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11. A Doctoral Program in Industrial Heritage and Archaeology at Michigan Tech[14]

by Bruce E. Seely and Patrick E. Martin[15]

Introduction

> *Ph.D. students in industrial archaeology are beginning to emerge. There are not yet enough of them.*
>
> Marilyn Palmer, University of Leicester, 2000.[16]

In the fall of 2005, the Department of Social Sciences at Michigan Technological University (Michigan Tech) launched an interdisciplinary doctoral program in industrial heritage and archaeology. The effort is built upon a successful and unique master's program in industrial archaeology begun at Michigan Tech in 1991. About the program, some observers have commented

> *[Although] a number of U.S. institutions of higher learning offer programs of study in archaeology; only Michigan Technological University offers a degree specifically in industrial archaeology. MTU's Master of Science program stresses an interdisciplinary approach to the field that includes the study of archaeology, historic preservation, the history of technology, and anthropology.*[17]

Indeed, only a handful of schools, notably the Ironbridge Institute and the University of Leicester in England, offer graduate degrees in this field.[18] The Department believes an opportunity is emerging for graduates interested in heritage management, who hold a doctorate, and who are broadly prepared to study and interpret the history of industry and labour through its material culture. What follows is a justification for developing a doctoral program and the basic outline of the program at Michigan Tech.

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[14] This text is cited from *The Journal of Heritage Stewardship*, vol. 3 Number 1 Winter 2006

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[16] Marilyn Palmer, "Archeology or Heritage Management: The Conflict of Objectives in the Training of Industrial Archeologists," *Industrial Archeology* 26, no. 2 (2000): 54.

[17] William Crandall, Alan Rowe, and John A. Parnell, "New Frontiers in Management Research: The Case for Industrial Archeology," *The Coastal Business Journal* 2, no. 1 (fall 2003): 57.

[18] See http://www.ironbridge.bham.ac.uk/, accessed December 1, 2005.

Intellectual Origins

Scholars interested in cultural heritage have found their way to the field from a variety of academic disciplines, including history, American studies, museum studies, decorative arts and material cultures studies, library and archival management, architectural history, archaeology, and historic preservation. For those interested in the specific domain of industrial heritage, two regular points of entry have been through the history of technology and industrial archaeology even though these related fields approach heritage questions differently. The crucial commonality between these two areas has been the shared interest of scholars in both domains in the physical reality of technology. Indeed, John Staudenmaier, editor of the journal Technology and Culture, has identified this interest in what happens inside the "black box" of technological artefacts and systems as a defining attribute of the history of technology, even with the growing popularity of newer theoretical approaches.[19]

For several reasons, industrial archaeology originated independently in England during the early 1960s. Many physical features of the Industrial Revolution (mills, factories, smelters, mines, and canals) were falling victim to the wrecker's ball and urban renewal. Concerned individuals pressed for the preservation and study of the history and significance of structures and sites that marked high points of this period in British history. Further, a community of enthusiasts existed among engineers, mechanics, and workers, as well as historians of technology and museum curators who were committed to preserving evidence of England's past industrial leadership, such as steam engines, locomotives, factories, and machine tools. Several centres of activity emerged, including London, Bristol, Bath, and the Midlands, in particular the area around Ironbridge, where iron was first smelted with coke fuel and a spectacular cast iron arch bridge still stands. The scholarship of historical archaeologist Kenneth Hudson carried word of industrial archaeology to North America and beyond in the 1960s and 1970s.[20]

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[19] See Brooke Hindle, *Technology in Early America: Needs and Opportunities for Study* (Chapel Hill: University of North Carolina Press, 1966); Robert Post, "Technology in Early America: A View from the 1990s," in Judith A. McGaw, *Early American Technology: Making and Doing Things from the Colonial Era to 1850* (Charlotte: University of North Carolina Press, 1994): 16-39; John M. Staudenmaier, "Rationality, Agency, Contingency: Recent Trends in the History of Technology," *Reviews in American History* 30, no. 1 (2002): 170.

