

# 200 Years of Soot and Sweat

The History and Archeology of Vermont's  
Iron, Charcoal, and Lime Industries

Victor R. Rolando



Vermont Archaeological Society



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**Front cover and title page: Green Mountain Iron Company furnace ruin at Forest Dale in 1991.  
(Front cover photo by Matthew A. Kierstead)**

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## ERRATA

Page vii, column 1, bottom line, change "Art Phenning" to "Art Pfenning"  
 -----, column 2, line 12, after "Robert Neville," add "Grace E. Overly,"  
 -----, line 25, after "Allen Hitchcock" add "Mrs. Ellen (Richard) Holland"  
 -----, line 31, delete "Mrs. Mulholland (Cavendish)"  
 Page 27, column 1, line 33-34, change "Bennington, East Dorset, and West Haven." to "Bennington, Troy, and West Haven."  
 Page 87, column 1, line 8, change "November 8, 1973" to "November 8, 1793"  
 -----, line 9, change "(Wilbur vol. 2 1928:28)" to "(Wilbur vol 2. 1928:53)"  
 -----, line 18, change "of Chittenden." to "of Chittenden County."  
 Page 105, column 1, line 15, change "(Smith 1886:560)" to "(Smith 1886:500)"  
 Page 121, column 2, line 9, change "team" to "steam"  
 Page 123, column 2, line 17, change "five dogs, heavy iron rods, flat irons," to "firedogs (andirons), flatirons,"  
 Page 125, figure 4-44 caption, change "1991" to "1990"  
 Page 149, column 1, line 34, after "from softwood" add "(Egleston May 1879:377)"

Page 158, column 1, line 15, after "of other shapes" add "(Egleston May 1879:389)"  
 -----, column 2, line 31, after "Statistics of some typical conical kilns" add "(Egleston May 1879:396)"  
 Page 167, column 1, lines 4-5, delete "(in early times there was often little difference between the two)"  
 -----, column 2, line 39, change "dating prehistoric" to "dating at prehistoric"  
 Page 188, column 2, line 6, change "three ruins west" to "three ruins east"  
 Page 213, column 2, line 1, change "1840:369)" to "1840:364)"  
 Page 234, column 1, line 44, change "dioxide" to "oxide"  
 Page 245, column 1, line 11, change "1984:148, 231)" to "1984:148, 221)"  
 Page 260, figure 8-35 caption, change "(courtesy Edith Hunter)" to "(Hunter 1984:6)"  
 Page 277, column 2, line 3, change "by impulse" to "by reaction"  
 Page 278, column 2, change entry "Boltum, R." to "Bottum, Roswell"  
 Page 280, column 2, at entry for "Hunter, Edith F." change "vol. 55, no. 8." to "vol. 55, no. 8, Special Supplement."  
 NOTE: pages 284-296 (Index) is completely revised.

## Foreword

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In 1978, Vic Rolando made me an offer that I couldn't refuse. In exchange for my enthusiasm and moral support, he would begin to inventory the ruins and other surviving remains of Vermont's iron industry. He hugely underestimated his task.

The more research he did, the more complex the puzzle became. After a few years, Vic decided he couldn't fully understand Vermont's iron industry unless he also understood about charcoal production. And one kiln leading to another kiln, he further complicated (and extended) his efforts by embarking on the study of lime manufacture. Each year since 1978 Vic drove and walked more miles, studied more documents, and provided the State of Vermont with ever more information.

Those of us who study Vermont's rich prehistoric and historic legacy well know that so much of our heritage is little known and, consequently, insufficiently appreciated. The complex stories of Vermont's once thriving iron, charcoal, and lime producing industries lay virtually forgotten in forest and field, in libraries and attics, until Vic's exhaustive effort brought this part of Vermont's heritage to light. Vic's research has revealed stories of new inventions and technologies; of land exploitation and family intrigues; of big business and famous men; of once thriving communities now long abandoned; of economic forces that affected many people and many places; and of hundreds of working people and their families over many decades whose lives centered on these industries but about whom so little was recorded.

