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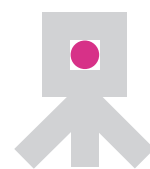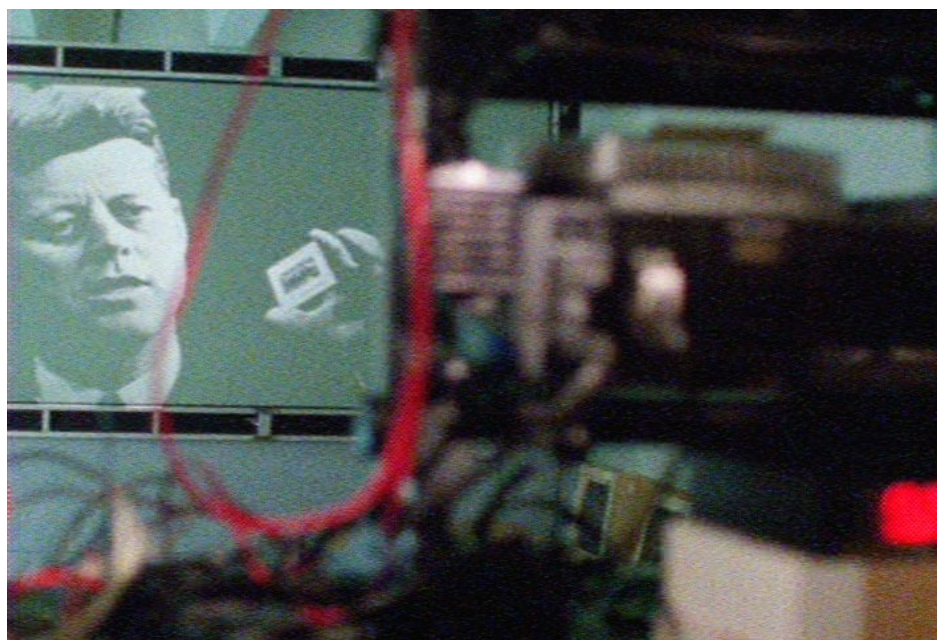
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Image after Image
Reconsidering the Fabric of Slide Shows

The Work of Ending:
Eastman Kodak's Carousel Slide Projector

Paige Sarlin　　　In my end is my beginning - T. S. Eliot[1]

Never New Again

On October 22, 2004, the last Eastman Kodak Carousel slide projector rolled off the assembly line in Rochester, New York. There was a crowd watching as four workers completed tasks in sequence, fastening together parts that had been manufactured in China. For this occasion, the projector's final assembly took a little longer than usual – the line was held up because some 35 people, ranging from the assemblers to middle management, wanted to sign the inside cover of the machine. As could be expected, digital cameras (both video and still) captured the occasion (fig.1). Vicky Christakis, one of the employees who had worked on the projector for over 20 years, planted a kiss on the machine before she rolled it over to her colleague for the final test. A small screen was pulled out across the width of the conveyor belt, the machine was plugged in and turned on. It projected three slides and was deemed suitable for retail. The worker picked up the machine and carried it over to another station for final packaging. Applause followed.

Three weeks later, there was a private Kodak event at the George Eastman House to commemorate the Carousel's significance for Kodak and the Rochester business community that it supported. Neither Vicky Christakis nor her colleagues attended the festivities. Instead, the room was replete with Kodak executives, managers, and dealers as well as small business owners and producers for whom slides were crucial.

Figure 1
'Last Day, Rochester, NY',
Video Still from Paige Sarlin,
The Last Slide Projector, 16mm and Digital Video
transferred to DVD, 2006.
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Strictly speaking, both of these scenes came many years after slide projectors became outmoded. Certainly not the point at which digital projectors began to replace Carousels, this chapter was seventeen years after Microsoft first shipped PowerPoint to customers.[2] But this milestone marked an endpoint in the slide projector's role in the narrative of technological progress – in the corporate existence of the Carousel as a mass-produced object. This episode also indicates the non-identity between technological development and corporate strategy. Not simply the result of shifting consumer patterns or the emergence of digital technology, the close-out represents the culmination of a whole host of shifts in the political economy that are less immediate or visible, but no less tangible or powerful. Such a phase-shift in the life of the Carousel needs to be understood in relation to broader trends within American manufacturing and global production.