[20] Barrie Trinder, "Coming to Terms with the 20th Century: Changing Perceptions of the British Industrial Revolution," *Industrial Archeology* 26, no. 2 (2000): 65-80. Early British supporters included professor Angus Buchanan and Ironbridge director Neil Cossons. See R. A. Buchanan and Neil Cossons, *The Industrial Archaeology of the Bristol Region* (New York, NY: A.M. Kelley Publishers, 1969); and R. A. Buchanan, *Industrial Archeology in Britain* (Harmondsworth, UK: Penguin, 1972). Kenneth Hudson has published a number of books, of which the most important are *Industrial Archaeology: An introduction* (London, UK:

Over the past three decades, interest in industrial archaeology has expanded on an international front as work in this field has become more closely connected to cultural resource management. Developments have been most pronounced in Europe, but in the United States, federal, state, and local regulations related to historic preservation and the preparation of impact statements have required greater attention to the documentation and preservation of significant cultural resources.

An important signal of the expanding interest in industrial archaeology was the establishment of an umbrella group, the International Committee for the Conservation of the Industrial Heritage (TICCIH), in 1978. This organization grew out of the First International Congress on the Conservation of Industrial Monuments (FICCIM) held at Ironbridge in 1971. As conference organizer Barrie Trinder later recollected, "There was no international network linking people interested in the industrial past in 1973. It seemed a considerable achievement to bring together 61 people. from Canada, East and West Germany, Ireland, the Netherlands, Sweden and the United States."[21] By 2000, TICCIH had delegates from 54 countries, and its meeting attracted more than 200 participants. Moreover, TICCIH became the scientific advisor on industrial heritage to UNESCO's International Council on Monuments and Sites (ICOMOS).

The inclusion of the word heritage in TICCIH's name points to a vital development that has broadened the possibilities associated with industrial archaeology. During the last quarter century, preservation and interpretation of the remains of industry have become a matter of interest to a much wider circle of scholars, extending well beyond those interested in industrial archaeology.

Clearly, the preservation of industrial artefacts and sites fits into the larger international movement to preserve the world's historic sites and monuments. Symbolizing this shift was the inclusion of industrial structures on UNESCO's World Heritage List. By 1990, the term industrial heritage was widely used in Europe, as interest in preserving, restoring, and interpreting historic industrial sites spread from England, to the continent, and beyond.[22]

Baker, 1966); *Handbook for Industrial Archaeologists: A Guide to Fieldwork and Research* (London, UK: Baker, 1967); and *World Industrial Archaeology* (New York, NY: Cambridge University Press, 1979).

[21] Barrie Trinder, "From FICCIM to TICCIH 2000: Reflections on 27 years," *TICCIH Bulletin* (October 2000); See also http://www.mnactec.com/TICCIH/, accessed December 1, 2005.

[22] See http://www.international.icomos.org/about.htm, accessed December 1, 2005. The World Heritage List is available online at http://whc.unesco.org/en/list/, accessed December 2, 2005. An early use of the term was

The placement of industrial sites on the World Heritage List produced another incentive for work in the field: heritage tourism.[23] In fact, a dozen of the most recent additions to UNESCO's World Heritage List are industrial sites and landscapes.[24] A successful project in Germany's iron and steel region resulted in the establishment of the Route of Industrial Heritage of the Ruhr. This concept was recently expanded into a European Route of Industrial Heritage, and similar regional efforts are to be found throughout Europe.[25]

