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### Complementarity – a concept possible to be achieved in document analysis?

The concept of complementarity is usually associated with the Danish physicist Niels Bohr who formulated it as a basic principle of quantum theory for the first time in 1927. It refers to effects such as the wave-particle duality, in which different measurements made on a system reveal it to have either particle-like or wave-like properties. Both properties are necessary to gaining complete knowledge of the phenomena; they are complementary to each other but, at the same time, they also exclude each other.

Today the principle ideas of complementarity are used in a number of fields beside physics: philosophy, psychology, economics, molecular biology, and systems thinking. However, there is no multidisciplinary definition of this term. In the *Historical Dictionary of Philosophy*, Klaus M. Meyer-Abich writes:

<K.> heißt die Zusammengehörigkeit verschiedener Möglichkeiten, dasselbe Objekt als verschiedenes zu erfahren. Komplementäre Erkenntnisse gehören zusammen, insofern sie Erkenntnis desselben Objekts sind; sie schließen einander jedoch insofern aus, als sie nicht zugleich und für denselben Zeitpunkt erfolgen können.<sup>1</sup>

In an article titled "Documentation in a Complementary Perspective" (2004)<sup>2</sup>, Niels W. Lund introduced the notion of complementarity as a central concept in documentation analysis which he traces back to Niels Bohr and his quantum theory. Initially, Lund applies the concept of complementarity to the concepts of information, communication and documentation in order to demonstrate that although all three focus on various aspects, none of them is more important than the others; they really complement each instead: "[...], one can see all three concepts as complementary to one another, describing the same phenomenon in three different ways emphasizing three different, but all necessary, aspects of a message. Consequently messages are just as much information as they are documentation or communication."<sup>3</sup> Using the example of a book, Lund makes one thing clear: while social

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<sup>1</sup> Joachim Ritter und Karlfried Gründer (Hrsg.): *Historisches Wörterbuch der Philosophie*. Bd. 4 (I-K). Basel 1976. p. 934: "<C.> is the term for the collection of various possibilities of experiencing the same object as different objects. Complementary perceptions belong together in as far as they are perceptions of the same object; they exclude each other, however, in as far as they do not occur together and at the same point in time."

<sup>2</sup> Niels W. Lund: "Documentation in a Complementary Perspective". I: *Aware and responsible: Papers of the Nordic-International Colloquium on Social and Cultural Awareness and Responsibility in Library, Information and Documentation Studies (SCARLID)*. Edited by Rayward, W. Boyd. Oxford 2004. pp.93-102, p. 95.

<sup>3</sup> Niels W. Lund: "Document = Doceo + mentum: an outline of a dynamic document theory". p. 5

aspects stand in the foreground of the communicative domain, information focuses on the content and with it, the mental structures. In contrast, documentation as well as LIS in the conventional sense focuses largely on the materiality of a book. Lund argues that we can talk about "three complementary, but exclusive features of the description of the book. One is not making a synthesis, but three complementary closures around the book, making a joint completion of the description."<sup>4</sup> While Lund initially links the Bohr's principle of complementarity with the three concepts of communication, information, and documentation, he elicits three complementary ways of looking at a document such as a book: 1) document as a 100 percent physical phenomenon; 2) as a 100 percent social phenomenon and 3) as a 100 percent mental phenomenon.

Transferring this principle to the concepts of communication, information, and documentation is correct, in my opinion, since the boundaries between these fields ensure that the various ways of observation complement each other, but also exclude each other. If one were to focus for example on the social or material aspects of the field of information, then one would be in danger of transgressing the boundaries of other disciplines and no longer being included in one's own field.

At first glance, the parallels between the varying ways of viewing light (particles and waves) and books (material, social, and mental aspects) also appear to make sense; one can often observe that established fields of inquiry such as literary studies, for example, will overlook one or more aspects in favor of another, or even leave them aside. Various traditions within the field, or even schools or "camps" within the same field, often come to completely different conclusions while excluding other results and approaches at the same time. Dichotomies, such as qualitative and quantitative methods, induction and deduction, or subject and object are examples of such mutually exclusive points of departure. In reference to quantum theory, Bohr stated that observations never can be made simultaneously. For example, one cannot see an electron as a particle and a wave at the same time. Two different experimental situations are necessary, but they cannot be conducted at the same time, only one by one. By referring to Bohr, Lund also accepts Bohr's criteria of exclusivity and thereby overlooks the fact that Bohr limits the validity of the principle of complementarity to quantum theory:

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<sup>4</sup> Niels W. Lund: "Documentation in a Complementary Perspective". p. 96.

