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The Taphonomy of Disaster and the (Re)Formation of New Orleans

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Source: *American Anthropologist*, New Series, Vol. 108, No. 4 (Dec., 2006), pp. 719-730

Published by: Wiley on behalf of the American Anthropological Association

Stable URL: <http://www.jstor.org/stable/4496514>

Accessed: 28-01-2017 16:34 UTC

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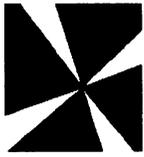
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The Taphonomy of Disaster and the (Re)Formation of New Orleans

ABSTRACT Using observations from recent participation in post-Katrina recovery efforts in New Orleans, I make the case in this article that taphonomic processes such as trash removal, deposition, earthmoving, and demolition are a primary medium through which individuals and communities reconstitute themselves following a disaster. Taphonomy, or the formation of the archaeological record, does not simply reflect social processes, it is a social process. The taphonomic processes currently underway through the clean-up and rebuilding efforts in New Orleans dramatically illustrate this point. I recommend that both ethnographers and archaeologists undertake a fine-grained ethnoarchaeology of disaster. I engage with the literature of disaster to illustrate the potentials I see for this type of study, particularly as it pertains to the culture–nature nexus, perceptions of vulnerability, and the revelatory power of disasters.

Taphonomy (tə-’fä-nə-mE. Function: noun. Etymology: Greek taphE burial + English -nomy: lit., the laws of burial. “A subdiscipline of archaeology devoted to the investigation of the formative and disturbance processes affecting the archaeological record . . . [s]uch processes encompass all the events intervening between the time of initial deposition and the time of recovery of remains by the archaeologist or paleontologist.”

—Mignon 1993¹

TAPHONOMY HAS LONG BEEN ONE of my favorite words in archaeology—in part because it has a lovely precision that defies translation and in part because I have always thought it contained the potential for expanding beyond archaeology and colonizing other disciplines. There is a dormant vitality and metaphoric usefulness about it. During my recent experience working in New Orleans for three months in the wake of Hurricane Katrina as a participant-observer in the recovery process, *taphonomy* was often on my mind. Perhaps by explaining why and how, its potential can be awakened by catastrophe.

Taphonomy is the process through which the archaeological record is created. It describes those processes, intentional and unintentional, human and natural, large scale and nano scale, that go into the creation and distillation of the archaeological record. It includes the cultural logic that dictates what is to be recycled, what is to be discarded, and how. It encompasses the activities of microbes, worms, and rats; the erosion of wind and water; the micromovement

of sediments; the effects of minerals and acidity; the intrusion of tree roots; the activities of later human generations (tomb raiding, cesspit digging, etc.); and the physics of how a building becomes a ruin. All these processes are taphonomy (there exists an abundant literature on the taphonomic interpretation of archaeological deposits, e.g., Denys 2002; Schiffer 1987; Waters and Kuehn 1996). The record it produces is something that is both fragmentary and relatively permanent, although never static. Taphonomy produces a slow-moving stratigraphic structure. It enables and constrains what we can interpret about past human behavior.

Taphonomy is a useful frame for approaching the conjuncture of events and structures in the making of culture. I think of it as an underutilized device that can help reveal the temporal, spatial, and (esp.) material dimensions of many phenomena that have been the foci of historical anthropology (e.g., Comaroff and Comaroff 1992; Price 1983; Sahlins 1985, 2004; Trouillot 1995). Michel Foucault, in the *Archaeology of Knowledge* (1972), never stumbled on taphonomy in his play with the archaeological metaphor. However, it is what he meant when he described the formation processes of archives and of intellectual history. Taphonomy describes the complexity, the mix of accident and manipulation, the silences and erasures, the constraining structures, and the sudden ruptures that all go into the creation of history and into the formation of the “ethnographic present.” I will ground this expansion of taphonomy into epistemology and anthropology-at-large with scenes from New Orleans in the autumn of 2005. Although my examples

all bear on the processes (past, present, and future) that go into the creation of New Orleans's archaeological record, I hope my real-time description will make it a little clearer how inseparable these are from the political, economic, and ecological—even the emotional—processes that go into the creation of society.