In North America, the level of recognition of industrial heritage has not yet matched that of Europe, but the Lowell and Keweenaw National Historical Parks, the America's Industrial Heritage Park project focusing on the steel industry in southwestern Pennsylvania, and the Motor Cities National Heritage Area centred on Detroit are examples of emerging interest within the past two decades.[26] Each site involves local, state, federal, and corporate partners. Other factors also have heightened demand for broader professionalism in the cultural resource management field in the United States and elsewhere. Environmental requirements governing development projects, such as environmental impact statements mandated by legislation and regulations, have opened pathways for professional practitioners over the last 30 years, especially for archaeologists. This pattern of growth reflects significant connections between industrial archaeology and industrial heritage as a branch of cultural resource management. That link appears problematic to some, notably Marilyn Palmer at the University of Leicester, who has worked to bring industrial archaeology into the mainstream of university archaeology departments as a recognized period study. To do so, she argues, industrial archaeologists might have to leave the conservation and preservation of industrial

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Aubrey Wilson and Joseph McKeown, *London's Industrial Heritage* (Newton Abbot, UK: David & Charles, 1967).

[23] On heritage tourism, see Heather Mary Worrall, *The Impact of Industrial Heritage Related Tourism on Tayside Region* (Thesis, University of Dundee, 1996); Deborah Baldwin, *Experiencing Heritage: Making Sense of Industrial Heritage Tourism* (Thesis, University of Bristol, 1999); also Claude Moulin and Priscilla Boniface, "Routeing Heritage for Tourism: Making Heritage and Cultural Tourism Networks for Socio-Economic Development," *International Journal of Heritage Studies* 7, no. 3 (2001): 237-248.

[24] On industrial heritage sites, see http://whc.unesco.org/sites/industrial.htm, accessed December 2, 2005; and Henry Cleere, "The World Heritage Convention as a Medium for Promoting the Industrial Heritage," *Industrial Archeology* 26, no. 2 (2000): 31-42.

[25] On the Ruhr project see http://www.route-industriekultur.de/steuer/menue/menue.htm, accessed December 2, 2005; on the wider European project see http://www.nweurope.org/page/projet.php? p=31&id=548, accessed December 2, 2005.

[26] On the Lowell and Keweenaw Parks, see http://www.nps.gov/lowe/ and http://www.nps.gov/ kewe/; on the America's Industrial Heritage Project see http://www.sphpc.org/sphpc1/ about_sphpc.htm, accessed December 2, 2005; on the Motor Cities National Heritage Area, see http://www.experienceeverythingautomotive.org, accessed December 22, 2005.

heritage to others.[27] This position reflects somewhat stronger links between traditional archaeology programs and industrial archaeology in England than in the United States.

The authors think differently, believing that industrial archaeology and industrial heritage are mutually reinforcing. The program at Michigan Tech explicitly seeks to meet the growing demand for highly trained and academically certified historians of technology and industrial archaeologists in academic and non-academic markets. Michigan Tech's experience teaching graduate students suggests that the two years required for the master's degree are no longer sufficient for providing the depth of training some research projects require. Industrial heritage scholars should be knowledgeable in three core areas: the history of technology; the use of archaeological tools and the interpretation of artefacts; and the basic issues surrounding cultural resource management vis-à-vis industrial heritage. Stronger academic credentials would also allow graduates to rise to the highest positions in the public and private sectors. The emerging pattern resembles the path historians of technology and historical archaeologists followed after 1950 as both developed opportunities within classic academic departments that traditionally did not include them. The authors also believe that industrial archaeologists and heritage specialists are likely to enter academic and non–academic positions on the basis of their work, not through connections to traditional academic disciplines.

Yet, educational programs that prepare scholars, researchers, and historical site administrators for heritage related tasks at any level, academic or otherwise, have been limited in number. The earliest and most important program is at Ironbridge in England. Now known as the Ironbridge Institute, this program is affiliated with the University of Birmingham and offers master's degrees and diplomas in Heritage Management and Industrial Archaeology, as well as a certificate in Museum Management. In addition, the program awards research-based advanced degrees.[28] A handful of academic programs exist elsewhere, including a small industrial archaeology group at the University of Leicester, which awards a master's degree in archaeology and heritage via distance learning. The University of Exeter offers a master's in mining archaeology and mining heritage

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[27] See Palmer, "Archaeology or Heritage Management," 49-54.

