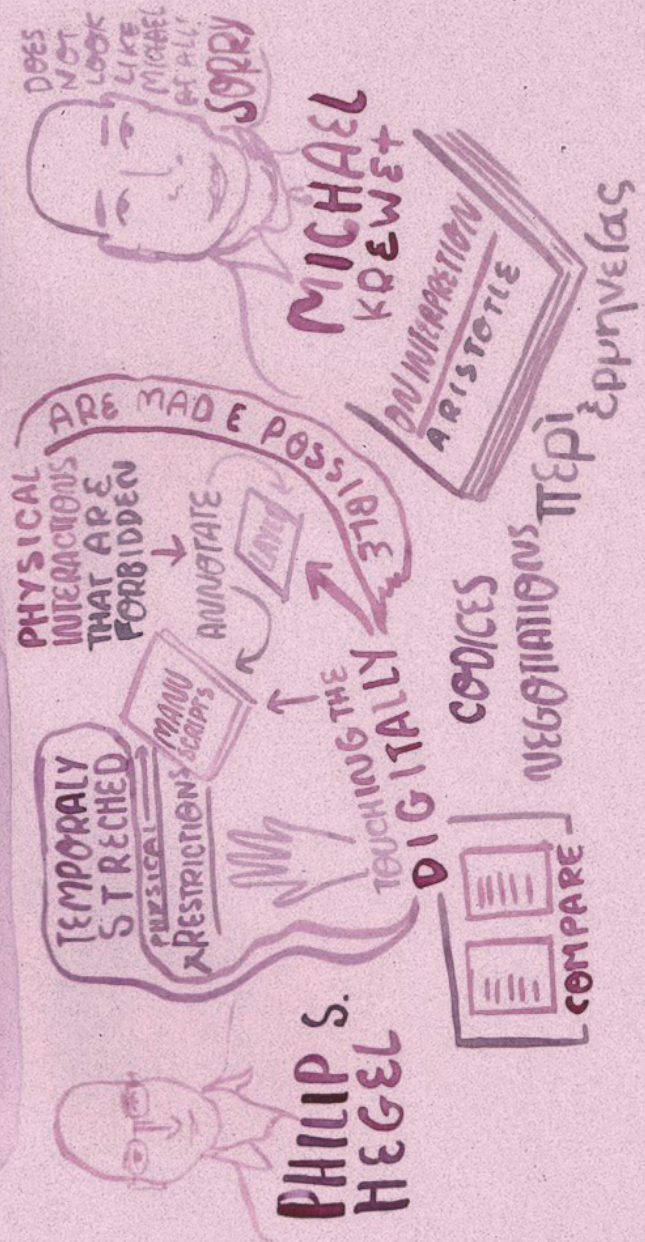SKETCHNOTE BY ELVIA VASCONCELOS OF PHILIPP HEGEL AND MICHAEL KREWET'S
PRESENTATION WTIHIN THE WORKSHOP "WHAT IS THE DIGITAL DOING? A WORKSHOP
IN THE INTERFACE", NOVEMBER 2020.

TEXTUAL CRITICISM AND TEXTUAL TRANSMISSION AS HISTORY OF KNOWLEDGE:

Digital Annotations on *De Interpretatione*

"Similarly to a digital user interface, the medium of the codex allows certain interactions between the material object and the human beings who read and write it."

Philipp Hegel and Michael Krewet

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1. Knowledge Transfers and Knowledge 'Oikonomies'

The history of handing down Aristotle's Organon, that is of the logical writings of the Greek philosopher, namely of his work *De interpretatione* is considered to be complex because of its high degree of textual contamination. 'Contamination' means in this context that a handwritten copy of a text contains and combines variants or errors of different copies of the text. This frequently makes it difficult for scholars in the present day to trace which manuscripts exactly a scribe might have had on his desk while copying the text. But on the other hand, the high degree of contamination and the decisions for one variant in a single passage of the text against another, show that textual transmission was accompanied by the effort, underlying the constitution of a text, to make sense in every detail.