There is no doubt that Vic's devoted and extraordinary efforts—all on a volunteer basis—have immeasurably enriched our knowledge about several of Vermont's most vital but, until now, little known industrial endeavors. There is no way to thank someone who has done so much for the people of Vermont, in general, and for the Division for Historic Preservation, in particular. I hope that this volume gives him some measure of reward for an immense job well done (and, he would say, still not finished). I also hope that all of us in Vermont who share responsibility for these parts of our heritage—as property owners, as custodians of public lands, as historians and archeologists, as users of the land, as citizens interested in our communities' history—will heed Vic's words when he reminds us that this is a fragile, irreplaceable heritage that needs to be protected and cared for and, in some cases, interpreted for the interested public. By learning about and better appreciating—through reading this volume—the important role of these archeological sites in the history of our state and our communities, I hope that we will be better armed in our efforts to preserve this forgotten legacy of our history for future generations of Vermonters.

*Giovanna Peebles, State Archeologist  
Vermont Division for Historic Preservation  
Montpelier, Vermont*

As I grew up in southern Vermont, I frequently wondered for what purpose the massive stone chimney-like structure on the west side of then U.S. Route 7 in the South Village of East Dorset had been constructed. With no knowledge of any similar structures, and aware that there was little manufacturing activity in the community, I would not be enlightened for many years. I did, however, become somewhat familiar over the years with other types of industrial sites: charcoal kilns observable at a number of places along the Long Trail, and lime kilns located in Manchester.

I was to learn much more about all of these, though, as a result of subsequently serving as program chairman of the Rutland Historical Society. Frequently wondering where I could find speakers to fill a schedule of monthly programs, I learned that there was a person from Pittsfield, Massachusetts, who was an authority on Vermont's early iron industry. Unaware, like many people, I suspect, that Vermont had ever had an iron industry, I invited Vic Rolando to give his slide-illustrated presentation. That evening I learned that the chimney-like structure in East Dorset was the stack of a blast furnace that had produced iron from about 1846 to 1854, and learned much more about the charcoal kilns along the Long Trail.

Just as I had unwittingly encountered my first Vermont iron blast furnace in the South Village of East Dorset in my youth, so had I encountered circular brick remains while hiking along the Long Trail. I had been told by older family members that these were "charcoal kilns," but no one had ever been able to tell me for what all this charcoal had been used. During the Rutland Historical Society presentation, Vic revealed that the fuel employed to heat the iron ore and separate the iron from the ore was charcoal and that blast furnaces had required great amounts of charcoal.

The importance of Vic Rolando's research and site documentation is to make evident to Vermonters that the state had industrial activity from earliest times and that in that activity lay the origins of our current manufacturing industries. Moreover, he makes clear to us the wide extent of that activity. He has found archival or field evidence of iron furnaces, forges, and foundries operating throughout the state in the 19th century and foundries that are still in operation.

It has been a privilege and pleasure to make Vic Rolando's acquaintance, to search Vermont for early industrial sites with him, and to critique this important book as he developed it. Vic has made a major contribution to the study of Vermont history and industrial archeology not only by documenting much of Vermont's early industrial activity in this thoroughly researched volume, but also by locating the sites of this activity at a time when natural deterioration or human development activities threaten them. Vic's research activities and preparation of site reports for the Vermont Division for Historic Preservation and the Green Mountain National Forest have already stimulated research in this area and interest in protecting these sites, and the most significant contribution of his book is that it will stimulate even more.

*Robert Edward West  
Manchester, Vermont*

## Preface

---

On April 28, 1978, I “discovered” Vermont through the attendance of a one-day seminar on historic preservation presented by Chester Liebs at the University of Vermont. I was at that time residing in New York State, commuting daily to Pittsfield, Massachusetts, where I was a technical publications editor at the General Electric Company Ordnance Systems Department. I was also very involved in my graduate thesis at The College of Saint Rose, the thesis being a study of 19th-century ironworks in New York State.

