

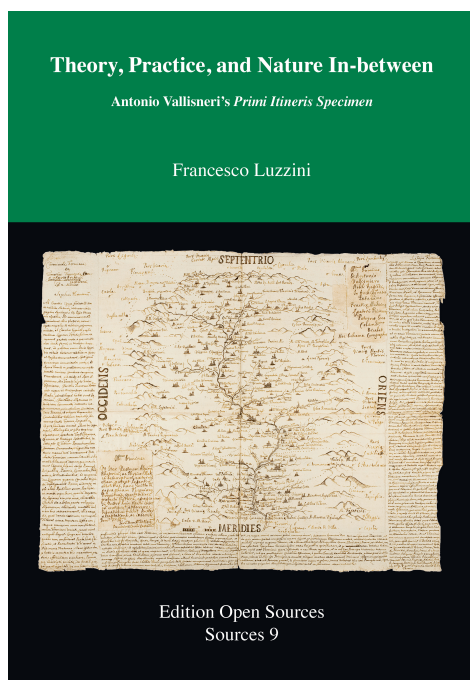
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Francesco Luzzini:

Foreword

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Theory, Practice, and Nature In-between
Antonio Vallisneri's *Primi Itineris Specimen*

Edition Open Access

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Theory, Practice, and Nature In-between
Antonio Vallisneri's *Primi Itineris Specimen*

Francesco Luzzini

Edition Open Sources

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In memory of Jackson R. Pope, III (1987–2016)
a passionate scholar
and a damn good friend

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Foreword

Antonio Vallisneri's self-deprecating portrayal of himself as a serious and austere wandering doctor belies the charm of this narrative of a mountain journey. Vallisneri's account is at once literary, scientific, and humane. Francesco Luzzini's scholarship is suffused with a similar wit and unpretentious charm. During the two-year post-doctoral fellowship in which Dr. Luzzini devoted his energies to this project, we were charmed by his own serious and austere wanderings, not only between Oklahoma and Berlin, but also among the lofty intellectual trails by which he found his way through the high mountains of the multidisciplinary history of science. All of us are grateful for the lively thought, resourceful determination, and humane charm he brought to the community of scholars that is the history of science program at the University of Oklahoma. The warmth of his friendship we experienced during those two years makes his presence here severely missed. Yet we may now turn to this publication, in which Luzzini carries us along with him across those high mountain trails of thought that connect the Republic of Letters with virtually all of the field sciences.

In this publication, Luzzini places the history of the geosciences in the center of an interdisciplinary conversation. Vallisneri's travel observations encompass "the whole range of natural science," as Luzzini explains, "in a time when the borders among different disciplines were still easily and enthusiastically crossed." Vallisneri cites leading philosophical figures of the time, whether contemporaries (e.g., Scheuchzer, Marsili), historical writers (e.g., Pliny, Gessner) or even poets (e.g., Virgil, Lucretius), who are all woven into the fabric of the narrative. Moreover, Vallisneri's report exemplifies the practices that tied dispersed members of the Republic of Letters together through the exchange of letters, gifts of specimens, and offers of hospitality for others embarked on their own travel journeys. For these and other reasons, the generous publication of this work in Edition Open Sources will uniquely benefit diverse readers with varied interests representing multiple subject areas spanning the natural sciences and humanities.

Vallisneri's First Report of a Mountain Journey is of prime interest for the interdisciplinary development of methodologies in field research. Luzzini recognizes field research as "the very root of Vallisneri's work in the Earth Sciences." In this regard, the notion of experiment is crucial. As Luzzini explains: "just as his teacher Marcello Malpighi (1628–1694) and Francesco Redi (1626–1697) had extended the influence of Galilean experimentalism from physics to medicine and biology, so Vallisneri applied the experimental method to the Earth sciences, understanding mountains, seas, rivers, plains, caverns, and springs as giant laboratories where (more or less) controlled tests and observations could be performed." Vallisneri's account of his mountain journey is a key text for anyone wishing to tease out the ways experimental methodologies were extended to field research.

Geography and travel provided ancient models for the development of empirical approaches to field research. Geography was a part of natural history, and so Vallisneri cited Pliny's *Natural History* as well as the geographies of Ptolemy, Strabo, and others, especially when describing the region of Garfagnana.

