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Leonard Horner and an enthusiasm for Loess [Leicester Studies in the History of Loess Research part I]

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ABSTRACT

Leonard Horner (1785–1864) made substantial contributions to the study of loess. He made field trips with J.J. Noeggerath and Charles Lyell and published useful material on the loess near Bonn. He was an unappreciated pioneer- he was the first person to direct attention to loess as a material. He pointed out that loess was intrinsically interesting. He studied the material transported by the Rhine, and the alluvial deposits in Egypt, looking for links to loess, and the problem of loess formation. He was born in Edinburgh in 1785 and directed the thoughts of young Charles Darwin towards science when he came to Edinburgh to study medicine. Circumstances placed him in Bonn in the critical years 1831–1833; in this time Charles Lyell married his eldest daughter Mary; and both Lyell and Horner encountered the loess. Lyell made it well known via vol.3 of the Principles of Geology, Horner became a loess enthusiast. In the summer of 1833 Horner & Lyell were in the crater of the Roderberg considering the more than 20 m of loess deposited there. His major paper was published in 1836 (reporting the Roderberg excursion) and he joined Lyell's list of loess investigators in the 5th edition of the Principles published in 1837. He was the last to join that select eleven: Bronn, Leonhard, Boue, Voltz, Steininger, Merian, Rozet, Hibbert, Noeggerath, von Meyer, Horner. Most of these were writing on the geology and landscapes of the Rhine valley, but Horner was drawing attention to the amazing nature of the loess itself, in particular the spectacular disaggregation on contact with water. He also published the first geological map of the Bonn region, including the Roderberg and the Siebengebirge, a region of loess and volcanoes.

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“For particulars concerning the loess of the Rhine, consult the works of MM. Bronn, Leonhard, Boue, Voltz, Noeggerath, Steininger, Merian, Rozet, Von Meyer, Hibbert and Horner.”

[Charles Lyell, Principles of Geology 5th edition 1837]

“Mr. Leonard Horner also took me once to a meeting of the Royal Society of Edinburgh, where I saw Sir Walter Scott in the chair as President.”

[Charles Darwin, Autobiography 1867]

1. Introduction

In 1830 Horner was Warden of the new University of London, but he was having problems with recalcitrant professors and in

1831 had to resign because the stress was causing health problems. He moved to Bonn to recuperate and to consider his future. The family was not immediately short of money; his father had died in 1828 and they could live comfortably on his inheritance. So the years in Bonn (1831–1833) could be spent on pursuing his interests in geology.

In 1832, in Bonn, his oldest daughter Mary married the promising young geologist Charles Lyell. Lyell had already published volumes 1 and 2 of the Principles of Geology, and was working on vol.3. Charles and Mary went south into the Rhine valley for their honeymoon, and in Heidelberg Lyell met K.C. von Leonhard and H. G. Bronn and the story of loess began. Von Leonhard (1824) placed loess in the scientific literature and Bronn (1830) gave the first moderately detailed description, but Lyell put loess into vol. 3 of the Principles and the widespread distribution of his great book meant that loess became known around the world. Horner became aware of loess at about the same time as Lyell, and he, it would appear, found it even more fascinating than his famous son-in-law.

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2. Horner biography

Leonard Horner (1785–1864, [Fig. 1](#)) was born in an elegant house in George Square, in Edinburgh. The family knew James Hutton so there was an early exposure to geological influences. He went to Edinburgh University in August 1799. In 1802 he started to study chemistry with Thomas Hope. There were some lectures on mineralogy. Horner read John Playfair's book 'Illustrations of the Huttonian Theory of the Earth', and he made his first geological excursions on Arthur's Seat.

The Horners moved to London in 1804 and this enabled the geological studies to flourish. Leonard joined the Geological Society of London in 1808, the year after its foundation, and he became a secretary in 1814, and eventually its President in 1846 and 1860. He was elected to the Royal Society of London, and the Royal Society of Edinburgh in 1813. Geology was a lifelong interest but superimposed on this interest was the twenty-six years he spent as an inspector of factories and social reformer (see [O'Farrell, 2010](#) for much fuller biographical details).

His interest in loess must have started during his time in Bonn. He met and befriended the geological community there and seems to have developed quite a close relationship with Professor J.J. Noeggerath (1788–1877, [Fig. 2](#)) who was professor of geology at the University of Bonn, and a great authority on the geology of the Bonn region (see [Noeggerath, 1828](#)). Noeggerath and Horner made field excursions together and we speculate that it was on these field trips that Horner saw and became interested in the loess, which was, at that time, hardly in the front rank of study and investigation. In fact the loess landscape was an adjunct to the volcanic landscape; there was a great deal of geological interest in the Bonn region because of the presence of various Tertiary volcanoes.

Horner arrived in Bonn in 1831 and would not have had much time for geologizing before Charles Lyell turned up in July 1832 to marry daughter Mary (see [Smalley et al., 2010](#)). 1832 was such a critical loess year; on 24 July Horner wrote to Mary:

"How very extraordinary that loess is? It has not been half attended to. I saw it today in great abundance."

[see [Lyell, 1890](#), p. 271]



Fig. 1. Leonard Horner (1785–1864); crayon drawing by Samuel Lawrence.



Fig. 2. Johan Jacob Noeggerath (1788–1877); professor of geology at the University of Bonn in the critical Horner time: 1831–1833.

3. Loess

The brisk definition of loess (after [Pye, 1987](#), p. 199) is 'a terrestrial windblown silt deposit.' This is the material first described and defined in an adequate manner by Karl Caesar [von Leonhard \(1824\)](#), and first studied and investigated in the Rhine valley in the first half of the nineteenth century ([Jovanovic et al., 2013](#)). There have been surges of interest in the loess and periodic bursts of publication.

For the nineteenth century the loess problem concerned the nature of the deposition process. From about the middle of the twentieth century it was realised that the thick loess deposits contained a good record of Quaternary events; stratigraphical and palaeoclimatological investigations increased- and the advances in Quaternary stratigraphy made via loess investigation were considerable (see for example [Markovich et al., 2015, 2016](#)). In the twenty-first century it has proved possible to investigate individual loess particles and produce detailed information about particle origins and histories ([Stephens et al., 2010](#)). To some extent these recent studies bring the field of loess investigation back to a position adopted by Horner- an interest in loess for its own sake, an interesting geological material is investigated (for data on loess literature see [Smalley, 1975, 1980; Smalley et al., 2013](#)).

4. Geology of the Bonn region: Horner (1836)

On 13 March 1833 Horner delivered his paper on the geology of Bonn and region to the Geological Society of London ([Horner, 1833, 1834a](#)). At the time there was a considerable hiatus in the publication of the Transactions of the Society so the full text of the paper was not published until 1836. It was this delay in publication that caused the related loess paper by Lyell and the Rhine material paper by Horner to be published in Edinburgh ([Lyell, 1834; Horner, 1834b](#)). The delay was fortunate for Horner because it

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