I knew of the existence of only three blast furnace sites in Vermont; but an invitation to present a paper to the Vermont Archaeological Society (VAS) later that year in Burlington motivated me to do some further research into the early iron-making history of that state. And it was at some obscure moment in the midst of my warmly received presentation to the VAS later that October that I decided to switch my area of thesis research from New York State to Vermont.

The decision did not seem all that momentous at the time, since Vermont is much smaller than New York and therefore had fewer ironworks sites. After receiving faculty permission to make the thesis switch, I figured I had traded into an easier project. But the easier project soon developed into a major effort that found me spending many lunch hours and evenings after work doing library research in Pittsfield, and holidays, weekends, and summer vacations from GE driving to Vermont’s mountains and valleys, searching out clues to the whereabouts of blast furnaces, forges, and charcoal kilns. Secondary road touring gave way to fearful wilderness driving on many well-furrowed, narrow, and boulder-strewn back roads that seemed never to end but led ever upward, over relentless miles of curves and through pond-sized puddles (County Road from Pownal to Stamford, for example). Early on, I learned firsthand what “the mud season” meant. And since successful completion of both thesis and graduate studies in history in 1980 (including some transfer credits from UVM), my strong and continuing interest in the subject of this work is best reflected by my little green “I Love Vermont” bumper sticker.

This work is not meant to be a comprehensive history of the entire iron, charcoal, and lime industries of Vermont. It is hoped, however, that most of the published and unpublished data relating specifically to these industries in Vermont have been pulled together. All known blast furnace sites have been inspected. Most bloomery forge and foundry sites were inspected where something was expected to be found, plus others where it was expected that little, if anything, would be found. Hundreds of charcoal mounds, charcoal kilns, and lime kilns have been found. Almost all sites took hours of library research and often days of field work to find, resulting in the development of a research and field technique.

Although this work represents research accomplished during the 15-year period from 1978 through 1992, it was research restricted by time constraints that resulted from living and working full-time in Massachusetts. (On March 1, 1992 I retired from GE Aerospace in Pittsfield, Mass., and on August 5, I finally became a full-time Vermont taxpayer.) This left weekends, holidays, and personal vacation time for Vermont that was not otherwise committed to house and auto maintenance, or limited by some scary winter driving conditions. Time was made for one-day “quick runs” to the

Vermont Historical Society Library, Montpelier, for instance, to check out some gnawing question, or to a mountaintop at Mount Tabor to recheck some charcoal kiln detail not found during the previous visit. Some one-day trips took me as far north as Highgate, Troy, and Richford. Many one-week trips were made for field and library work with nights spent at small motels, tourist homes, or camping. As such, it is obvious that the research was not continuous, but rather an on-again, off-again struggle, with keeping track of numbers of clues, notes, photo negatives, personal contacts, and subjects of interest all squeezed between days at work or weekends answering to the domestic needs of my life.

Thousands of miles were driven throughout the Northeast in search of materials relative to this project; hundreds of hours were spent in libraries and at home poring over books, maps, and photographs (and orthophotos); hundreds of miles were hiked from the crests of the beautiful Green Mountains to the sometimes fetid village streams. And no activity in pursuit of research materials was reimbursed through any grant or fellowship.

I have a sense of satisfaction from exploring Vermont and finding the remnants of so many industrial activities, the remaining artifacts of which are unknown to most Vermonters themselves. But most important, a small niche in the passing scene of Vermont history has been yanked back from certain oblivion for our mutual study and appreciation and, I hope, its preservation. The tottering old furnace stack at Forest Dale, a surviving, silent sentinel of an otherwise nearly forgotten era—will that interpretive park ever be built? Might there someday in fact be a “life after death” for the old stone soldier?

The quantity and quality of ruins studied in Vermont emphasize this state’s significant position in the availability of physical IA research materials in the Northeast. The reporting of these sites to the State Archeological Inventory has provided the Vermont Division for Historic Preservation and the United States Forest Service a valuable basic tool with which to work. The results of this undertaking underscore the need to look beyond the better-known, more visible IA ruins (such as standing blast furnaces and factory structures) and to search out and study less well-known and less visible sites (such as charcoal kilns and lime kilns) in the more remote corners of the countryside.