1. T.S. Eliot, 'East Coker', in: *The Four Quartets*, San Diego: Harcourt Brace & Company 1988.

2. Robert Gaskins, *Sweating Bullets: Notes About Inventing PowerPoint,* San Francisco: Vinland Books 2012.

If obsolescence describes the state in which a technology is no longer sold or used, then the last day of production was just another point in the story of media technology – given that the second-hand market for the Carousel was still going strong and many galleries, museums, and schools still employed these machines in 2004 and continue to employ them in 2015. But this event marked the moment at which employees at Kodak stopped assembling these machines. So the question emerges: *what role does the last day of production play in our construction and understanding of obsolescence?*

Illuminating obsolescence

As a concept, obsolescence is central to the development of media history as a discipline, to narratives of technological progress and to counter-histories that seek to challenge these narratives. Beginning with Walter Benjamin's *The Arcades Project* written in the 1930s, critics have been envisioning the moment when a technology becomes outmoded as a moment to counter the fetish of the new and novelty that dominates corporate and popular accounts of technology.[3] For Benjamin, when a technology becomes outmoded it is released from the tyranny of the market: it becomes possible to imagine how things might have been, how a certain technology might have been used for emancipatory or even revolutionary purposes. The slide projector's decline into obsolescence lasted much longer than a single moment. No single event or dynamic shaped its trajectory; no single scene can be used to encapsulate the economic and cultural significance of its life-cycle. Instead, there is a string of events and turning points that need to be read in order to illuminate the work of ending: what so called "obsolescence" can mean for this particular machine and for the medium, the industries, and experiences it enabled; for the people who designed and supported it, and who made and transported it, who depended upon its continued production for their livelihoods.

A temporal marker, "obsolescence" indicates that an object has not moved in step with the progressive march of history. This designation refers to something that was once new but will never be new again; it designates that an object, mode of production, notion, or term has a past. Unlike new technologies, obsolete technologies have histories – they are subject to historical forces that extend beyond that of their inventors or developers. Their futures develop at different paces – subject to new timelines, they travel in less regularized circuits of exchange. They are divorced from the realm of production and manufacturing in more than the form of their appearance as commodities and objects of exchange. They are dead labor that is also orphaned. When viewed as inevitable or necessary, a designation of obsolescence naturalizes the rhythms of late capitalism and conflates consumption with production in

3. Walter Benjamin, *The Arcades Project*, Rolf Tiedemann (ed.), Howard Eiland and Kevin McLaughlin (trans.), Cambridge, MA: Belknap Press 2002. See 'Convolute N', 469-481.

ways that ignore important economic, political, and social realities. For this reason, it is important that we historicize the category and practice of obsolescence.

The corporate strategy of obsolescence emerges in the beginning of the 20th century. Alfred P. Sloan, then director of General Motors, introduced a plan to develop, market and produce a new model of car every year. This approach to manufacturing transformed the American automobile industry, as it was contrary to Henry Ford's business model. Having invented the assembly line, Ford believed the mass production of high quality machines would be most efficient if they kept producing the same model, minimizing change and avoiding the need for further investment in new machines for production or research and design. However, within a very short period after the implementation of their plan GM's bottom line increased and they surpassed Ford in sales. Eventually Ford followed suit and adopted Sloan's approach to manufacturing. Since then, planned obsolescence has become the central corporate strategy within the American auto industry. Many other technology-heavy industries worldwide have developed within the milieu in which this ethos was central to growth — and it has become the dominant modus vivendi for computer, phone, and camera manufacturing – moving even more quickly with the speed of changes brought about by digital innovation.

Emerging at the same time as Ford, Eastman Kodak subscribed to the Fordist approach to product development and manufacturing. Eastman Kodak prided itself on perfecting and maintaining existing hardware and film stock alongside the development of innovative new models. The company's historic investment in research worked side by side with its commitment to supporting and improving hardware and film stock that was meant to last. Building its reputation as an "imaging" company, the market for Kodak's products expanded beyond household consumption to professional arenas – from the film industry to medicine and business. The slide projector's history in this developmental diversification is archetypal, serving a pivotal role at different moments in the growth of the company.