Facing this situation, it may seem hardly expedient to devote attention not only to the text but also to its paratexts. But if the objective is not only to reconstruct the text as Aristotle has taught or intended it, but to keep track of the text as a subject of reciprocal and multidirectional knowledge transfers, then these paratexts, diagrams and glosses are indications of the scholars' practical engagement with the text on the surface of the codex. They also represent a new context in which the text is now read and studied. They bear witness to how this text was explained and interpreted in manifold ways and how these explanations and interpretations can have their own effects on the tradition of the understanding of the text, but also on the transmission of the text when a reading is preferred, a model is corrected or a gloss is moved into the Aristotelian text itself. The significance of *De interpretatione* is not only reflected in about 150 surviving Greek manuscripts — which is a high number for an ancient Greek non-christian text — but also in the glosses and commentaries

to the work and in the 'restatement' of its arguments in diagrams that accompany the text in its tradition. Inclusion of these additions in the text-critical work and within the studying of textual transmission increases what is already an extensive amount of material, but also enables conclusions about the transmission of the text that could not be drawn based on the textual findings alone. Furthermore, this would allow insights into the philosophical and especially educational use of the work and therewith into a history of knowledge that ranges particularly, though not exclusively, across the entire Mediterranean area and spans from antiquity to the early modern period. However, since the consideration on commentaries, glosses and diagrams boosts the effort and the amount of material significantly, digital methods like layout analysis, annotation and retrieval can, as should be shown on the basis of examples, be helpful to uncover text-critical and cultural-historical interrelations.

This connection between textual transmission, textual criticism and the history of knowledge is centred on the idea that epistemic repositories are changing continually with different speeds and in different modi. Although these movements are not necessarily known, they are made a subject of discussion or affirmed in self-descriptions and in the descriptions of others of the historical constellations.[1] These epistemic repositories cover sciences in an institutional sense as well as knowledge outside this social framing. They refer to objects in a general sense and appear with certain, absolute or relative, explicit or implicit claims of validity that are negotiated in epistemic practices.

In this context, alterations of knowledge are understood as transfers, in which knowledge is moved from one context to another and in

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1. The Collaborative Research Centre 980 "Episteme in Motion" examines alterations of knowledge on the basis of exemplary cases in European and Non-European culture before the so-called modernity.

which changes on both sides (the knowledge itself and the new context of the knowledge) can occur. These transfers do not act in one direction only, but interact with the original context and a multitude of human and non-human "actors". This means for the examination of the tradition of texts and ideas that the formation of traditions can be defined and described as a network of reciprocal and multidirectional processes, in which the new context or later tradition can effect changes in the original context of the knowledge and in the fundamental texts and can take up material and intellectual contact with them and with its direct predecessors.

The term and neologism "knowledge oikonomy" aims to incorporate system-generating and -modifying effects of such epistemic processes. According to Nora Schmidt, Nikolas Pissis and Gyburg Uhlmann, with this term the issue "of the *conditions*" is addressed, "*under which these reciprocal dynamics lead to structural stabilization*, such as formation of institutions, the generation and normalization of genres, the hardening of text traditions into a canon or the evolution of an iterative practice into a rite."[2]

This dynamic of knowledge transfers and "oikonomies" can be put in concrete terms on the basis of the paratexts to the Aristotelian writing *De interpretatione*. By paratexts we mean in this context diagrams, scholia, and glosses that have accompanied the Aristotelian text in the manuscripts. To a degree, they have their own tradition that can throw a light on the transmission of the text and the way the text was understood. This will be demonstrated in a first example that considers paratexts as a step in a text-critical heuristic.

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2. Nora Schmidt, Nikolas Pissis, and Gyburg Uhlmann, Wissensoikonomien, in: *Wissenoikonomien*, ed. Nora Schmidt, Nikolas Pissis and Gyburg Uhlmann (Wiesbaden 2021), pp. 1–12, here p. 4; our translation and highlighting.

In a second example, we will consider paratexts as a step in a heuristic of the history of knowledge that draw conclusions from single transfer or a number of transfers of texts, images and knowledge to the "oikonomical" circumstances – i.e. the contexts or means which have facilitated the knowledge transfer. There were e.g. philosophical schools and traditions in which diagrams, scholia, and glosses were used, absorbed and changed for the explanation of arguments of the Aristotelian *Organon*.