[28] The Ironbridge Institute also awards Master of Philosophy (M.Phil.) and Doctor of Philosophy (Ph.D.) degrees. See the program's web page at http://www.ironbridge.bham.ac.uk/higher-degrees.htm, accessed December 2, 2005.

management. In Stockholm, an excellent industrial heritage research program created by Marie Nisser at the Royal Institute of Technology awards the doctorate.[29]

Graduate programs at a handful of universities in the United States devote some attention to industrial archaeology. The University of Vermont's historic preservation program, founded in 1975, covered industrial archaeology, thanks to the interest of program founder Chester Liebs. A similar program at George Washington University offered industrial archaeology courses in the late 1970s. By the 1980s, such courses could be found at Rensselaer Polytechnic Institute, and by the end of the decade West Virginia University had formed an Institute for the History of Technology and Industrial Archaeology under the direction of Emory Kemp. Perhaps the most important training ground for industrial archaeologists was the Historic American (HAER), organized in the National Park Service in 1969. A sister to the older Historic American Buildings Survey, HAER records significant industrial sites and structures. The agency uses teams of architects and historians to produce measured and interpretive drawings and historical monographs, along with professional quality photographs. Many HAER recording team members were graduate students or young professionals who received their first industrial archaeology field experience on these projects.[30]

Over the past several years, a number of U.S. schools have responded to the growing interest in heritage studies with new programs. Arkansas State University in Jonesboro, for example, offers a doctoral program in heritage studies that focuses on the history of the Mississippi Delta region. The Tsongas Industrial History Center in the Graduate School of Education at the University of Massachusetts at Lowell offers training and other guidance in teaching the history of the American Industrial Revolution. The Center for Heritage Resource Studies at the University of Maryland, formed in December 2000, emphasizes the connection between heritage and the environment, offering a master's in applied archaeology, and the

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[29] Palmer, "Archaeology or Heritage Management," 52-54. Industrial heritage research at the Royal Institute of Technology in Sweden is part of the research effort on "Scientific research—technological change—industrial renewal." See http://www.kth.se/forskning/pocket/ project.asp?id=2102, accessed December 2, 2005. On other European programs, see links on the Association of Industrial Archaeology website, http://www.industrial-archaeology.org.uk/alink.htm, accessed December 2, 2005.

[30] On West Virginia University's Institute for the History of Technology and Industrial Archaeology, see http://www.as.wvu.edu/ihtia/, accessed December 2, 2005. On HAER, see Eric DeLony, "HAER and the Recording of Technological Heritage: Reflections on 30 Years' Work," *Industrial Archeology* 25, no. 1 (1999): 5-28; and idem, "HAER Recording Projects Conducted by the Washington Office, 1969-1998," *Industrial Archeology* 25, no. 1 (1999): 29-55. Four of Michigan Tech's faculty have significant experience with HAER and HABS.

University of Montana has recently announced a Ph.D. in anthropology with a specialization in cultural heritage studies. However, none of these programs has industrial heritage as its main focus.[31]

The Master's Degree Program at Michigan Tech

Against this backdrop of limited educational opportunities, the Department of Social Sciences at Michigan Tech inaugurated a master of science program in industrial archaeology in 1991.[32]

From the outset, the program's guiding principle, as restated recently by historian Larry Gross, has been that industrial archaeology should be based on the "direct knowledge of objets d'industrie."[33] The program's core educational philosophy is one that integrates the history of technology with historical archaeology to emphasize the material culture of industry.[34]

The historians on the faculty all have field experience in industrial archaeology. Larry Lankton was historian of technology at HAER in the mid 1970s; Alison Hoagland was senior historian at the Historic American Buildings Survey in the 1980s and early 1990s. Terry Reynolds and co-author Bruce Seely worked as HAER summer historians on several projects, and both won awards for articles published in IA: The Journal of the Society for Industrial Archeology. Hoagland's background is in historic preservation, and her research interests are in architectural history and material culture. Lankton, who was Curator of Power and Shop Machinery at the Henry Ford Museum before going to HAER, brings experience in the

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[31] For information on the University of Arkansas program, see http://www.clt.astate.edu/heritagestudies/mission.htm; for the University of Maryland, see http://www.heritage.umd.edu/INDEX.htm; for the University of Massachusetts, see http://www.uml.edu/tsongas/index2.htm; for the University of Montana, see http://www.anthro.umt.edu/graduate/phd.htm; all accessed December 12, 2005.