Within the scope of classical physics, all characteristic properties of a given object can in principle be ascertained by a single experimental arrangement, although in practice various arrangements are often convenient for the study of different aspects of the phenomena. In fact, data obtained in such a way simply supplement each other and can be combined into a consistent picture of the behavior of the object under investigation. In quantum physics, however, evidence about atomic objects obtained by different experimental arrangements exhibits a novel kind of complementary relationship.<sup>5</sup>

Therefore, I ask whether it is correct to refer to Bohr's principle of complementarity in the field of document analysis, since the varying aspects are mutually exclusive in Bohr's work. Would it not be more accurate to view complementarity as a relationship between parts that form a whole, thereby not excluding each other – parts that can never be viewed completely separately from each other? That would also mean that the various approaches would also not necessarily exclude each other and that they could be investigated either parallel to one another or nearly simultaneously, even though synchronous observation is not possible. To clarify this, we can return to Lund's example of the book. Initially, I would like to focus on material aspects.

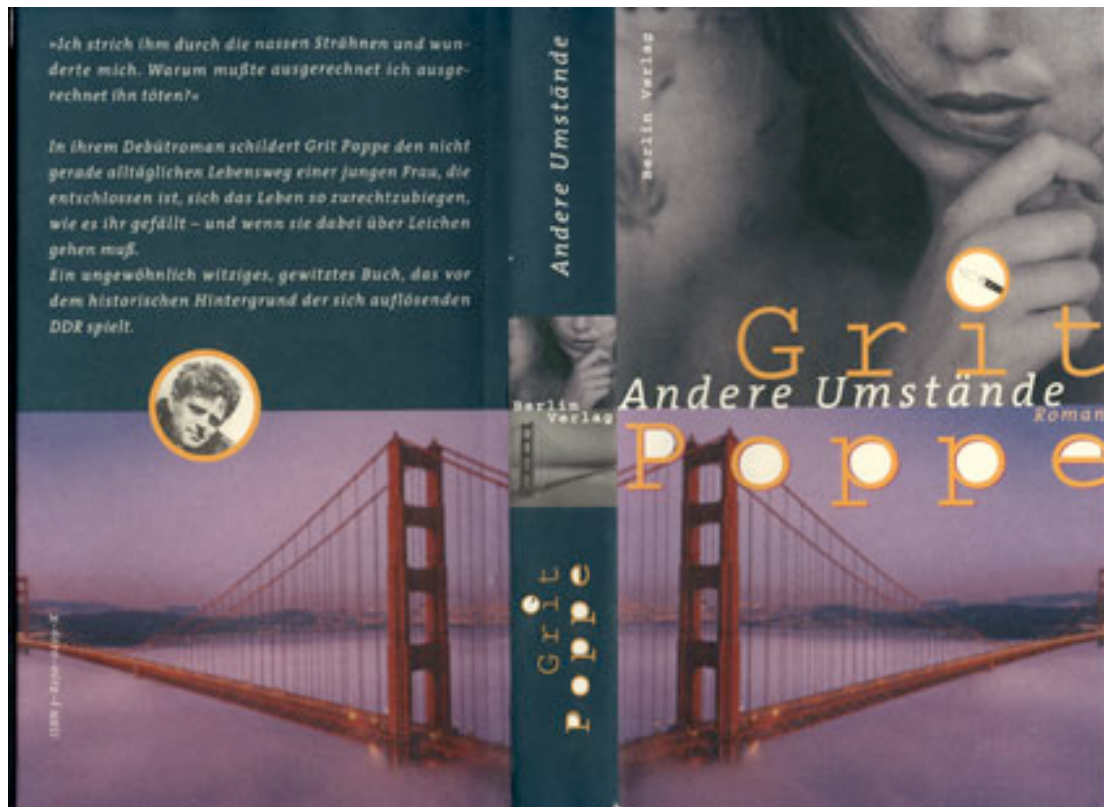
Regardless of which book we choose, whether it's a textbook or fiction, we can describe its materiality without knowing anything about its contents, that is, its mental aspects.

On the jacket and title page, we find the name of the author or authors and the title of the book, often with a caption that offers a designation of the genre. If the book is written in a language we understand, we read these designations and, dependent upon our previous knowledge, we can sort the book into a historical and social context. On the colophon page, we find further information about the quality of the paper and the typography; the publisher and the printer are mentioned by name as well as whoever is responsible for the cover design. We can determine the format of the book and describe the material used for the binding and cover. Although we rarely come across books whose format and binding are remarkably different from others, due to standardization in the modern publishing industry, we can still analyze the choice of color and motif, as well as the design of the book cover and jacket, and speculate about its content.

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<sup>5</sup> Niels Bohr: "Quantum Physics and Philosophy – Causality and Complementarity". In: *Niels Bohr. Collected Works*. Edited by Jørgen Kalckar. Volume 7: Foundations of Quantum Physics II (1933-1958). pp. 385-394, p. 391.

