Kuhn's *The Structure of Scientific Revolutions* at 60

Thomas Kuhn's *The Structure of Scientific Revolutions* has sold over a million copies since its publication in 1962, is one of the most cited academic books of all time, and continues to be read and studied today. This volume of new essays evaluates the significance of Kuhn's classic book in its changing historical context, including its initial reception and its lasting effects. The essays explore the range of ideas that Kuhn made popular with his influential philosophy of science, including paradigms, normal science, paradigm changes, scientific revolutions, and incommensurability; and they also look at less-studied themes in his work, including scientific measurement, science education, and science textbooks. Drawing on the latest scholarship as well as unpublished material in the Thomas Kuhn Archives at MIT, this volume offers a comprehensive way into Kuhn's philosophy and demonstrates the continuing relevance of his ideas for our understanding of science.

K. Brad Wray is Associate Professor at the Centre for Science Studies, Aarhus University. His recent publications include *Interpreting Kuhn: Critical Essays* (Cambridge University Press, 2021) and *Kuhn's Intellectual Path: Charting "The Structure of Scientific Revolutions"* (Cambridge University Press, 2021).

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This book is dedicated to
Pablo Melogno†
1979–2023
Friend and Scholar

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Hilary Gaskin of Cambridge University Press originally approached me with the idea of taking on the project of editing a volume of papers in celebration of Thomas Kuhn's influential book *The Structure of Scientific Revolutions* (SSR) as part of a new series intended to celebrate key books in philosophy on the anniversary of their publication. This seemed like a great idea, and a great opportunity to foster scholarship on Thomas Kuhn and SSR.

After planning the volume, I was encouraged by Paul Hoyningen-Huene to run a conference in 2022, in celebration of the sixtieth anniversary of the publication of SSR, as well as in honor of the hundredth year since Kuhn's birth. A number of happy coincidences occurred that made running such a conference feasible. First, I had the good fortune to be appointed as an Associate Fellow at the Aarhus Institute of Advanced Studies (AIAS) in 2021. AIAS is an exciting interdisciplinary research environment organized to encourage fruitful interactions between scholars across traditional disciplinary lines. Further, AIAS provided some financial support for a conference, as well as wonderful facilities in which to host the conference. I want to thank the director of AIAS, Søren Rud Keiding†, for his support, as well as the staff at AIAS. In addition, with the help of my colleague Kristian Hvidtfelt Nielsen, I applied for and was awarded a conference grant from the Carlsberg Foundation. I want to thank the director and staff at AIAS for their help in organizing and running the conference, as well as the Carlsberg Foundation for their generous support (Grant No. CF21-0698). The conference allowed me to invite a number of the contributing authors to Aarhus to present their papers, as they worked on them, as well as other Kuhn scholars. The excitement and energy at the conference was wonderful. And the constructive exchanges of ideas are reflected in a number of the pieces in the volume. I want to thank all those who participated in

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Abbreviations

Thomas Kuhn's Books

BBT (1978). *Black-Body Theory and the Quantum Discontinuity, 1894–1912*. Oxford: Oxford University Press.

CR (1957). *The Copernican Revolution: Planetary Astronomy in Development of Western Thought*. Cambridge, MA: Harvard University Press.

ET (1977). *The Essential Tension: Selected Studies in Scientific Tradition and Change*. Chicago: University of Chicago Press.

- "Preface," pp. ix–xxiii (1977a).
- "The Relations between the History and the Philosophy of Science," pp. 3–20 (1976/1977b).
- "Mathematical versus Experimental Traditions in the Development of Physical Science," pp. 31–65 (1976/1977a).
- "The History of Science," pp. 105–126 (1968/1977).
- "The Relations between History and History of Science," pp. 127–161 (1971/1977).
- "The Function of Measurement in Modern Physical Science," pp. 178–224 (1961/1977).
- "The Essential Tension: Tradition and Innovation in Scientific Research," pp. 225–239 (1959/1977).
- "Second Thoughts on Paradigms," pp. 293–319 (1974/1977).
- "Objectivity, Value Judgment, and Theory Choice," pp. 320–339 (1973/1977).

LW (2022). *The Last Writings of Thomas S. Kuhn: Incommensurability in Science*, ed. Bojana Mladenovic. Chicago: University of Chicago Press.

QPT (2021). *The Quest for Physical Theory: Problems in the Methodology of Scientific Research*, ed. George A. Reisch. Boston: MIT Libraries.