[32] Michigan Tech's master's program is the only degree-granting program in industrial archeology in the United States.

[33] Larry Gross, "Industrial Archeology: An Aggressive Agenda," *Industrial Archeology* 27, no. 1 (2001): 39. Gross made a similar point earlier in "The Importance of Research Outside the Library: Watkins Mills, A Case Study," *Industrial Archeology* 7, no. 1 (1981): 15-26; as did Bruce Seely in his article, "Blast Furnace Technology in the Nineteenth Century: A Case Study," *Industrial Archeology* 7 (April 1981): 27-54. Many articles in SIA's journal emphasize this point. See Robert B. Gordon, "Material Evidence of Ironmaking Techniques," *Industrial Archeology* 21, no. 2 (1995): 69-80; and idem, "Analysis and Interpretation of Artifacts in Industrial Archeology," *Industrial Archeology* 26 no. 1 (2000): 103-111.

[34] Patrick E. Martin, "Training Industrial Heritage Professionals at Michigan Technological University," Proceedings from Future's Past; An International Seminar on Conservation and Regeneration of Industrial Heritage through Training and Research (Stockholm, Sweden: Royal Institute of Technology, 2004); and idem, "The Importance of Networking and the American IA Experience" Proceedings from Nordrhein- Westphalia Symposium on Industrial Heritage (Duisburg, Germany: Deutsche Gesellschaft fur Industriekultur, 2001).

interpretation of artefacts and the material culture of industry and work, with a special focus on copper mining. Historian of technology Hugh Gorman brings expertise in environmental history and policy—a matter of increasing importance at industrial sites.

A second key faculty group includes archaeologists and anthropologists. Carol MacLennan focuses on work and workers, the anthropology of industry, and theoretical approaches such as political ecology. Susan Martin's graduate teaching focus is on heritage management, while her research has emphasized the development and use of metallic copper by Native Americans. Archaeologists Timothy Scarlett and co-author Patrick Martin have conducted digs throughout Michigan; Scarlett also focuses on the Mormon pottery industry in Utah, and Martin directs the annual field school, which is the centrepiece of the program.

Students in the Michigan Tech program master excavation techniques as well as scientific tools, such as ground penetrating radar, dating technologies, and global positioning (GPS) and geographic information (GIS) systems technologies. These formal archaeological skills, combined with historical research techniques, distinguish Michigan Tech's efforts from other archaeology education programs. The proving ground is a required field experience, usually as part of the annual field school. Excavations have taken place throughout the Upper Peninsula of Michigan and have included a blacksmith's shop and lighthouse at Ft. Wilkins State Park in Copper Harbor; iron furnaces, bloomary forges, and kilns at Munising, Negaunee, and Fayette; and copper mining activities near Victoria.[35] Not all fieldwork has focused on industrial equipment. At Fayette, students excavated a boarding house and accompanying 2-story privy to learn more about the lives of 19th-century ironworkers. Other students have pursued externally funded projects in the West Indies, Wisconsin, Kentucky, Alaska, and California.[36]

The master's program has served Michigan Tech's students well.[37] A total of 63 students entered between 1991 and 2004; 43 have completed degrees. Ten graduates have pursued

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[35] At the last site, participants unearthed a surprisingly intact Cornish buddle used to separate metallic copper from crushed rock. Although made largely of wood, the device had been buried in stamp sands with a high copper content, thus preserving the wood.