Much that has been written about planned obsolescence focuses on the ways in which this profit driven strategy has consequences that permeate our society— acclimating consumers to the rampant production of waste, the pace of a market driven economy, and a culture of disposability.[4] And it is true that obsolescence has ensured that slide projectors have found their way to eBay, museums, galleries, and landfills the world over. But this essay suggests another approach to obsolescence that salvages the category and practice from being colored by an overemphasis on the consumption of new technology. To some extent, obsolescence has been seen heretofore as either a corporate designation or as a cultural or consumer

4. See Vance Packard, *The Wastemakers*, New York: Van Rees Press 1960; Jonathan Sterne, 'Out with the Trash: On the Future of New Media', in: Charles R. Acland (ed.), *Residual Media*, Minneapolis: University of Minnesota Press 2007, 16-31; and Lisa Parks. 'Falling Apart: Electronics Salvaging and the Global Media Economy', in: Charles R. Acland (ed.), *Residual Media*, Minneapolis: University of Minnesota Press 2007, 32-47.
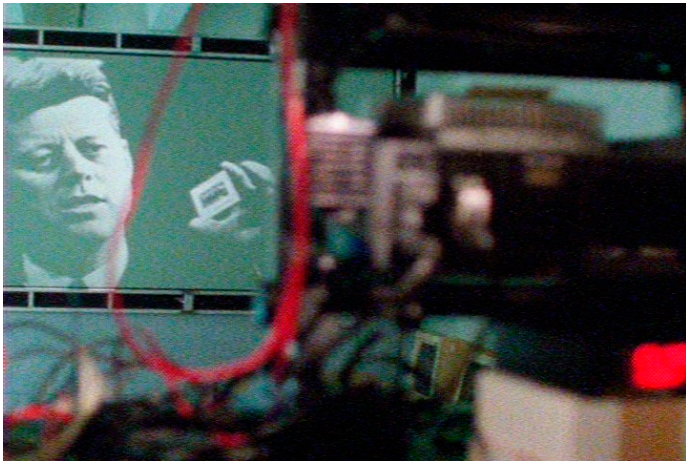
category. But obsolescence can also be a potential political designation when it is understood as overdetermined, a term used by both Sigmund Freud and Louis Althusser to indicate the ways in which multiple intertwining forces determine and shape a phenomenon.[5] From the perspective of overdetermination, the final assembly of a particular product allows structural dynamics to become legible in ways that foreground the organization of production and social relations by and through technology. To say that obsolescence is overdetermined is to recognize the dialectical nature of the processes shaping our social and cultural circumstances and defining the stories we tell about media technology and practices.

Figure 2
'Magic Lanterns, George Eastman House',
Video Still from Paige Sarlin,
The Last Slide Projector, 16mm and Digital Video
transferred to DVD, 2006. © Paige Sarlin.

A Machine with a history

The story of the slide projector actually begins in the 1600s with the invention of the magic lantern. The first apparatus organized a lens, a light source, and an image on glass in such a way as to reproduce a drawing in shadows on a wall (fig. 2). The discovery of this arrangement of parts enabled the creation of the medium of the slide show, whose history has been marked by remarkable versatility. Slide shows have been illuminated by candles, gas light, and electricity; they have been shown in parlor rooms, classrooms, auditoriums, church basements, and boardrooms; and they have projected millions of images that came to be called "slides" because of the way in which the initial glass plates were shuttled into view on a magic lantern. The medium of the slide show has outlasted the obsolescence of its technological support a number of times – most notably in 1895, when the magic lantern was declared outmoded and overshadowed by cinema, reduced to a mere light source for the new machines that projected moving images as opposed to still slides (fig. 3). The projector as a category of machine also played a significant role in the history of ideas, providing a figure and a model for ideology and critique.

Figure 3
'Cinematograph', Video Still from Paige Sarlin,
The Last Slide Projector, 16mm and Digital Video
transferred to DVD, 2006. © Paige Sarlin.

