Inhaltsverzeichnis

Chapter 1. Introduction and plan of the work	3
1. Introduction: the main theses of this work	6
2. The historiography of scientific concepts	14
3. Concepts as disembodied constructs: a critique of histories of concepts as philosophical	22
case studies on realism or meaning	
4. Representations in scientific practice: from "inscriptions" to "materiality"	28
5. Experimental practices, concept formation and the distinction between the "empirical" and	38
the "abstract" sphere	
6. Conceptual practices and the materiality of theory	48
7. Conclusions: concepts and clusters of representations	50
8. Overview of the material presented in chapters 2-9	
8.1 Diagrams and the conceptualization of refraction in the work of G.B. Della Porta	50
8.2 Symbolic notations and mechanical concepts in the early modern period	53
8.3. What is a "regular structure?" Drawings, numbers, and philosophical terminology	53
in early crystallography	
8.4 The formation of angular momentum between diagrams, differential equations and	55
Foucault's pendulum	
8.5 Selection rules: the conceptualization of "missing events" as positive evidence	56
8.6 The emergence of "quantum states" from the interplay of symbolic notations and	58
verbal statements	
8.7 The formation of the concept of baryon number from the productive tension of	59
symbols, verbal analogies and mathematical structures	
8.8 Spontaneous symmetry breaking: narrative structures in theoretical physics	62

Chapter 2: Thinking with optical objects: glass spheres, lenses and refraction in Giovan Battista Della Porta's optical writings

in: Journal of Early Modern Studies 3 (2014): 38-60

Chapter 3: Mathematical notation as a philosophical instrument

in: Siegfried Zielinski und Silvia M. Wagnermaier (Hg.), *Variantology 1. On Deep Time Relations of Arts, Sciences and Technologies* (Köln: Walther König, 2005), p. 279-296

Chapter 4: Crystallogy in the making

in: Siegfried Zielinski und Eckhard Fürlüs (Hg.), Variantology 4. On Deep Time Relations of Arts, Sciences and Technologies in the Arabic-Islamic World and Beyond (Köln: Walther König, 2010), p. 53-86

Chapter 5: Angular momentum between physics and mathematics

in: Karl-Heinz Schlote und Martina Schneider (Hg.), *Mathematics Meets Physics* (Frankfurt a. M.: Verlag Harri Deutsch, 2011), p. 395-440

Chapter 6: The emergence of selection rules and their encounter with group theory: 1913-1927

Studies in the History and Philosophy of Modern Physics 40 (2009): 327-337

Chapter 7: Dirac's bra-ket notation and the notion of a quantum state

in: Hermann Hunger, Felicitals Seebacher und Gerhard Holzer (Hg.), Styles of Thinking in Science and Technology. Proceedings of the 3rd International Conference of the European Society for the History of Science (Vienna 2008) (2010), p. 361-371

Chapter 8: The making of an intrinsic property: 'symmetry heuristics' in early particle physics"

in: Studies in the History and Philosophy of Science, 50 (2015): 59-70

Chapter 9: Genesis des Gottesteilchen: Narrativen der Massenerzeugung in der Teilchenphysik

in: Safia Azzouni, Stefan Böschen, Carsten Reinhardt (Hg.), *Erzählung und Geltung. Wissenschaft zwischen Autorschaft und Autorität* (Weilerswist: Verlag Velbrück Wissenschaft, 2015), p. 63-86