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The Range of Science

Studies on the Interdisciplinary Legacy
of Johannes von Kries

Edited by
Gerhard Wagner

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in memoriam Guenther Roth 1931–2019

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Preface

Physiologist Johannes von Kries (1853–1928) left behind scientific work that remains fascinating in its interdisciplinary diversity.¹ He portrayed the genesis of this work himself (Kries 1925; cf. Buldt 2016; Lorenz 1996; Oser 1983) and divided the “more important” of his publications into two fields: “Physiology” and “Philosophy” (Kries 1925: 185–187).² In the field of physiology, he sketched and bibliographed studies on muscle activity, pulse waves and sensory perception (Kries 1925: 133–153, 185–186); in the field of philosophy, studies on probability theory, logic and the significance of Immanuel Kant for natural research (Kries 1925: 153–179, 187). Both his physiology and his philosophy studies were received. However, the reception in physiology was of greater sustainability.

In physiology, his studies on sensory perception were particularly influential (Kries 1923). His duplicity theory and the coefficient law named after him are still constants in research on “color vision” (Bianco 2012; Finlayson et al. 2006; Ma et al. 2016; Roeckelein 2006: 621–622; Webster et al. 2010). In fact, it is possible to publish articles on this topic that bear the name Kries in the title without referring to his publications in the text (Chong et al. 2007; Kulikowski et al. 2012; Lecca 2014; Lecca and Messelodi 2009; Moreno et al. 2011). The reception of his studies was fostered by the fact that some were already translated into English during his lifetime, others in the 1970s and 1990s (Buldt 2016: 232–235; MacAdam 1970).

In contrast, his publications on philosophy were not afforded such a sustainable reception. This has nothing to do with Kries not being a studied philosopher. As the works of renowned natural scientists such as Hermann von Helmholtz and Emil Du Bois-Reymond show, it was quite typical at the time to bring natural science and philosophy together. Alongside his fundamental interest in the relationship between “sensory physiology” and “epistemology” (Seidler 1993: 204), it was a concrete research problem that made Kries a “philosopher at the Freiburg Chair of Physiology” (Hoffmann 1957).

That in research “the *probability* of any fact was evaluated numerically” had been discredited in view of the “immeasurability of psychical conditions” proven with the failure of Weber-Fechner’s law, because the prevailing opinion understood probability “subjectively” as “strength of expectation” (Kries 1925: 156–157). A numerical designation of probability seemed possible only if “the probability values have some *objective* significance”, i. e. if “*objective* size relationships are *decisive for our expectation*” (Kries 1925: 157). For Kries, such size relationships existed paradigmatically in “*random games*” such as dice throwing or coin tossing. This led him to the “establishment of a new logical princi-

1 To make this book easier to read, the nobility title “von” is omitted.

2 A complete list of publications can be found in Buldt (2016: 227–235).

ple”, which he called the “*principle of ranges*” and made the basis for a theory of objective probability (Kries 1925: 157–158).

For Kries, random games were “ideal cases” with which other areas of reality can be understood if they “behave analogously” (Kries 1886: 82, 140). As such, he recognized the behaviour of gas molecules in a closed container (Kries 1886: 262). This was no coincidence because his “philosophical thinking” had received a “push” from “*theoretical physics*” (Kries 1925: 154). Of course, Kries also stated that in other, less analogous areas, such as the behaviour of humans, no “numerical designation” of “probability” comes into question, so that “only a very general use of the principle of ranges” is possible (Kries 1886: 239, 263–264). However, this did not prevent him from exploring the applicability of his theory in these areas as well, which also motivated him to formulate a corresponding theory of causality (Kries 1888) and finally to embed his “logical investigation” of probability in an own logic (Kries 1916).