In both examples and heuristics, we used digital tools as methodological enhancement. We address a repository and several tools for layout analysis, annotations and retrieval of digital images. We demonstrate their role in this research process without going into the details of technical implementation and data modelling.[3] Instead, we demonstrate and explain the entanglement of concepts from the history of philosophy and knowledge, philological endeavour and digital tools on the basis of the examples mentioned. We touch upon the above-mentioned tools *quasi en passant*, finally summing up their respective methodical integration in the scholarly cognitive and research process.

2. Paratexts as a Step in a Text-critical Heuristic

In the case of *De interpretatione*, paratexts consist primarily of diagrams and glosses that have continually accompanied the text in various forms. When scholars are only interested in the tradition of

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3. These issues are discussed at other places. For the layout analyses, see Hannah Busch, and Swati Chandna, eCodicology, in: *Codicology and Paleaography in the Digital Age,* vol. 4, ed. Hannah Busch, Franz Fischer and Patrick Sahle (Norderstedt 2017), pp. 3–23. For the annotation service, see Germaine Götzelmann and Danah Tonne, Aristoteles annotieren, in: *Bilddaten in den Digitalen Geisteswissenschaften*, ed. Canan Hastik, and Philipp Hegel (Wiesbaden 2020), pp. 53–66. For the vocabulary service, see Felix Ernst, Towards a Similarity Algorithm for Controlled Vocabularies within the Digital Humanities, in: *A Semantic Web Primer*, third edition, ed. Grigoris Antoniou, Paul Groth, Frank Van Harmelen, and Rinke Hoekstra (Cambridge, Mass. 2012), pp. 179-188.

the Aristotelian text – because the research on the tradition of the text alone is already regarded as complex in and by itself due to the already mentioned high degree of contamination – paratexts may seem to be incidental, if not superfluous or disruptive. The tradition of the text itself is considered to be complex enough. With its 150 surviving copies, *De interpretatione* is the most transmitted writing of the antique philosopher besides his *Categoriae*.[4] The copies derive from a relatively long period of time from the ninth to the seventeenth centuries, and were spread across the entire Mediterranean (and further) since the *Organon* to which they belong has been a central subject of education on logic in many places and for centuries.

Since many scribes had often more than one text version in front of them, contaminations arrived early in this case. The scribe selected different textual variants after critical examination and combined them into new versions. So, the Alexandrian commentator Ammonius (fifth century) put his compiled text and his discussion of several *lectiones* in front of his exegesis, already acknowledging then that so many variants of the text were in circulation.[5]

Among experts, the textual tradition of the *Organon* which includes the textual transmission of *De interpretatione* is said to be so complex and so inconclusive, that there are voices who believe that even the stemmatological relationship between the oldest manuscripts cannot be determined with certainty. *Inter alia*,[6] the situation is inconclusive because there is a lack of significant binding and

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4. For a more detailed overview, see Michael Krewet, and Philipp Hegel, Diagramme in Bewegung, in: *Bilddaten in den Digitalen Geisteswissenschaften*, ed. Canan Hastik and Philipp Hegel (Wiesbaden 2020), pp. 199–216, here p. 203–208.

5. See *Ammonius in Aristotelis de interpretatione commentarius*, ed. Adolf Busse (Berlin 1897), pp. 24–28, here p. 8.

6. Meaning: among other things.

splitting errors[7] in this earliest tradition of the text. Beyond 'errors' *sensu strictiore*[8] in many cases textual variants that spring from more than one manuscript can be found and indicate a contamination. The examination of the entire filiation of the *Organon* appears disproportionate to a researcher's lifetime, as Diether Roderich Reinsch states.[9] Until the present day, it cannot be considered as completed as a whole.

By this additional effort to examine paratexts from a perspective of textual criticism, the problem of human finiteness is not solved. Despite all utopian ideas, even digitalisation will not change this. Although it is no consolation for each and every person, what digital storage can do is initially help unite historical sources or, more accurately, their digital surrogates.

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7. Tracking such 'mistakes' provides one way to identify relations between manuscript versions. For this terminology cf. Paul Maas, *Textkritik* (Leipzig 1957), p. 27.