By way of example, let us look at the jacket of a novel published in 1998:



The first print of the novel appeared in hardcover, the format (thirteen-point-two by twenty-two centimeters, and three hundred two pages) is commensurate with that of many other modern publications and especially those novels from the same publishing house, the Berlin Verlag. The wine-colored cover corresponds with the dark green of the book jacket and the reddish and purple tones in the bottom half of the cover. The signal color orange emphasizes both the author's name and a picture of Jack London on the back cover. The title of the novel, the name of the publisher, as well as comments about the author and the contents of the book, are silhouetted in white against a darker background. The hardcover edition with book jacket and bookmark cost about twenty-three dollars at the time of publication, July 1998.

The description and analysis of the obviously material aspects cannot proceed completely detached from mental and social aspects, since all of us view a particular book with our experiences and expectations, just as we do any other document, and we make associations before and during the analysis. Only in theory can we imagine the possibility of encountering a totally unfamiliar document that does not elicit associations to other documents or connections to our earlier experiences. In this way, we can speculate about the genre as soon

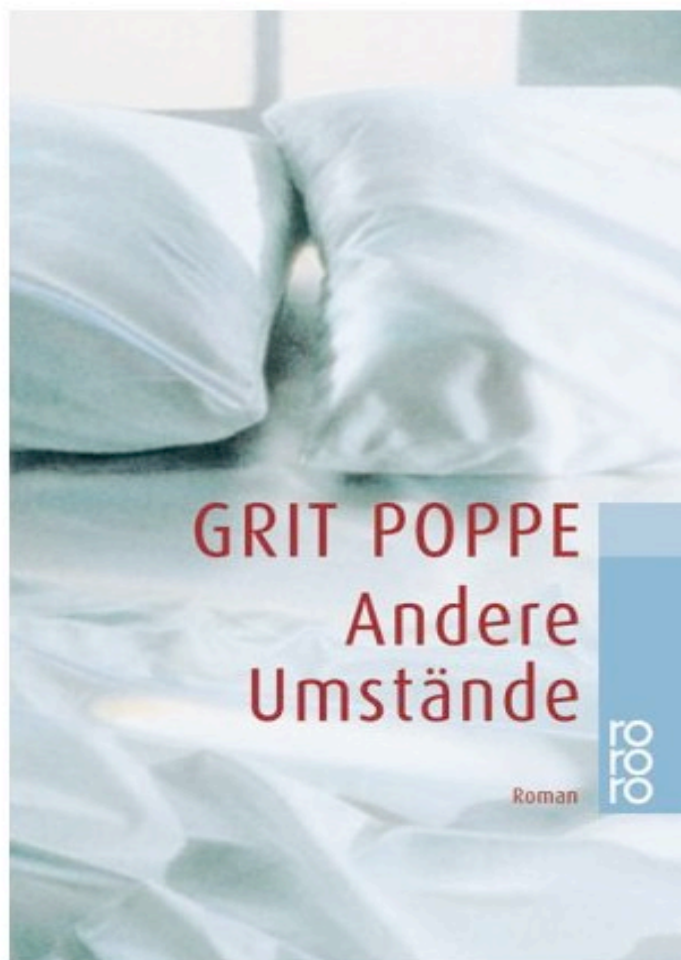
as we look at the format and scope of the book. These speculations might be confirmed by the caption “novel”. Depending upon whether or not this author is known to us and whether we’re familiar with possible earlier books by the author, we can make assumptions about the book’s content. These assumptions may either be confirmed by the title, possible captions, and information on the book jacket, or they may be steered in a different direction. The fact that we are dealing with a hardcover book raises the question „why?“, such as about the design of the book cover. The layout of the latter is usually conducted by a designer who tries to come up with a cover that fits the contents of the book and makes both a statement about the book and also incites the curiosity and the desire to purchase and read the book, which would bring us to the economic and social bases of the publication. The design usually takes place in consultation with the publisher and the author, as does the choice of title, which can be an extended process between the publisher and the author.

Both the packaging of a book as well as the representation of the author and the plot give us first indications of the book’s contents. In the case of our example, the cover page is divided vertically by the author’s name and the title of the novel, the name being in a wider font than the title. In the upper half of the cover, we see the lower part of a young woman’s face and her hand, while in the lower half we see the Golden Gate Bridge in San Francisco. In the dot of the eye of the first name, a knife can be seen, and on the back cover there is a photo of Jack London. A quote on the back cover connects the knife to a murder: “I stroke his damp locks and was amazed. Why did I, of all people, have to kill him?” In this way, the reader already gets a sense of the novel’s plot through the design of the book’s jacket, the blurb, and the motto by Jack London in the preface, which can be read as a commentary on the actual text. The images of the Golden Gate Bridge and Jack London indicate the location of the background story, the young woman on the cover of the book could be the first-person narrator, Mila, who is following the tracks of Jack London with her baby, Alice. The title, *Andere Umstände*, has at least two meanings, one being literal: different circumstances; but this is also an expression meaning pregnancy. Since the age of 13, Mila has longed for nothing more than to become a mother, and even her native country, the German Democratic Republic, has been in different circumstances since the autumn of 1989.