Eastman Kodak's entry into the storyline begins with the development of the Kodaslide projector in 1937.[6] Powered by electricity, this device could be loaded with only one slide at a time and relied on a "douser method" to lower each picture into place. Only two years later, Eastman Kodak released an improved version that utilized a side-to-side slide changing mechanism rather than the top-down design of the previous model. This year also

5. For Freud, overdetermination concerned the relation between conscious life and the unconscious as expressed in dreams. Althusser used overdetermination to characterize historical change as a form of rupture or break that derived from the relation between economic and ideological forces. See Sigmund Freud, *The Interpretation of Dreams*, James Strachey (trans.), New York: Basic Books 2010, 295- 325; Louis Althusser, 'Contradiction and Overdetermination', in: *For Marx*, Ben Brewster (trans.), New York: Verso Books 1996, 87-128.

6. Merri-Lou McKeever, 'A Brief History of Slide Projectors', 2004 ‹http://www.kodak.com/eknec/documents/a6/0900688a807890a6/history.pdf› (12.07.15).

Figure 4
'Carousel', Video Still from Paige Sarlin,
The Last Slide Projector, 16mm and Digital Video
transferred to DVD, 2006. © Paige Sarlin.

saw the introduction of the first Kodachrome transparencies fitted with Kodaslide Readymounts – designed especially for this machine. Kodak had already introduced the two by two inch design with the first Kodaslide machine, but the creation of Readymounts established a standard format for all slide film and projectors going forward. This sort of proprietary scheme was characteristic of George Eastman's approach to product development; he consistently sought to dominate the market by providing cameras, film and the means to develop photographs. In this case, the simultaneous introduction of Kodaslide Readymounts with the new projector ensured the sale of Kodak's new hardware and launched what was to be the primary platform for the circulation and amateur consumption of color photographs until the advent of cheap color prints in the late 1970s (introduced by Eastman Kodak as well).

The introduction of the Carousel projector in 1961 was a moment of resurgence (fig. 4). The Carousel's round tray was a vast improvement over other straight tray models on the market, and this innovation made possible a dramatic increase in use that coincided with and contributed to a whole range of economic transformations. The most successful piece of hardware ever made by Eastman Kodak, over 19 million of these vehicles for projection were made during 40 years of continuous production.[7] The machine was a shining example of low-cost mass production and it helped to reconfirm Kodak as a model American company grounded in Ford's paradigmatic approach to manufacturing. Focused on improving existing models, Kodak's investment in scientific research and development is legendary, and the Carousel was a result of this commitment to quality and innovation.

Situated at the nexus of changing modes of production, the Carousel's emergence coincides with the general post-war production boom. This machine was a peerless vehicle for the projection of images whose myriad uses and popularity far exceeded Kodak's own expectations. More than simply a tool for amateur photography and education, the Carousel became a central instrument for the development of corporate culture. In response to increasing demand, the first professional non-consumer round-tray design, the Kodak Ektagraphic slide projector, was released in 1967. By 1979, the slide show was the most ubiquitous medium for corporate and educational communications, serving primarily as a tool for business to represent itself to itself and to other constituencies.[8] Production of Carousel slide projectors

7. Information concerning the history of the audiovisual industry and Carousel projector production was compiled from interviews with Tom Hope, publisher of *Hope Reports*, the leading industry report on Slide Projector and AV industry sales from 1962 until 2004, and Merri-Lou McKeever, Manager of the Presentation Group at Eastman Kodak from 1994 to 2004.

8. Thomas W. Hope, 'Large Screen Presentation Systems', *Hope Reports*, Rochester 2000.

Figure 5
'Elmgrove', Video Still from Paige Sarlin, *The Last Slide Projector*, 16mm and Digital Video transferred to DVD, 2006. © Paige Sarlin.

for European consumers began in Stuttgart in 1964 and these machines were developed alongside the American models, ensuring Kodak's dominance of the global market. This rise in use coincided with the crisis of over-production that plagued the American economy of the seventies. Kodak continued to invest heavily in research and development for its booming slide business, introducing significant improvements to existing models until the first major redesign in 1981. But the twin recessions of 1981 and 1983 hit the company hard and the slide projector department in Rochester suffered layoffs despite the fact that Carousel slide projectors were in constant use in offices, schools, theatres, and conference centers.