8. Meaning: in the narrow sense.

9. Diether Roderich Reinsch, Fragmente einer *Organon*-Handschrift vom Beginn des zehnten Jahrhunderts aus dem Katharinenkloster auf dem Berge Sinai. *Philologus* 145 (2001), pp. 57–69, here p. 63: "Dem *Organon* ist [...] im Gegensatz zu einer ganzen Reihe von anderen Traktaten aus dem Corpus Aristotelicum, bei welchen die Zahl der Handschriften nicht von vornherein in krassem Mißverhältnis zur Arbeitskapazität eines einzelnen Forschers steht, bisher noch nicht die Ehre einer überlieferungsgeschichtlichen Monographie zuteil geworden, und eine solche wird wohl auch noch einige Zeit auf sich warten lassen." "In contrast to a whole series of other treatises from the Corpus Aristotelicum, in which the number of manuscripts is not from the outset grossly disproportionate to the working capacity of an individual researcher, the *Organon* has not yet been accorded the honour of a monograph on the history of transmission, and such a monograph will probably be some time in coming'" (our translation). Similarly, Elio Montanari, *La sezione linguistica del Peri Hermeneias di Aristotele*, vol. 1 (Florence 1984), p. 49: "Non solo si deve segnalare l'assenza di errori significativi comuni alla totalità della tradizione, ma è senz'altro lecito revocare in ragionevole dubbio l'esistenza stessa, nei singoli testimoni del complesso tradizionale del *Peri hermeneias* qui preso in esame, di errori che possano esser definiti criticamente 'significativi'. Le varianti offerte consistono infatti per lo più in spostamenti – in linea di massima ammissibili – nell'ordine delle parole; in aggiunte – ovvero omissioni, a seconda dello stato del testo che sia posto come termine di confronto – di elementi esplicativi o integrativi spesso esigui, e comunque né indispensabili né, a rigore, erronei; nell' uso di espressioni – grammaticali, sintattiche, semantiche – latamente sinonimiche", and p. 50: „Si deve infine segnalare che il panorama delle lezioni tramandate dai testimoni fino all'XI secolo è sufficientemente ampio, complesso, variegato ed intricato da suggerire perentoriamente di esser stato generato da un'incessante ed illimitata rete di rapporti non univoci, verisimilmente concretizzatisi non solo in relazioni orizzontali più o meno occasionali, ma anche nell' esistenza di più *editiones variorum*. La tradizione del *Peri hermeneias* deve pertanto esser riguardata come affetta da un'estesissima ed irrimediabile contaminazione, non meno grave ed inestricabile per il fatto di non poter essere asseverata dall'opportuna disposizione di errori significativi."

If the lack of time to solve highly complex research challenges is not an outward part of the problem, this is a part of its solution. Firstly, with digital methods the consultation of the digital surrogates is possible almost simultaneously in a way that is normally not given for the materials themselves. Secondly, research results can be offered in a modified and new way to other and future scholars. This is worth mentioning because, given the willingness of researchers, marginal and in any case fragmentary findings can be archived in a repository that would probably not be published or otherwise safely stored. Even if results had been stored on paper, although they do not clarify the filiation of the *Organon* or *De Interpretatione in total*, a phenomenon will likely recur that has been observed by looking at the manuscripts. As unique pieces, they stay separated and can only be brought together with a bigger expenditure of time. At least this amount of time can be reduced with digital means. By storing these findings in a repository, they can survive the end of a project or the life-span of a scholar, and in combination with digital images, the research process can become more enduring and transparent.[10]

Thirdly, digital images can be used in other manners than would be possible for the originals. They can undergo automatic layout analyses on a large scale. In the results of this procedure, textual variants can be marked up and glosses, scholia, commentaries, and diagrams can be transcribed, translated and scholarly described close to the text. Finally, these annotations can be searched, analysed, and presented in multiple different ways.[11]

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10. Cf. Michael Krewet, Philipp Hegel, Germaine Götzelmann, Danah Tonne, and Sibylle Söring, Aristoteles auf Reisen, in: *Forschungsinfrastrukturen in den digitalen Geisteswissenschaften*, ed. Martin Huber, Sybille Krämer, and Claus Pias (Frankfurt am Main 2019), pp. 77–87, here pp. 81–84.

11. Cf. Michael Krewet, Jochem Kahl, Germaine Götzelmann, Julia Hübner, Philipp Hegel, Sibylle Söring, and Danah Tonne, Digitale Erforschung epistemischer Verflechtungen, in: *Wissenoikonomien*, ed. Nora Schmidt, Nikolas Pissis, and Gyburg Uhlmann (Wiesbaden 2021), pp. 135–149, here pp. 137–141.