Kries’s writings on probability theory were reviewed (Lexis 1886; Meinong 1890; Stumpf 1892) and received in basic research (Bortkiewicz 1899; Bruns 1906; Czuber 1908; Meinong 1915; Mises 1919; 1936; Reichenbach 1916; 1935; Tschuprow 1905; 1906; Waismann 1930). They were also received in specific fields of research, not only in physics (Boltzmann 1886; Planck 1901; cf. Darrigol 2001; 2003; Gearhart 2002; Kuhn 1978; Stöltzner 2003) but also in jurisprudence (Liepmann 1900; Merkel 1889; Radbruch 1902; Rümelin 1896; cf. G’Sell 2016; Koriath 1994; Lübke 1990; Neumann 2002), in sociology (Weber 1906; 1922; cf. Eberle 1999; Heidelberger 2015; Massimilla 2012; Neumann 2002; Nollmann 2006; Ringer 1997; 2002; Treiber 2015; Turner and Factor 1981; Wagner and Zipprian 1986), in economics (Keynes 1921; cf. Fioretti 1998; Muchlinski 1996) and in philosophy (Schlick 1916; 1918; Wittgenstein 1922; cf. Goeres 2000; Heidelberger 2001; Lübke 1993; McGuinness 2002; Pulte 2016; Seck 2008). However, this reception was not particularly lasting.

There may have been two main reasons for this. First, the relativization of the deterministic worldview of the 19th century, in the context of which Kries had formulated his theory (Kries 1888: 180), certainly reduced its connectivity. Second, his writings were difficult to access. The monograph *Die Principien der Wahrscheinlichkeits-Rechnung* (*The Principles of Probability Calculation*) published in 1886 was reprinted only once (1927) and “Ueber den Begriff der objectiven Möglichkeit und einige Anwendungen desselben” (“On the Concept of Objective Possibility and Some of Its Applications”), his essay of 1888, appeared in a journal that was discontinued in 1916. Neither text was translated into English, which undoubtedly affected their reception in view of the marginalization of German as a scientific language in the 20th century. Only recently has Kries’s theory of probability been discussed again (Beisbart 2016; Fioretti 2001; 2003; Heidelberger 2001; Kamlah 1983; 1987; 1989; Michell 2011; Neumann 2002; 2007; Rosenthal 2010; 2012; 2016; Roberts 2016; Shafer and Vovk 2006; Strevens 2011; Zabell 2016).

The continuing topicality of Kries’s studies on physiology and the reawakened interest in his studies on philosophy substantiate the significance of this scholar. His work and its reception are the subject of this anthology, which does not cover all facets but at least documents the spectrum from the sciences and humanities to fine literature.

As far as physiology is concerned, Kries's studies on pulse waves (Kries 1892) are considered here by Arris S. Tijsseling and Andrew Anderson ("The Human Pulse: Fundamental Theory and Laboratory Experiment") in recognition of the continuing presence of his studies on sensory perception in current research. The other chapters are devoted to Kries's studies on philosophy and their applications in specific research fields. Berndt Buldt contributes an article on basic research in probability theory ("Without Measure: Johannes von Kries' Legacy in the Field of Probability Theory"). Guido Fioretti recognizes in Kries a forerunner of the connectionist revolution in cognitive science ("Johannes von Kries on Cognition"). Hubert Treiber discusses Kries's influence in jurisprudence ("Johannes von Kries and Gustav Radbruch: An Example of the Application of the Theory of Adequate Causation to Problems of Criminal Law"). Martin Neumann reconstructs the reception of Kries's work in social statistics ("The Ontological Science of Collective Terms: Johannes von Kries in Social Statistics"). Thomas S. Eberle examines his influence in sociology ("The Concept of Adequacy in Sociology: Johannes von Kries, Max Weber and Alfred Schutz"). Gerhard Wagner uses the example of Max Weber to show that Kries's theory was not always received with the necessary diligence ("Chance and Probability"). Finally, Andrea Albrecht and Franziska Bomski use the example of Robert Musil to show that Kries's theory also found its way into fine literature ("Equally Possible Cases: Robert Musil and Johannes von Kries").

It should also be mentioned that there are other lines of reception that have not yet been explored. Kries's concept of objective possibility found its way into the Marxist social utopias of Georg Lukács (Lukács 1923; cf. Fetscher 1973; Weyembergh 1973) and Ernst Bloch (1954–59) via Max Weber, while for Max Horkheimer, the founder of Critical Theory, Kries's theory of causality expressed "the existence of theory in the traditional sense" (Horkheimer 1937: 168). Finally, the reception of the concept of objective possibility in history should not be forgotten (Demandt 1984).

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