The total gross revenues of this industry of producers, photographers, labs and technicians rivaled the movie business throughout the early eighties.[9] The slide projector was both a product of the old manufacturing economy and a tool for the "new" information economy. Following trends in manufacturing across the United States, there was a marked increase in worker productivity despite the decline in the number of workers employed in producing the machines. Housed in the huge Elmgrove plant in Rochester, hundreds of workers continued to meet increasing demand through the 1980s into the 1990s, and the slide projector remained profitable even as other aspects of Kodak's business were weakening. In fact, the machine was transferred between different groups during periodic corporate reorganizations in order to maintain the bottom line of failing sectors of the company. Other product lines were gradually outsourced and workers laid off, but the slide projector production and assembly remained in the Elmgrove facility (fig. 5). Different aspects of projector manufacturing slowly began to be moved off site to local manufacturers. It was not until 2001 that the production of projector parts was outsourced to China, which coincided with Kodak's sale of Elmgrove. Only eight of the dozens of workers from the assembly line were transferred to Building 205 in Rochester (fig. 6). They continued the final assembly of these mechanical projectors as the digital revolution swirled all around them. In Stuttgart, Germany, the assembly line had been fully mechanized for many years; by 2004, there were only two workers cranking out thousands of machines in one corner of a large factory.

The beginning of the end

Near the end of 2003, in the midst of the many discussions of the shift from analog to digital, a group of managers at Eastman Kodak sent out a letter to all Kodak dealers and various slide

9. Thomas W. Hope, 'Presentation Slides V: Electronic and Film - Update', *Hope Reports,* Rochester, October 1999, 7.

Figure 6
'Building 205', Video Still from Paige Sarlin,
The Last Slide Projector, 16mm and Digital Video
transferred to DVD, 2006. © Paige Sarlin.

related professionals. The letter announced that projector production was going to end by spring of the next year. But this was not like the ordinary corporate announcements that herald the introduction of new products and the retiring of old ones. This letter was unique. An official statement was issued in September that read something like this:

Eastman Kodak Company will discontinue the manufacture and sale of 35mm slide projectors by June of 2004. The company will continue to provide service and support for slide projectors through June 2011.

While those are indeed the facts, those of us who have been intimately involved in the slide projector business for some time have stronger feelings about it. To us, it has had a personality all its own; some would call it indomitable. The character traits of the slide projector industry are comprised of the numerous good qualities of the people who have been our partners for many years – people like you. For such a large, competitive, and, at one time, booming business as this has been who would have guessed that so much camaraderie would have developed? But, it did. We not only shared the birth, growth and maturity of a business, we shared friendship. Brought together professionally we connected in personal ways too.

With that in mind, we who are left to close Kodak's slide projector business offer you our heart-felt gratitude for the personal and professional relationships that have been forged. We greatly appreciate your support for Kodak and its products over the years, and we look forward to your

continued cooperation as the trusted slide projector retires. The projector's last day "on the job" here at Kodak will be March 31, 2004. That's when final production orders must be in to the factory ... It has been an honor and a pleasure working with you.

Figure 7
'Sunset Party, Germany, 2004',Video Still from
Paige Sarlin, *The Last Slide Projector*, 16mm and
Digital Video transferred to DVD, 2006.
© Paige Sarlin.

Sincerely,

Merri-Lou McKeever, Ginger Hunneyman, Joe Paglia, James Auburn, and John Beerse[10]

This document makes clear that the end of projector production was not simply about the paradigm shift from analog to digital or the transformation of a technology for sharing and projecting images. The human consequences of obsolescence are myriad and this was a milestone in the work lives of many people.

First and second tier management addressed this letter to people who sold, repaired, and used the slide projector. Framing this letter as a thank you, these employees distinguished themselves from the corporate line and acknowledged the social bonds that they had built over years of working with the slide projector and beside each other. By drawing an analogy between the story of the machine and the industry it enabled, this letter called attention to a shift in corporate practices and culture that runs parallel to changes in technology. A touchstone for connection and attachment, the Carousel was a foundation for a production line that represented an approach to manufacturing and business that had become anachronistic itself. Kodak slide projectors were built to last and in order to develop products at that level, there needed to be longevity amongst the engineers, technicians, and sales team; there had to be a willingness to build relationships with dealers and customers, and to foster trust and confidence in the product within the company as well as on the market (fig. 7). But from the 1990s onwards that sort of "camaraderie" dissipated across all arenas of manufacturing. Kodak's extended investment in its workers and research supported the image of Kodak as a corporate family and helped to keep unions out of the Rochester factories. But this strategy had become outmoded. The Carousel had persisted past any predictions, having resisted outsourcing and various other forms of restructuring that other manufacturing entities had weathered throughout the 1990s. Even the last day of production had to be extended past the date that this letter announced because of the volume of demand. Clearly not an end to the slide show as a medium, this moment was the marker of something else that was deeply felt – a transformation at the level of the social, between people.