It is especially digitalisation that enables interactions that are not possible with originary manuscripts. With digitalisation, the book corpus in a sense vanishes, and is transmuted into a new digital corporeality. You cannot feel and smell the book any longer, but it rests in a new and distinct form and can be transformed into a visual shape, into an image. One may bemoan that the "aura" of the unique manuscript is lost, but it is this very "profanity" of bits and bytes that facilitates a physically close contact with the codex that is not given or at least institutionally forbidden in a reading room. In the digital form, one can extensively annotate in ways that might even be similar to those of persons in antiquity or the Middle Ages. At the same time, the unique manuscript remains safely unaltered. The distance in the reading room, possibly prescribed by respect for the object, fades and is safeguarded at the same time.

The codex and its digital image have different medial and material affordances. The digital image creates and increases certain options for interactions with the book by transcending this materiality and mediality. The ancient and medieval book was, as has already been mentioned, a textual space for social interactions of its own, through which human beings and ideas were connected over long periods of time and across cultural borders. Later readers could annotate the transmitted texts at other places.

This is now possible in an intensified mode with digital images because the annotations are not limited to the space of the book corpus when they should stand physically close to the object. They can be accumulated in ever new layers on the image. In this case as well, there are limits, but they are situated in other dimensions. Because the digital image is not the unique manuscript, the digital annotations are not temporarily and spatially restricted in the same

way. More than one person can annotate simultaneously and in completely different modes and more than one person can annotate the same material over long ranges of time.

The conceptual and metaphorical range of the term 'interface' can be an invitation to call the manuscript by the same term.[12] Similarly to a digital user interface, the medium of the codex allows certain interactions between the material object and the human beings who read and write it. The mentioned paratexts prove this. But unlike the computer the inner states and processes of the medium are not hidden from the 'user' in the same way.[13]

Within certain limits, however, graphical user interfaces of digital tools and publications can often be considered as paratexts in a broader sense. They accompany the text and make it accessible for human reception and other kinds of interactions.[14] Among other things, they undertake tasks that are performed by the title, the preface, the notes and the indexes of a book. Similarly to the diagrams and scholia in handwritten books, they are results and

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12. Sabine Wirth, Between Interactivity, Control, and 'Everydayness', in: *Interface Critique*, ed. Florian Hadler and Joachim Haupt (Berlin 2016), pp. 17–35 highlights the "richness and ambiguity of the term" (p. 17) . See also Konstanty Szydłowski, The Conceptual Debts and Assets of Interface, in: *Interface Critique*, ed. Florian Hadler and Joachim Haupt (Berlin 2016), ho states: "It is used and misused to describe virtually everything" (p. 39).

13. The connection between 'interfaces' and 'black boxes' is often stressed. Cf. for example Siegfried Zielinski, Art and Apparatus (A Flusserian Theme). *Interface Critique* 1 (2018), pp. 46–54: "The common boundary of (media) people and (media) apparatus is one example of what we call an *interface*. At one and the same time it divides and connects two very different worlds […]. You are to use a computer without being aware that you are dealing with an algorithmically constructed computation and simulation machine. […] Computers are being engineered for their users to resemble a *camera obscura*, as a black box" (p. 48).

14. See the circumscription in Gérard Genette, *Seuils* (Paris 1987), p. 7: "ce texte se présente rarement à l'état nu, sans le renfort et l'accompagnement d'un certain nombre de productions, elles-mêmes verbales ou non, […] dont on ne sait pas toujours si l'on doit ou non considérer qu'elles lui appartiennent, mais qui en tout cas l'entourent et le prolongent, précisément pour le *présenter*, au sens habituel de ce verbe, mais aussi en son sens le plus fort: pour le *rendre présent*, pour assurer sa présence au monde

conditions of epistemic processes. They belong to the material prerequisites and possible constraints of a knowledge *oikonomy* of which digital images of the manuscript pages and digital annotations can be a part.

These digital annotations can, also in conjunction with metadata and controlled vocabularies, be used to contextualize and understand annotations of earlier centuries in various ways. In comparison with the text that they accompany, earlier paratexts have their own temporal arrangements in layers and their own speed. They have their own speed because they have changed in other rhythms than the text. They have their own temporal layers because they accumulate the philological, philosophical, and didactic adaptions of this manuscript and text. Although frequently only indirectly, they show the history of reception of *De interpretatione*. They show how the text was embedded into new contexts of interpretation, with which arguments and authorities, with which questions and doubts it was confronted.