On the basis of the format and the layout of the book, it is also possible to make a statement on the social status of its author and accordingly the position of the book within society. If this were a novel, for example, by a well-known and widely read author, the publisher can

count on strong sales and will therefore consider a more elaborate book design. A more expensive production, using perhaps a linen binding and illustrations, must be justified by potential sales, whereas a hardcover edition has long signaled quality and reliability of a publication. Since we have learned from the blurb that the author is relatively young, we can suppose that the publisher had faith in the quality of the novel and its salability.

I hope that by way of this brief analysis, I've made it clear that a distinct separation between material, social, and mental aspects can be merely a construction. They are moreover clearly interwoven and dependent upon each other. How dependent the various aspects are upon each other will become more obvious in the case of our example when we look at another edition of the same text:



Here, too, the author's name is more prominent than the title, something that could be connected to her well-known surname (her father was active in the East German civil move-

ment of Autumn 1989). The white bed linens are indicative of purity and innocence, which stands in direct contrast to the title and not least the red color of the printing on the cover. Furthermore, this edition is a paperback that appeared in a series (Rowohlt paperbacks) and is therefore significantly cheaper than the hardcover edition, even though its design is less flexible than that of the original edition. Additionally, paperback editions usually appear a few years following hardcover editions, as was the case with this book.

I will leave it to your imagination to associate mental and social aspects with this book cover; imagine finding both books side-by-side in a bookstore or library: which one would you choose and why?

In my opinion, this dependence and connectivity of the individual aspects within and among each other also shows that the results of an analysis of the various aspects does not have to be mutually contradictory, as Bohr describes it regarding quantum theory – “Likewise we must be prepared that evidence, obtained by different, mutually exclusive experimental arrangements, may exhibit unprecedented contrast and even at first sight appear contradictory.”<sup>6</sup> – instead, they complement each other. I see the potential of conducting an analysis according to documentation research in the very possibility of having all three perspectives in view simultaneously and thereby being able to conduct the most complete analysis possible, one that takes into consideration all aspects from the point of departure and does not disregard one or another aspect as insignificant. For if we wanted to concentrate on one aspect alone, we could do this in the context of other disciplines. In doing so, not all aspects have to be equally important in each analysis, but rather it is more pertinent to be able to make clear the connection between aspects and their mutual dependence and accordingly also the effect on, for example, material aspects upon the interpretation of the content and the social role of both book and author. This does not mean that one tries to measure or specify the size or the allotment of the various aspects or to assert that one aspect is more comprehensive or important than another. Nonetheless, what we state here leads to problems in relationship to Lund’s line of reasoning:

That means that the book does not partly carry one of these three features: it is 100 percent a material phenomenon, 100 percent a social phenomenon, and 100 percent

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<sup>6</sup> Niels Bohr: "The Unity of Human Knowledge". In: *Niels Bohr. Collected Works*. Edited by Finn Aaserud. Volume 10: Complementarity beyond Physics (1928-1962). pp. 155-160, p. 158.

a mental phenomenon, making a complete asynthesis. There is no single overarching synthesis, but three ways of closing or bordering the phenomenon.<sup>7</sup>

For are we not striving for a synthesis in the sense of the most complete image possible when we conduct a documentation analysis? After all, we are not concerned with recognizing the object as something different, but rather with showing how the various aspects belong together and in relationship to one another. And do we not do this with the conviction of being able to approach the object in a more adequate manner, if not a better one? This happens not least based on the experience that for example within the various schools of literature scholarship literature is reduced to one or a few aspects; a reductionism that has led to a commensurate backlash. It's not about an either/or, but rather an "as well as" when we try to analyze and interpret the various aspects of a document.

Another question that arises in this context concerns the extent to which a complementary document analysis with an equal weighting of all aspects is actually feasible. That I focus, for example, primarily on the material aspects such as format and cover design could be a reaction to its neglect within literature scholarship. It remains a challenge, however, to be able to treat all forms of documentation with equal measure. Nonetheless, that should not prevent us from putting the accuracy of the principle of complementarity to the test in numerous and various document analyses. The word complementarity means both mutual exclusivity and completeness of description;<sup>8</sup> for a scholarly analysis of a document, in my opinion, only the second sense is adequate.

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<sup>7</sup> Niels W. Lund: "Documentation in a Complementary Perspective". p. 96f.

<sup>8</sup> See Arkady Plotnitsky: *Complementarity. Anti-Epistemology after Bohr and Derrida*. Durham and London 1994. p. 5.