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Mathematics, modernity, ideology. A critical study on the legitimacy and practice of modern mathematics. (Mathematik, Moderne, Ideologie. Eine kritische Studie zur Legitimität und Praxis der modernen Mathematik.)

Konstanz: UVK-Verlagsgesellschaft; Braunschweig: Techn. Univ. Braunschweig (Dissertation 2007) (ISBN 978-3-86764-075-6). 314 p. EUR 29.00 (2008).

Preliminary review / Publisher's description: Mathematik gilt gemeinhin als Quelle eines rationalen, wertfreien und universell gültigen Wissens. Zugleich aber wird Mathematik tagtäglich in ihrer Anwendung in Wirtschaft, Wissenschaft und Politik und in ihrer Vermittlung in der Schule erlebt. Die vorliegende Arbeit verfolgt diese Dialektik von Theorie und Praxis in ihrer historischen Entwicklung; der raum-zeitliche Schwerpunkt liegt dabei auf Deutschland während der Jahrzehnte um 1900 und der Zeit des Nationalsozialismus. Gestützt auf eine umfangreiche Literatur, eigene Archivstudien sowie eine detaillierte Analyse von Schulbüchern verdichtet sich das Bild von Mathematik als einer Ideologie der Moderne. Durch die Totalisierung der Zahl wird eine Art von Machtverhältnis legitimiert, das die Individuen für die Anforderungen der modernen Gesellschaft zurichtet und damit unser Welt- und Selbstverständnis bis in die Gegenwart formiert.

This book is an Ideologiekritik ("critique of ideology") of the Mythos Mathematik, "myth mathematics", and as such straightly in the tradition of the Enlightenment and the French idéologues, as reflected in the mirrors of Marxist and related philosophies – also in its hope that critique may return (?) to mathematics its emancipatory potentialities. This "myth mathematics" is explained (p. 11) as the conviction that "mathematics, that is, mathematical knowledge, is certain, true, rational, objective and universally valid. As carrier of this singular knowledge, mathematics, being a value-free and therefore free [freiheitlich] science, may legitimately claim universal truth, validity and competence". As made explicit on p. 100, the emphasis is on the second period, the first one being considered uninteresting – "I consider it as completely deprived of practical importance whether a mathematical statement [exemplified afterwards with the ever-recurrent $2+2=4$] in some precise logical sense is true"; elsewhere, admittedly, matters are less clear p. 140, n. 54, the result of a simple calculation is dismissed (jestingly?) because accepting it would mean "to mount the myth mathematics". Throughout, the discussion is restricted to Germany. C. 70 pages are dedicated to general discussions of "ideology", "modernity" (Die Moderne) and "modernity and Third Reich". This discussion is mostly of scholastic character, referring heavily to what is said by Hegel, Marx, Lukács, Horkheimer, Adorno, Althusser, Foucault – but never really going in depth (choosing explicitly on p. 33 to allow conceptual unschärfe – "blurredness"), nor taking up how these Fathers contradict each other. The central adjectives from the definition of the "myth mathematics" – "rational", "objective", "value-free" – are never clarified, for which reason the critique tends to mix up things just as much as the myth itself. The admission (p. 75) that even those of the authorities who at all mention mathematics or calculation have a diffuse understanding of the matter is countered by the argument that Adorno and Horkheimer (who obviously never bothered to read d'Alembert's introduction to the Encyclopédie, nor any other relevant source) insist that the Enlightenment identified thought and mathematics. After this long-winded introduction (maybe requested in a doctoral work) follows the real subject-matter: – "mathematics", in particular Hilbertian "modern mathematics", understood as "the practice of mathematicians"; – "the practice of mathematics" (in aviation aerodynamics until the 1930s, mathematical statistics until 1945, and statistics, also until 1945); – and finally school mathematics and mathematical school books. "Mathematics" discusses sociology of knowledge and its applicability to mathematics, the opinions of philosophers of mathematics, and finally of mathematicians on the matter. This last topic, however, is covered by a mere 23 lines quoted from von Neumann, 17 from Dieudonné, and 3 from Hilbert, in somewhat twisted readings. The main source is *Herbert Mehrtens*' Moderne – Sprache – Mathematik (1990; Zbl 0978.00009), but what is borrowed are aphoristic conclusions, not the arguments that lead to them and give them their meaning. The brief presentation of aviation research is more hands-on – but, as admitted on p. 130, does not touch at the role of mathematics. Much more substantial is the discussion of mathematical statistics, which includes detailed statistics (with further discussion) of publications in German language making use of statistical theory in the fields of "insurance, population and economy", "biology, heredity and [physical] anthropology", and "psychology, medicine & pharmacy and industry" in five-year periods from 1900 to 1939. "Statistics", also historically informed, deals with the use of statistics in various domains of social and political life and the qualitative leap in the application of statistics during the Third Reich. School mathematics is the topic where Ullmann becomes really informative, irrespective of whether the reader finds the philosophical framework compelling or not. A general social, institutional and intellectual history (the latter covering discussions of orientation,

methods and aims) of (German) school mathematics from c. 1800 through the Third Reich is followed by a chapter on "mathematics school books" in general and finally by an insightful analysis of the development of a particular school book through various versions from 1901 to 1951. *Jens Høyrup (Roskilde)*

Classification: E20 A40 A30
Keywords: ideology; modernity; schoolbook analyses; Third Reich; history of mathematics; philosophy; philosophy of mathematics; history of science