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sa 'réception' et sa consommation, sous la forme, aujourd'hui du moins, d'un livre." / "this text is rarely presented in an unadorned state, unreinforced and unaccompanied by a certain number of verbal or other productions [...]. And although we do not always know whether these productions are to be regarded as belonging to the text, in any case they surround it and extend it, precisely in order to present it, in the usual sense of this verb but also in the strongest sense: to make present, to ensure the text's presence in the world, its "reception" and consumption in the form (nowadays, at least) of a book." (Jane E. Lewin. Gérard Genette: Paratexts. Thresholds of Interpretation. Trans. by Jane E. Lewin, Cambridge: Cambridge University Press 1997, p. 1.) It can be added, that today's form of texts is not rarely the surface on a screen. The interaction between computers and human beings is a central aspect of interfaces. Cf. Wulf R. Halbach, *Interfaces* (Munich 1994), pp. 156–157, who takes Ivan Sutherland's Sketchpad as an example for a tool that "changes, facilitates and accelerates the 'manipulation' of data and increases the degree of interactivity" (our translation). The access of digital annotations by visualisations in combination with texts and metadata in the examples given above fulfils a similar function by enabling and directing certain options for actions. The connection of interfaces and paratexts pointed out here differs from that which Alexander R. Galloway sees in *The Interface Effect* (Cambridge 2012), p. 37–39: "The paratextual (or alternately, the nondiegetic) is [...] merely the process that goes by the name of outering, of exteriority." Discussing an example, Galloway describes this kind of interfaces as one where "no attempt to hide the interface" is made and a "disorientation of shattered coherence" can be found.

In that respect, they form a basis for the description of knowledge transfers as well as *oikonomical* interweavings of knowledge. Movements inside the traditions of texts and paratexts in the age of manuscripts and their copies in many cases indicate movements of specimens in time and space and can point to epistemic centres. A clue for single, potentially reciprocal knowledge transfers and for a stemmatological relation can be found in the case of a diagram handed down to us in the manuscripts Vindebonensis Supplementum Graecum 67, Parisinus Graecus 1971, and Urbinas Graecus 56.[15] Between manuscripts that have common paratexts, a stemmatological kinship can be presumed even if this might not be assumed on the basis of the Aristotelian text alone.

In these manuscripts, there is a cross-shaped diagram with a striking error. It represents the four possibilities of correct and wrong propositions. Propositions are correct if they assert something that is the case or if they state that something is not the case that is actually not the case. A proposition is wrong if it states something that is not the case or if it states that something is not the case that is actually the case. The diagram illustrates these possibilities on the basis of the propositions that Socrates is just or that he is not. This example probably derives from the commentary of Ammonius mentioned above.

Obviously, negation plays an important logical role in this context. Therefore it is striking that it is missing at exactly this place in the Viennese manuscript. At the place that should illustrate the wrong proposition stating something is not given that is actually the case, this example is given: "Socrates is just." But this is, as the other

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15. For more details of this example see Krewet and Hegel, Diagramme, pp. 209–214.

examples in the diagram show, the statement that is assumed to be true. So clearly and according to Aristotle's text and to Ammonius' commentary, this is a true proposition, and the expected negation is missing in this diagram.

Because the diagrams are now recorded and transcribed digitally, it is possible to search for other instances of this philosophical mistake in the entire manuscript tradition. It shows that it must be regarded as a text-critical mistake, too, as far as the diagram itself is concerned. In some manuscripts the negation and thus the correct diagram can be found. But the negation is also missing in the mentioned Parisian and Vatican specimen. It was assumed before as a result of a mere comparison of the copied text in the manuscripts that there is a kinship between these two manuscripts, but not between the Viennese manuscript with the other two because it does not show many of the same errors and same variants of the Aristotelian text. Thus, a stemmatological connection between the Viennese manuscript on the one hand and the Parisian and the Vatican on the other hand was not presumed based on the collations of the Aristotelian text in these manuscripts until now.