One of the most frequent types of publications in the Earth sciences in the eighteenth century was the chemical analysis of spring water. Such analyses, performed on the spot or in laboratories, provide a clear case of the application of experimental methodologies

to questions in the Earth sciences, and unsurprisingly are frequently invoked by Vallisneri. No two hot springs were the same; thus, laboratory experiments could be linked with observations that were specific to particular places in the field. Another instance consists of Vallisneri's experiments designed to simulate the passage of seawater through various materials in order to test the ability of those earthy materials to filter out sea salt. Vallisneri concluded: "the way by which sea water is filtered, and becomes fresh, is doubtful and deceptive, according to our experiments. For it cannot lose its salt by percolating through any sand, or marble, nor through any vase which has been tempered with the fire of a furnace." Whether laboratory conditions might legitimately simulate conditions of the larger Earth remained a topic of vigorous discussion long after Vallisneri, with the plausibility of such experiments resting in part upon the perceived correlation of general results to particular field locations.

The practice of medicine also provided models for conjoining the general and the specific, including research laboratories with new techniques utilizing microscopes and other instruments, anatomical theaters designed to make hidden structures visible to gathered witnesses, or therapeutic trials featuring comparisons of various outcomes under specific conditions. Numerous publications in the seventeenth and eighteenth centuries likened field investigations of the Earth to the methodologies of dissection. Medical references unsurprisingly abound in Vallisneri's report. Speaking of the sulphureous caverns of Scandiano, Vallisneri recounted: "I have been the first to send those afflicted with the filthiest French scabies into that sulphurous laboratory, as if it was a panacea." Or, he explained, "the amazing properties of the waters of Bagno della Pieve were tested against rheumatic and arthritic pains, and against various diseases of the nerves; and others who witnessed those favorable experiments, [...]." As in these examples, so in many similar comments, Vallisneri extended the language of experiment into the field.

Field research depends upon observations specific to the place. In a similar way, medical therapy depended upon the specific characteristics of particular places. Vallisneri observed, for instance, that "the sulphur of Scandiano" was more effective in its healing properties than other locations. Similarly, thermal springs varied greatly from one place to another, from the springs of Vitriola that dyed cloth black and made it more durable, to the Turrite baths which juxtaposed hot and cold springs so closely together that the temperature of the bath could easily be regulated. To extend the language of experiment to field and travel, Vallisneri compared various sites and their changes over time, as in a therapeutic trial. For example, he reported Robert Boyle's observations of a mine affected by exposure to air and not to sea. This provided, he noted, a "simple experiment" of the operation of the air and the sea in comparison with observations of diverse sites in Italy.

Vallisneri repeatedly affirmed the legitimacy of beginning with particular considerations in order to develop theories of general significance. Speaking of the relevance of his mountain journey for the meteoric theory of the water cycle, he wrote: "from a small journey, and from trivial observations, I shall ponder such immense issues." He conjoined evidence from sources as varied as his filtering experiments and the disposition and temporal behavior of specific springs and wells to construct a coordinated argument that "the mentioned wells receive their waters from the land, and not from the sea." Yet the particular character of the argument raised the need for collective investigation and community witness. The examination of other particular places would be necessary to confirm a general theory. Collective investigation would be spurred by forthright sharing of information and friendly debate among members of the Republic of Letters. Vallisneri described Ramazzini's description of the fountains of Modena as conducted "so learnedly and ingeniously, though supporting a different theory." Or, elsewhere, he wrote: "I con-

fess my ignorance on everything, but especially on these matters. Also, I beg you to let me know your opinion on the fresh water spring that, to the wonder of people, spilled out in Venice during the excavation of the Cannaregio [...].” Vallisneri’s mountain journey suggested an “experiment that it can barely conceive”; as he was an eyewitness to a small area, truth would come from multiple eyewitnesses collectively examining larger areas, especially the valleys of the Danube, Rhine, and Rhône rivers. In a development that would surely please Vallisneri, Luzzini himself has joined the cloud of witnesses: “By the summer of 2010, I was even able to perform an in-person replication of the journey and of many observations and explorations reported in the manuscript.” So also many other historians of the Earth Sciences are now incorporating the evidence of replicated field excursions alongside their analysis of texts.

Luzzini explains, “since nature could not enter laboratories, these had to be brought to (and into) nature” so that “the very notion of ‘experimentalism’ needed to be reconsidered and reshaped.” In presenting to us “Vallisneri’s creative synthesis of experimental and empirical methods,” Luzzini has shown us how Vallisneri faced his greatest challenge in the “attempt to define a methodology of field research.”

The Edition Open Sources series was conceived for just such a project as this: the publication of a primary source with widespread appeal across many disciplinary boundaries, in a manner that fuses universal access on the open Internet with academic quality as a peer-reviewed publication. I am grateful to Francesco Luzzini for his embrace of the ideals of this series and for devoting himself wholeheartedly to bringing it to full realization in this project.

Kerry V. Magruder