RSS (2000). *The Road since Structure: Philosophical Essays, 1970–1993, with an Autobiographical Interview*, ed. J. Conant and J. Haugeland. Chicago: University of Chicago Press.

- "The Road since *Structure*," pp. 90–104 (1991/2000).
- "The Trouble with the Historical Philosophy of Science," pp. 105–120 (1992/2000).
- "Afterwords," pp. 224–252 (1993/2000).
- "A Discussion with Thomas S. Kuhn" (with Aristides Baltas, Kostas Gavroglu, and Vasso Kindi), pp. 253–323 (1997/2000).

SSR *The Structure of Scientific Revolutions*, Chicago: University of Chicago Press.

- First edition (1962). SSR-1
- Second edition, includes "Postscript-1969" (1962/1970), pp. 174–210. SSR-2
- Third edition, includes "Postscript-1969" (1962/1996), pp. pp. 174–210. SSR-3
- Fourth edition, 50th anniversary edition, with an introductory essay by Ian Hacking (1962/2012), "Postscript-1969," pp. 173–208. SSR-4

TSK Archives–MC240

The following are documents from the Thomas Kuhn Archives at the Institute Archives and Special Collections, MIT Libraries, Cambridge, MA. They are cited according to date.

(1959). Lectures, General, 1957–1959, box 3, folder 12.

(1961b). *Proto-Structure*. Unpublished early manuscript of *The Structure of Scientific Revolutions*.

(1964). Lectures, General, 1960–1964, box 3, folder 13.

No Abbreviations Used

The following are papers of Kuhn's that do not appear in one of the above books. They are cited according to date.

(1952). "Robert Boyle and Structural Chemistry in the Seventeenth Century." *Isis* 43, 1: 12–36.

(1961a). Letter from Thomas S. Kuhn to James B. Conant. Berkeley, CA, June 29. Harvard University Archives.

(1963). "The Function of Dogma in Scientific Research." In A. C. Crombie (ed.), *Scientific Change: Historical Studies in the Intellectual, Social and Technical Conditions for Scientific Discovery and Technical Innovation, from Antiquity to the Present*, pp. 347–369. London: Heinemann; New York: Basic Books.

(1970a). "Logic of Discovery or Psychology of Research?" In I. Lakatos and A. Musgrave (eds.), *Criticism and the Growth of Knowledge*, pp. 1–23. London: Cambridge University Press.

(1970b). "Reflections on My Critics." In Imre Lakatos and Alan Musgrave (eds.), *Criticism and the Growth of Knowledge*, pp. 231–278. Cambridge: Cambridge University Press.

(1971). "Notes on Lakatos." In R. C. Buck and R. S. Cohen (eds.), *PSA 1970: In Memory of Rudolf Carnap*, pp. 137–146. Dordrecht: Reidel.

(1972). "Scientific Growth: Reflection on Ben-David's Scientific Role." *Minerva* 10: 166–178.

(1974). "Discussion." In F. Suppe (ed.), *The Structure of Scientific Theories*, pp. 500–517. Urbana: University of Illinois Press.

(1976). "Mathematical versus Experimental Traditions in the Development of Physical Science." *Journal of Interdisciplinary History* 7, 1: 1–31.

(1979). "Foreword." In Ludwik Fleck, *Genesis and Development of a Scientific Fact*, ed. T. J. Trenn and R. K. Merton, trans. F. Bradley and T. J. Trenn, pp. vii–xi. Chicago: University of Chicago Press.

(1980). "The Halt and the Blind: Philosophy and History of Science." *British Journal for the Philosophy of Science* 31: 181–192.

(1983). "Reflections on Receiving the John Desmond Bernal Award." *4S Review* 1, 4 (Winter): 26–30.

(1984). "Professionalization Recollected in Tranquility." *Isis* 75, 1: 29–32.

(1986). "The Histories of Science: Diverse Worlds for Diverse Audiences." *Academe* 72, 4: 29–33.

(1989/1993). "Foreword." In Paul Hoyningen-Huene, *Reconstructing Scientific Revolutions: Thomas S. Kuhn's Philosophy of Science*, pp. xi–xiii. Chicago: University of Chicago Press.

(2016). "The Nature of Scientific Knowledge: An Interview with Thomas Kuhn (conducted by Skúli Sigurdsson)." In A. Blum et al. (eds.), *Shifting Paradigms. Thomas S. Kuhn and the History of Science*, pp. 17–30. Berlin: Max-Planck-Institute for the History of Science.