If different scholars from different places have worked on the transcriptions of the paratexts in the same repository, a scholar can also find the transcriptions of diagrams which they have not transcribed themselves. Thus, such digitally performed research opens new horizons for transregional collaboration on the same complex research question. To overcome the last doubt about the kinship between the three manuscripts as far as possible, the likewise transcribed glosses of the manuscripts can be compared, and it can be seen for example that the extensive glossing of the first chapter overlaps nearly completely in these documents.

This example can also show that such text traditions as knowledge transfers can be reciprocal and that this increases the stemmatological difficulties.[16] For the scribe of the Viennese manuscript did not only copy the text and the paratexts from their models into their own manuscript but, as the handwriting suggests, also reciprocally exchanged variants of the text in the manuscripts. To mention only one example: he undertook an erasure at another place where the Parisian reading seems to have been more plausible for them. Namely, they modified *ἀπόφανσις* to *ἀπόφασις*.[17] Therefore the scribe was responsible for a contamination in this case. Digitally performed research can help us to find such origins of contaminations more easily.

In this argument, digital means were used methodologically at two stages. In the first case, the application is heuristic. The mistake in the diagram triggered a new search based on the digital annotations that raised the hypothesis that there is a stemmatological relation between the three manuscripts. The second application of digital means is evaluative. Used to affirm or falsify the hypotheses based on the findings in the glosses, the digital means serve for the creation as well as for the verification of the hypothesis. Insofar as the relation between three manuscripts could be affirmed (and as the example of the erasure indicates), not only could further hypotheses about the reciprocal knowledge transfer be raised, but also hypotheses could be posed about the *oikonomical* praxis of knowledge when dealing with these manuscripts.

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16. Stemmatology is the general term used here to describe the relationship between manuscripts. The guiding principle is the interest in which manuscript is a copy of which other. Stemmatological difficulties therefore refer to the difficulty of finding this relationship.

17. Meaning: assertive sentence.

3. Paratexts as Steps in a Heuristic of the History of Knowledge

The first example demonstrates how examination of diagrams and glosses contributes to textual criticism and understanding for the transmission of the text. However, the first example can also gesture toward the relevance of the philological, philosophical and didactic practices that were exercised in various places and periods by actors, who are only partly known by name, and that have been consequently inscribed into the material of the textual tradition. A second example should demonstrate or at least outline this potential relevance of paratexts and their digital exploration for the history of knowledge.

The glossing of and commentating on manuscripts are, as previously described, manifestations of social, temporally elongated textual interactions that follow specific rules and purposes. Similar to a virtual research environment, the corpus of the codex facilitates certain interactions with the body of the philosophizing human being and excludes others. Furthermore, cultural norms and usages shape the handling of texts and paratexts, and the textual tradition shows the dynamics of this handling. It shows different solidifications of statements, examples, and ideas in different layers of time. All this can provide clues for specific *oikonomical* entanglements of knowledge that can transgress temporal and spatial, social and cultural boundaries.

In correspondence with the significance of the manuscripts of the *Organon* for the logical education, their material and medial appearance were often designed in a way that they leave extensive space between the lines and at the margins that can be filled up with glosses, commentaries, and diagrams over longer periods over time.

Thus, the single folium became a place of social, temporally extended interactions, *inter alia* (among other things), of teaching, and learning.

The diagrams took different shapes and had different functions. Some express notional and conceptual distinctions, some others illustrate partly interwoven syllogisms. They might have had different didactic purposes and they may derive from different phases of the education. Thus, they can also allow certain, albeit limited, insights into the dynamics of teaching practices. In this case, they do not necessarily hint at certain schools with their different views and educational procedures, but possibly to certain steps that a prospective scholar had to pass during his curriculum or to different groups of readers.

For example, diagrams for notional and conceptual distinctions concerning *De interpretatione* could visualise exactly the terminological differences that are introduced and explained in this passage of the Aristotelian text. They represent the distinction and the text, but they do not question it whereas syllogism diagrams exceed the content of *De interpretatione* insofar as these figures of conclusions were, as a general rule, and for example in the Byzantine context, only introduced in the subsequently covered *Analytica Priora*, a further writing of the *Organon*.[18] That is why they would require knowledge that students, at least in these curricula, were not yet familiar with at this point of their education in the Aristotelian logic.

