‘SEHKOLLEKTIV’: SIGHT STYLES IN DIAGNOSTIC COMPUTED TOMOGRAPHY[1]

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ABSTRACT

This paper aims to trace individual as well as collective aspects of ‘sight styles’ in diagnostic computed tomography. Radiologists need to efficiently translate the visualized data from the living human body into a reliable and significant diagnosis. During this process their visual thinking and the created images are incorporated into a complex network of other visualizations, communication strategies, professional traditions, and (tacit) visual knowledge. To investigate the interplay of collective as well as individual dimensions of diagnostic seeing, the concept of ‘sight collective’ (*Sehkollektiv*) is developed. On the one hand, this concept is based on critical reading of Ludwik Fleck`s epistemological writings and his notions of thought collective (*Denkkollektiv*) and thought style (*Denkstil*). On the other hand, it is tested by means of qualitative empirical studies in a radiological university clinic (participatory observations and informal interviews). By employing this approach, the paper traces the collective foundations of a certain diagnostic sight. Moreover, it shows how the individual abilities of radiologists to perform stylized seeing rely remarkably on software-based interactions with the processed images and on tacit dimensions of visual knowledge.

COMPLEX PROCESSES: VISIBILITY IN DIAGNOSTIC COMPUTED TOMOGRAPHY

Computed tomography (CT)[2] images unfold as a complex and intersected process of technological requirements, visual knowledge, and socio-cultural inscriptions. By focusing on the question how a specific way of diagnostic seeing is established and applied, this paper explores the collective as well as the individual aspects that constitute a certain ‘sight collective’.

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2 In short, computed tomography is a medical imaging process that employs rotating X-rays to create a computer processed volume of data (tomograms). The data sets are usually displayed as grayscale visualizations of body slices that can be manipulated on the screen by software tools. For a socio-cultural history of the development of CT in the USA, see e. g., Holtzmann Kevles (1997, pp. 143–172) as well as on performing a CT scan Saunders (2008, pp. 93–129).

To develop the conceptual framework of sight collective I draw on Ludwik Fleck's ideas of thought collective and thought style, however, and extend them in a critical perspective to capture also the (tacit) individual skills that support the diagnostic sight.

This framework was inspired by (and at the same time reassessed by) participatory observations and informal interviews at a radiological department of a German university hospital.[3] There I observed the processes of image capturing by computed tomography and case-based diagnosing in an everyday work routine setting for 3 weeks. During the stay, questions as follows arose: Are the applied imaging modalities referring to a certain visual tradition? Which socially conditioned factors are constituting and influencing the diagnostic sight? And: How can tacit dimensions of visual knowledge be traced?

To grasp these issues as facets of what I would like to call sight collective (*Sehkollektiv*), I am referring to Ludwik Fleck but also to Michael Polanyi's ideas on the tacit dimensions of knowledge. By extending and altering Fleck's perspectives it is possible to expose the collective – i. e. educational, socio-cultural, and practiced – dynamics which establish the framework of individual diagnostic seeing and knowing within a community like a radiology department. Or, as a senior radiologist reported during diagnosing CT images: "We have a certain amount of optic experience. Sometimes I cannot say why something on the screen is a lesion and not an artefact, but it is – I just see it."[4]

'ELUSIVE FACTORS': EXPANDING FLECK'S EPISTEMOLOGY

"An 'empty mind' does not perceive, does not compare, does not supplement: does not think" (*Fleck 1986d [1936], p. 110*).

In order to detect the collective foundations and dynamics of CT diagnosing, I refer to the framework of Ludwik Fleck's epistemology of science and medicine. His writings offer valuable theoretical, since practice-grounded, explanations based on "an amalgam of philosophy, history, and sociology, [which] anticipated the naturalizing and historicizing tendencies of contemporary philosophy of science" (*Fagan 2009, p. 273*). The basic notions of his theory are thought collective and thought style, which are dynamic and relational visions to trace the socio-cultural and historical properties of scientific knowledge (*Fleck 1986d [1936], p. 79*). Fleck's "essentially interactive, social and developmental" (*Fagan 2009, p. 273*) epistemology is based on the observation of three fundamental phenomena.

First, the "collective mental differentiation of men" (*Fleck 1986d [1936], p. 81*) allows people to communicate and understand each other because they "think

3 For comprehensive ethnographic case studies of tomography in medical contexts, see e. g., Beaulieu (2001, 2002), Cohn (2004), and Dumit (2004) on neuroimaging; Burri (2008a), Joyce (2008), and Prasad (2005) on MRI; Barley (1984, 1986) and Saunders (2008) on CT.

4 All following quotes from radiologists of the observed radiological department are translated by the author.

By exceeding and shifting Fleck's ideas, the concept of sight collective provides a tool to grasp also the individual and tacit aspects of sight styles. Certainly, this needs further qualitative research, in particular on the design of diagnostic software and human-computer interaction in radiology. As proposed for example by Paul Dourish, also "the interaction between the designer and the user *through* the system" (*Dourish 2001, p. 56, italics in original*) could be explored. If the designer "must structure the system so that it can be understood by the user, and so that the user could be led through a sequence of actions to achieve some end result" (*Dourish 2001, p. 56*), how much does the designer have to know about the user's sight style? This leads to issues of communication of sight among collectives, and additionally points to the question whether a tacit 'sight craft' could be anticipated or stimulated within a GUI.

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