10. James Auburn, John Beerse, Ginger Hunneyman, Merri-Lou McKeever, and Joe Paglia, 'Letter to Kodak Dealers', Rochester: Eastman Kodak November 2003.

Figure 8
'Rest in Peace Slide Projector',
Video Still from Paige Sarlin,
The Last Slide Projector, 16mm and Digital Video
transferred to DVD, 2006. © Paige Sarlin.

Two months after the slide projector group sent out their letter, Kodak announced their decision to focus entirely on digital technology, and with that shift they would need to cut at least 10,000 jobs before the end of 2004.[11] This was a huge blow, and it was the first of a wave of layoffs and restructurings that culminated in Kodak filing for bankruptcy in January 2012.[12] There had been waves of layoffs before, but this reorientation was decisive. The stronger feelings of the projector group were echoed and amplified throughout Rochester.

A thoroughly modern category, obsolescence is neither ideologically neutral nor objective (fig. 8). Obsolescence is planned by corporations; it is shaped by technological developers; it is accepted by consumers as an aspect of cultural life under capitalism; it is embraced by artists and collectors; and it is used by scholars to explain the role of media in our lives. Obsolescence is a concept and category, a practice and a designation that derives from material conditions and which impacts many different strains of social and economic relations that extend beyond that of consumption or imagination. Critics are most keen to point out that obsolescence is created, a result of market and technological forces. But the playing out of obsolescence from the perspective of manufacturing is an uneven process; it occurs at various paces in assorted places, affecting people in a range of different ways.

For Walter Benjamin, obsolescence allows for a moment in which we can *imagine* a technology freed from the circuits of exchange. But machines like the Carousel do not cease to be commodities after they stop being made new. Just because we can imagine what different *uses* a machine can be put to doesn't mean that it is entirely free from the circulation of objects – market and commodity fetishism. If anything, since Benjamin we can see that the fixation on old media has generated an industry in the realm of art and media studies. The retrograde has emerged as a category in the framework of overproduction, an answer to the pervasive anxiety about change in the atmosphere of neoliberal capitalism.[13] At the end of slide projector production, we can recognize the work of ending – the players and processes engaged in the reorganization of labor and technology that the Carousel both enabled and epitomized (fig. 9). At this moment, it becomes possible to reconsider the conditions under which media hardware and software are manufactured. Seen dialectically, these moments invite us to imagine how the social relations of production might have been organized and might yet be organized.

11. Ben Rand, 'Worldwide Kodak Layoffs', *Democrat and Chronicle – Rochester, N.Y.*, January 23, 2004.

12. Steve Sink, 'Kodak Files Chapter 11 Bankruptcy', *Democrat and Chronicle – Rochester, N.Y.*, January 19, 2012.
13. Christian Thorne, 'The Revolutionary Energy of the Outmoded', *October*, vol. 104, Spring 2003, 97-114.

Figure 9
'Kodak Factory, Muhlhausen Germany',
Video Still from Paige Sarlin,
The Last Slide Projector, 16mm and Digital Video
transferred to DVD, 2006. © Paige Sarlin.

Media technologies are both vehicles of the future and the product and inheritors of the past. Situated in this way, they are machines that both help us to remember and to imagine. These machines offer models for the construction of histories and narratives, of society and technology itself. The story of the Carousel should not be reduced to tales of its domestic or art historical use, to dramatizations of its role in what Deborah Tudor calls "the selling of nostalgia."[14] This piece of hardware animated other circuits of exchange and value creation over the course of its manufacture. The Carousel was implicated in a historically specific process of outsourcing and the introduction of longer supply chains and more complex logistics. But it was also crucial in the establishment of social relations, of friendships and alliances, of face-to-face contact built on the assembly line as much as in the boardroom or classroom.

14. Deborah Tudor, 'Selling Nostalgia: Mad Men, Postmodernism and Neoliberalism', *Society*, vol. 49, no. 4, 2012, 333-338.