[36] On the field schools, see http://www.industrialarchaeology.net/IAWeb/iaprojects/projects.html, accessed December 2, 2005. See also David B. Landon and Timothy A. Tumberg, "Archeological Perspectives on the Diffusion of Technology: An Example from the Ohio Trap Rock Mine Site," IA 22, no. 2 (1996): 40-57; and David Landon, Patrick Martin, Andrew Sewell, Paul White, Timothy Tumberg, and Jason Menard, "'A Monument to Misguided Enterprise': The Carp River Bloomary Iron Forge," IA 27, no. 2 (2001): 5-22.

[37] An external review of the program conducted in 2002 is available online at http://www.social.mtu.edu/documents/ReportonDeptSSMTU.doc, accessed December 2, 2005. See also Jed Weisberger, "Industrial Archaeology Master's Program, Michigan Technological University: Leading the Way

doctorates, while 26 hold positions in cultural resource management and engineering consulting firms or in federal and state agencies. As noted above, however, changes in industrial heritage suggest the need for broader and deeper educational and research experiences.

From Master's to Doctorate in Industrial Heritage and Archaeology

The doctoral program in industrial heritage and archaeology is a natural extension of Michigan Tech's master's program. Like the master's, the doctoral program springs from the same foundation of core classes in the history of technology, historical archaeology, material culture, the documentation of historic structures, industrial archaeology, methods of archaeology, and heritage management. A grant from the National Science Foundation's Program in Science and Technology Studies made it possible for the Department of Social Sciences to add other elements to the doctoral program. Doctoral students pursue individualized programs of study that rely heavily on directed reading with faculty, and they participate in seminars intended to help shape intellectual explorations of critical issues in industrial heritage.

The first of these seminars focuses specifically on industrial heritage, including the nature of heritage, the relationship of heritage to history, questions related to advanced cultural resource and heritage management, heritage tourism, industrial heritage field methods, and material culture and museum studies. A second seminar emphasizes industrial history, including the global history of industrialization, theoretical models of industrial evolution, and the social history of technology and work. The Department anticipates additional seminars tailored to the specific interests of students. Students must also take three classes from a list that includes GIS techniques, archaeological field methods, geophysics for archaeology, architectural history, regional history, and environmental history.

One of the distinguishing characteristics of the doctoral program is its core intellectual focus on material culture. Scholarly interest in this area is not new, dating back at least to the

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in a Developing Genre," Journal of Higher Education Strategists 2 (summer 2003): 201-206. See also William Crandall, Alan Rowe, and John A. Parnell, "New Frontiers in Management Research: The Case for Industrial Archeology," *The Coastal Business Journal* 2, no. 1 (fall 2003): 45-60; and Patrick E. Martin, "Industrial Archeology and Historic Mining Studies at Michigan Tech," *CRM Magazine* 21, no. 7 (1998): 4-7.

1950s if not earlier.[38] In 1996, the Journal of Material Culture first appeared, building on the base established by scholars such as Henry Glassie, Thomas Schlereth, and Kenneth Ames.[39] Their work has held up amazingly well, but new insights continue to emerge from different points of the academic compass.[40] The focus at Michigan Tech is particularly informed by the work of researchers oriented to technology, specifically the work of David Kingery, Patrick Malone, and Steven Lubar, in large part because Michigan Tech is surrounded by the remains of Michigan's copper mining industry.[41]

The program expects to draw upon faculty from other departments at the university, notably the Geological Engineering, Forest Resources, and Environmental Sciences, and Materials Science and Engineering Departments, to teach classes in pivotal technical methodologies. The program already depends heavily on the University Archives and Copper Country Historical Collection in the University Library for essential resources on local copper mining and other industrial activities and has developed important relationships with museums, state bureaus, and federal agencies that may be of benefit to students seeking curatorial or administrative experience.