Against this backdrop, it is remarkable that there are nevertheless syllogism diagrams with direct reference to the content of

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De interpretatione and that accompany its textual tradition. The commentary of the so-called "Anonymous Coislinianus" that was widespread in Byzantium is instructive for this finding.[19]

Anonymus Coislinianus shares the view of some late antique authors that *De interpretatione* is a writing of a difficult kind. It was considered to be unclear—at least for beginners in logical studies.[20] But he rejects the opinion, which some scholars had likely espoused, that Aristotle wrote cryptically to conceal his knowledge. If that had been the case, says the Anonymus Coislinianus, Aristotle could have remained silent. Anonymus Coislinianus counters that Aristotle would have rather given the "knowledgeable lover of philosophy" an opportunity to distinguish themselves. Conversely, the beginner would have great difficulty to understand the text.[21]

The fact that the Aristotelian text was also studied by beginners can explain why there are more simple diagrams that often attend the text. The teachers saw the need to illustrate and enlighten the difficult and often unclear writing. Furthermore, such a standpoint, as the Anonymus adopted it, indicates that the curricular order in Byzantium at this time poses didactic problems.

In contrast to the beginner of philosophy, for the "knowledgeable lover" the text becomes comprehensible by his knowledge of other Aristotelian writings like his treatise *De anima*. The knowledgeable reader can assign themselves the task to clear the text up with their knowledge. Conversely, for the beginner it could be a motivation

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19. Anonymus Coislinianus, *Ἐξήγησις συντομωτάτη καὶ σαφεστάτη εἰς τὸ Περὶ ἑρμηνείας*, ed. Michael Krewet. Textkritische Editio Princeps (Teil I), CAGB digital 2022 (added 2023). https://cagb-digital.de/texte/cagb7783376, access: December 2, 2024, 12:00pm.

20. Anonymus Coislinianus, in int., Proöm 1.9.1: "ὁ δὲ χαρακτὴρ ἰσχνὸς καὶ πάνυ ἀσαφής".

21. Ibid.: „χρῆται δὲ αὐτῷ οὐχ ὥς τινες φασὶ βασκαίνων τὰς τούτων μὲν οὐσίας ἡμῖν· οὐδὲ γὰρ ἂν ὅλως εἶπε περὶ τούτων τι· ἀλλ᾽ ὡς δείξων τοὺς γνησίους τῆς φιλοσοφίας ἐραστὰς κεχωρισμένους τῶν νόθων, οἷς σπουδῇ καὶ μελέτη πάντα ληπτὰ γίνεται".

to follow up with the other writings of the antique Greek philosopher.[22]

Thus, the paratexts to *De interpretatione* show different transfer movements that correspond to the didactic dynamics of this historical context with its curriculum and its understanding of the Aristotelian writings. Many of the syllogism diagrams that have been inserted into the Byzantine manuscripts were added by hand from the 13th or 14th century. Therefore, they originate from the time, in which also the commentary of Anonymus Coislinianus was widely spread and during which many copies of Aristotle's writings are dated. At least in those cases in which the syllogism diagrams were not simply copied from a model, this is a testimonial for the practice that knowledge that was learned only after studying the treatise *De interpretatione* was applied to this text, perhaps as an exercise, perhaps as a critical examination of its arguments.

Although it must remain undone at this point, such a kind of study could be undertaken on single syllogisms of the various forms. But at least, it may serve as an example of how the analyses of the different layers of the paratexts of *De interpretatione* can help to gain insights not only into single knowledge transfers but also into the practice of philosophical schools and their instructions that could perhaps be described as an "oikonomia" of knowledge.

For such a study, digital annotations, controlled vocabularies, and metadata can be heuristically helpful to look for the instances and the distribution of diagrams of single conceptual and notional distinctions and syllogism diagrams in a complex text tradition. These instances and distributions become understandable only if it is

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22. See for this example ibid., ad cap. 1.

possible to embed them into their historical and cultural context. This could only be hinted at in this essay. Further findings from the search in digital annotations on the paratexts can strengthen or weaken such hypotheses, similarly to the results of the text-critical examination of the main text itself. In this context, the single text-critical finding can become a clue to stabilisations and movements in the history of knowledge, and textual criticism as well as textual transmission can become a part of their historical reconstruction.

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‹END›

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