Information collected thus far will not become static but will serve as a guide toward continuing IA research in Vermont. As time passes, new data regarding the early iron, charcoal, and lime industries in this state will become available, further contributing both to the understanding of the broader context of these early industries and to the significance of the parts that make up the whole.

One result of this study should be to dispel the popular myth that the early history of Vermont was strictly that of making maple syrup and milking cows. Most important, however, is the hope that this study will encourage residents, students, historians, tourists, developers, property owners, legislators, environmentalists, and archeologists—all stewards of the land—to become more aware of both the range of these early industries and the quality, quantity, and value of their surviving fragile remains; and that it will inspire further work toward a broad, intense, and in-depth research into the industrial archeology of Vermont so that our generation and future generations may be able to appreciate and understand the industrial heritage of this truly beautiful state.



## Acknowledgements

My research in Vermont was made possible through the support of many friends with various levels of interest in investigating, recording, and preserving these nearly forgotten industries, and by the staff of the Vermont Division for Historic Preservation, Vermont State Papers Library, and Vermont Historical Society Library at Montpelier; the Vermont Statehood Bicentennial Commission, the Vermont Mapping Program at Waterbury, the Special Collections Library at UVM, the Shelburne Museum, the Bennington Museum, the Sheldon Museum at Middlebury, the Rokeby Museum at Ferrisburgh, the Russell Collection at Arlington, the Mark Skinner Library at Manchester, the Bixby Memorial Library at Vergennes, the Rutland Free Library, the little Tyson Library at Plymouth, the Berkshire Athenaeum Local History Room at Pittsfield, Mass., the State University of New York Library at Albany, the New York State Historical Association Library at Cooperstown, the Green Mountain National Forest District Offices at Manchester, Rutland, and Middlebury, and the Green Mountain Race Track at Pownal; the officers and members of the Vermont Archaeological Society, the New Hampshire Archaeological Society, and the Rutland Historical Society; historical societies at Barton, Danby-Mount Tabor, Manchester, Pittsford, Swanton, Timmouthe, and Woodstock; the Society for Industrial Archeology and its Northern and Southern New England Chapters, and the Council for Northeast Historical Archeology; and also Parks Canada, the Vermont State Police, Vermont Castings, Inc., White Pigment Corp., the Connecticut Charcoal Company at Union, Conn., Dover Publications, Inc. for permission to copy Diderot illustrations, the Hagley Museum and Library, Wilmington, Del., the CTC Photographic Corp. at Bennington, and Master Darkroom at Pittsfield, Mass.

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"Griffy," my field companion, part Labrador and part whatever, was born the runt of a litter of 10 on May 19, 1983, and accompanied me everywhere in Vermont, exploring all the streams and ruins along the way. She was coal black and so I named her for Silas Griffith, charcoal baron of Mount Tabor. She endured the long, boring drives to Vermont in the back of the pickup, coming alive when we started bouncing on rough back roads, and shot for the woods at the drop of the tailgate. We shared cool streams on hot days and a sleeping bag on cold nights. She patiently waited for me to return from the many offices and libraries to which this work took me, usually whiling away the hours by successfully begging handouts of ice cream and donuts from students passing through the parking lots, the grassy edges of which she roamed to the limit of her 20-foot chain. Griffy was instantly killed on February 25, 1988 in front of her house by a hit-and-run driver when she ran into the street instead of hopping into the pickup. I've never gotten over her absence in the woods.

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Christopher Rolando accompanied me on hiking expeditions to ironworks in New York and New England; twenty-three years ago at the age of nine, he had already stood in the shadows of more 19th-century blast furnace ruins than most historians knew existed. My son disassembled and repaired my Datsun engine on the kitchen floor and camped for a month on the roof of McDonald's in Pittsfield, Mass. (he comes from fine Rolando stock). Chris also provides me with valuable PC support; I don't know what I would do without him.

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*Victor Renato Rolando*  
Manchester, Vermont