Mindful of European leadership in the area of industrial heritage, the Department is creating mechanisms for annual faculty and student exchanges and an international visitor in residence program at Michigan Tech. Scholars at four European institutions have already expressed interest in developing cooperative relationships with the doctoral program. Such

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[38] In 1952, the Henry Francis du Pont Winterthur Museum and the University of Delaware established the Winterthur Program in Early American Culture, a recognized leader in the study of American decorative arts and material culture.

[39] Henry H. Glassie, *Pattern in The Material Folk Culture of the Eastern United States* (Philadelphia: University of Pennsylvania Press, 1968); Thomas J. Schlereth, *Material Culture Studies in America* (Nashville, TN: American Association for State and Local History, 1982); Kenneth L. Ames and Thomas J. Schlereth, *Material Culture: A Research Guide* (Lawrence: University Press of Kansas, 1985); Henry Glassie, Material Culture (Bloomington: Indiana University Press, 1999).

[40] Despite the plurality of opinions on material culture that have surfaced over the years, they all stem from roughly the same premise, namely, that artefacts offer an important source of information unlike anything found in written texts. This point runs through the chapters of Ann Smart Martin and J. Ritchie Garrison, eds., *American Material Culture: The Shape of the Field* (Winterthur, DE, and Knoxville, TN: Henry Francis du Pont Winterthur Museum and the University of Tennessee Press, 1997).

[41] Steven D. Lubar and W.D. Kingery, *History From Things: Essays on Material Culture* (Washington, DC: Smithsonian Institution Press, 1993); W.D. Kingery, *Learning From Things: Method and Theory of Material Culture Studies* (Washington, DC: Smithsonian Institution Press, 1996); Robert B. Gordon and Patrick M. Malone, *The Texture of Industry: An Archaeological View of The Industrialization of North America* (New York, NY: Oxford University Press, 1994); Edward Jay Pershey, "Handling History: Using Material Culture to Create New Perspectives on the Role of Technology in Society," *Magazine of History* 12, no. 2 (1998): 18-24. See also contributions from archaeologists, including James M. Skibo and William H. Walker, *Expanding Archaeology* (Salt Lake City: University of Utah Press, 1995), and Peter Bleed, "Why Do Artifacts Look the Way They Do?" *Reviews in Anthropology* 22, no. 1 (1993): 41.

international participation will vastly enrich the doctoral program while at the same time contribute to improved communication among leading international organizations in industrial archaeology.

Graduate and Faculty Research Opportunities

While research has always been a key aspect of the master's program, the doctoral program warrants projects of greater scope. Michigan Tech is currently engaged in a multi-year investigation of the site of the West Point Foundry in Cold Spring, New York, one of the nation's most important antebellum manufacturing centres and producers of steam engines, locomotives, and cannon (figure 1).

F*igure 1: This graduate student in Michigan Tech's industrial archaeology program is surveying a wall at the West Point Foundry site in Cold Spring, New York, during the program's annual field school. (Courtesy of the authors)*

Working in partnership with the Scenic Hudson Land Trust, the program has already conducted four annual field schools on the site during the summer months and anticipates another five to seven years of fieldwork. The authors expect several dissertation topics to

come out of the project, ranging from the history of the foundry and its industrial archaeology to working conditions and worker housing in Cold Spring and the environmental history of the West Point Foundry site.

Equally exciting is the prospect of large-scale international projects, the first of which began in 2004. Michigan Tech led an international team on a project to document coal-mining activities on the Svalbard archipelago north of Norway.[42] The island's coal mines were opened at the turn of the 20th century by Michigan native John M. Longyear and managed by graduates of the Michigan School of Mines, the forerunner to Michigan Tech.[43] Documenting the archipelago's many physical remains highlights the intimate relationship between the history of technology and material culture. Significantly, the material culture of every scientific or industrial endeavour on Svalbard from before 1946 is specifically protected by historic preservation laws.

