Massimo Mazzotti, *Reactionary Mathematics: A Genealogy of Purity*

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How did mathematics come to be seen as a value-neutral yet essential feature of modern political life? Massimo Mazzotti's *Reactionary Mathematics: A Genealogy of Purity* traces the emergence of the 'distinctly modernist perception that mathematical knowledge – and the technologies it legitimates – are neutral tools that can be used unthinkingly in the manipulation of both natural and social realities' (p. 2). Mazzotti uses close historical analysis of a mathematical controversy to investigate purity as an epistemic virtue in mathematics in an episode of resistance to modern (that is, French) mathematics and governance in the Kingdom of Naples around 1800. At stake in the controversy, Mazzotti argues, was more than just different mathematical problem-solving methods that divided two mathematical cultures but competing (and incompatible) images of mathematics, politics, history, modernity and reason. *Reactionary Mathematics* contributes to the ongoing project to radically historize mathematics, particularly the rise of rigorous analysis. Mazzotti also contributes to Neapolitan historiography by making explicit the dynamic intimacy of mathematics and politics in this period. Rejecting the traditional separation between mathematics and culture, Mazzotti goes further still; in *Reactionary Mathematics*, mathematics *is* social order, and the 'politics of mathematical modernity' (p. 238) that Mazzotti explores are anything but neutral.

Reactionary Mathematics is organized as 'a scaling exercise articulated in two movements' (p. 11). The first movement (Chapters 1–4) zooms in on the local Neapolitan context until we arrive at the heart of the controversy in the 'Intermezzo' chapter separating the movements. Chapter 1 focuses on the development of 'analytic reason' through the reconstruction of Enlightenment ideas about analysis and sentimentalism and their reception in the Neapolitan Enlightenment. In Naples, philosophical and reformist discourses mixed in planning the country's future, and analysis became a critical and soon extractive tool. Chapter 2 traces how analysis in the hands of Neapolitan Jacobins became revolutionary, as politics and mathematics enmeshed in their attempts to revolutionize Neapolitan culture and society, culminating in the short-lived Neapolitan Republic. Mazzotti argues that 'Jacobin science' was not a contradiction in terms but rather an essential part of their project in which analysis was a tool of mathematical and political liberation. Counterrevolutionary and anti-French sentiments ended the republic, the lives of many of the mathematician–reformers involved and the local mathematical culture of analysis. Chapter 3 details how analysis became a tool for control rather than liberation after the French (and analysis) returned to Naples in the Napoleonic age and Restoration. In this new analytic era, proponents insisted upon a clear distinction between analytic formalism and the Jacobin political agenda. Chapter 4 explores how the physical and human landscape was represented and transformed by civil engineers and, ultimately, how their image of algorithmic rationality struggled in a 'sociotechnical controversy over modernization' (p. 2) to overcome the resistance of local elites, local knowledge and reactionaries for whom Naples remained a romantic, rustic ideal free from encroaching modernization and liberalism.

The technical debate is confined to the Intermezzo. Mazzotti presents the dichotomy between the analytic and synthetic schools that divided Neapolitan mathematics along

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methodological and political lines. He explores the different 'resources, priorities, and pedagogical styles' (p. 14) of the two schools and ultimately shows that the synthetic school's call to return to Greek-style geometry and resistance to the recent mathematical (and political) developments of analysis was not dismissively backward, but part of a historically specific project that was reactionary in its politics *and* mathematics.

The second movement (Chapters 5–8) zooms out and is synthetic in its subject and style. Chapter 5 details the 'geometry of reaction' (p. 147) of the synthetic school based on the mathematical, pedagogical and historical work of Nicholas Fergola and his students. These mathematicians articulated what Mazzotti calls the modern anxiety about the purity of mathematical knowledge. Chapter 6 turns to explain how this was part of the broader epistemic culture of 'reactionary science' based on 'apologetic empiricism', which grounded human reason and scientific practice in authority and ultimately in subordination – political, religious and epistemic. Chapter 7 focuses on how this phenomenon fits in the culture of reactionary Catholicism in Naples's Counter-Enlightenment and explores how the drive to reinstate the principle of authority meant rejecting analysis and its 'celebration of the rational, independent subject' (p. 199). Instead, they put forward a different image of reason that was 'collective, a posteriori, contingent, and eminently suited to historical thinking – a reactionary reason' (p. 16). Chapter 8 offers a conclusion and ties the book's many threads into the historiography of mathematics. Here Mazzotti traces the emergence of pure mathematics from the reactionary project of Neapolitan mathematics and brings his genealogy of *purity* together with the rise of *rigour* that came to dominate modern mathematics.

Reactionary Mathematics is an ambitious book that is more than just a history of mathematics but an episode in the history of reason, furnished with a delightful display of different kinds of evidence, from archival documents to political satires to theological treatises to paintings to mathematics textbooks. With only 242 pages for such a topic and an embarrassment of historical riches, there are inevitably omissions and skimmed surfaces. The relatively short discussion of the concept and historiography of reaction (p. 201–3) tantalizes readers for further commentary into what was historically specific about this reaction, the broader relationship between reaction and science or the not-so-modern desire for order that motivates mathematics and politics. The ideas of modernity/modernism/modernization/anti-modernity saturate this book, but Mazzotti uses these terms in a historiographically specific sense, and sceptics might wish for a more nuanced discussion of such a fraught category. It should also be mentioned that Mazzotti introduces his case study of Naples as being 'from a marginal point of view' (p. 2 and differently put throughout). While Mazzotti explains its context of use (pp. 243–4 n. 6), this designation might raise some eyebrows in light of post-colonial critiques. Profitably put, this raises further questions about who is and is not allowed or able to resist modernity.

Reactionary Mathematics is a deftly written and timely book brimming with empirical, conceptual and historiographical insights. Beyond audiences of historians of Italy and mathematics, historians of Enlightenment science, of the long eighteenth century and of the relationship between politics/religion and science will find poignant juxtapositions in Mazzotti's Neapolitan case. Scholars engaging more deeply with science studies methods (especially those studying moral oeconomies of science, controversy studies and styles of reasoning) will find it an interesting exemplum with which to think. *Reactionary Mathematics* demonstrates the power of bringing science studies, cultural history and the history of mathematics together in an engaging narrative and will surely be generative for future studies in the field.

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