The Concept of Heritage

The research projects at West Point, Svalbard, and elsewhere offer students and faculty valuable opportunities to address fundamental issues related to the concept of heritage. A number of scholars have problematized the very idea of heritage in recent years; some have been openly critical of the entire concept.[44] David Lowenthal has offered perhaps the most thoughtful critiques, observing recently that "[a]ll at once, heritage is everywhere—in the news, in the movies, in the marketplace—in everything from galaxies to genes. It is the chief focus of patriotism and a prime lure of tourism. One can barely move without bumping into a heritage site."[45] At the core of Lowenthal's critique is the call to recognize the important distinction between history and heritage—a distinction that is all too often overlooked in

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[42] The international team included Miles Ogelthorpe and Ian West from England, L. Hacquebord from the Netherlands, Marie Nisser from Sweden, and participants from Norway's National Technical University in Trondheim. Michigan Tech's role in the project was made possible by a Small Grant for Exploratory Research (SGER) from the Science and Technology Studies and Polar programs at the National Science Foundation. Svalbard served as the launching point in the 1920s for Norwegian dirigibles bound for the North Pole.

[43] Longyear's letters, photographs, and company records are deposited at the University Archives at Michigan Tech.

[44] See, for example, Thomas E. Leary and Elizabeth C. Sholes, "Fragments Shoed Against the Ruins: Industrial Archeology and Heritage Preservation," *Industrial Archeology* 26 no. 1 (2000): 96; Frank Harris, "From the Industrial Revolution to the Heritage Industry," *Geographical Magazine* 61, no. 5 (May 1989): 38-42; and Mike Wallace, *Mickey Mouse History and Other Essays on American Memory* (Philadelphia, PA: Temple University Press, 1996).

[45] David Lowenthal, *The Heritage Crusade and the Spoils of History*, 2nd edition (New York, NY: Cambridge University Press, 1998), xiii. See also idem, *The Past is a Foreign Country* (New York, NY: Cambridge University Press, 1985); Raoul Bianchi and Priscilla Boniface, "Editorial: the Politics of World Heritage," *International Journal of Heritage Studies* 8, no. 2 (2002): 79-80.

politics, business, and the media. He calls for stewardship that "tempers[s] the clamorous demands of the immediate present with a compelling rationale for the claims of both the past and the future."[46] Michigan Tech's doctoral program seeks to play a role in educating professionals who will be involved in work that crosses this divide between history and heritage. The program combines history and archaeology in ways that link sites, artefacts, and documents together. Just because heritage has been misused for short-term political or economic gain does not mean that the concept of heritage itself is invalid. The authors hope to impress upon future resource stewards the value of interdisciplinary approaches to history and heritage.

Recently, social scientists have borrowed concepts from the fields of ecology and landscape for their analytical utility. Such developments, argues industrial archaeologist Fred Quivik, are especially promising for industrial archaeology because they refocus attention on the big picture and away from isolated objects or phenomena. "We can now not only illuminate how machines worked or were made," he writes, "but also how workers interacted with each other or their bosses, for example, based on the patterns of buildings people developed to carry out those interactions."[47]

In the end, a focus on large projects, international cooperation, and the nature of heritage adds up to a new research agenda for scholarship on material culture that bridges the gap between the history of technology and industrial archaeology, all the while touching on architectural and environmental history, historic preservation, cultural anthropology, and other related fields.

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[46] David Lowenthal, "Pioneering Stewardship: New Challenges for CRM," CRM: The Journal of Heritage Stewardship 1, no. 1 (fall 2003): 11.

[47] Frederic L. Quivik, "Landscapes as Industrial Artifacts: Lessons from Environmental History," *Industrial Archeology* 26, no. 2 (2000): 56; see also Barrie Stuart Trinder, *The Making of the Industrial Landscape* (London, UK: Dent, 1982); John R. Stilgoe, *Metropolitan Corridor: Railroads and the American Scene* (New Haven, CT: Yale University Press, 1983); and John R. Stilgoe and Roderick Nash, *Perceptions of the Landscape and its Preservation* (Indianapolis: Indiana Historical Society, 1984).