Although the literature on the anthropology of disaster (to be discussed below) readily admits the ability of catastrophic events to dramatically reveal the relations between a community and its environment, the focus tends to be on the major event of the disaster itself (hurricane, earthquake, drought, etc.) and policy reaction, rather than on the day-to-day microprocesses through which individuals, households, and neighborhoods define *recovery* by moving around debris, burying past living surfaces, and rearranging the landscape. Time and again I was struck in New Orleans with how fundamentally archaeological the recovery process is: It is a special period during which people are highly attuned to the sorting and deposition of artifacts, the demolition of structures, the redesign of cities, and the movement of dirt itself. Perhaps under no other conditions are the relations between people and their landscape quite so self-conscious or quite so active. Disaster recovery represents a special session for a major rewriting of the “laws of burial.” And these laws—no matter the scale, from major urban rezoning plans to the decision that one family makes about what to do with the corpse of a drowned pet—entail and express nearly every register of social life, from the spiritual to the political, the economic, the ecological, and the emotional.

The active creation of a new archaeological record during recovery from disaster, I argue, is a primary medium through which individuals and communities reconstitute themselves. Thus, it pays to pay attention to the major and minor decisions people make regarding debris and dirt. Stratigraphy in this case does not merely reflect other, more socially significant, behaviors removed by one or two degrees from the record left in the earth but, rather, burial itself is a deliberate part of the recovery effort. Struggles over how to sort trash, where and how to deposit it, what to do with the dead, where to rebuild, how to memorialize the event in space, and, quite literally, the movement of dirt (for levee building, mudslide and earthquake stabilization, fire gaps, etc.) all factor into social transformation and cultural preservation.

The general point I want to make about the special role that trash and dirt play in disaster recovery carries implications for both archaeologists and ethnographers. Cultural anthropologists could benefit from approaching disasters and their aftermath more taphonomically. We have a great deal to learn from watching the intense micro and macro processes that redefine a community's material life after a major rupture.

I also want to urge archaeologists to account for less-obvious taphonomic processes, such as emotions and spiritual considerations, as well as to admit the great degree of contingency that dictates the laws of burial. In fact, call-

ing the forces we are speaking about “laws” is misleading—unless we allow that those laws are as arcane as the laws of quantum physics or as frequently violated as laws against vice. The resulting stratigraphy is less a code to be broken than an artwork to be interpreted: Certainly tradition, materials, environment, and technique factor in, but so can idiosyncrasy, anger, and freakish accident.

My third suggestion speaks to both sociocultural anthropologists and archaeologists and, in fact, tries to get them to speak to one another. Archaeologists have long studied disasters in human history (Pompeii, Southwestern Pueblo drought, Pleistocene die out, etc.) but have rarely done so with more than a passing reference to contemporary experiences of disaster. However, anthropologists studying disaster rarely provide deep historical context and, in fact, have a tendency to characterize our present era of global warming, gonzo chemistry, and population overload as exceptional. There are things to learn from trading places.

Archaeologists have a tendency to view disasters in terms of punctuated equilibrium. Thus, disasters for them are extraordinary events representing the end of a culture or the beginning of a new one. They are often connected in the literature to a dead end in social evolution—or a “collapse.” This sort of view skews other possible readings of the archaeology of disaster and causes us to miss a vivid opportunity to understand past societies. We should not be too distracted, archaeologically or ethnographically, by the otherworldly and apocalyptic scenes disasters temporarily create. Although exceptions to the everyday rhythm of life, their importance lies in their ability to shake the taken-for-granted cultural layers loose, revealing structures, both fragile and enduring, that lie below. Thus, although disasters have usually been studied for their subsequent effects on societies (“collapse,” migration, political reordering, ecological readaptation, etc.), I am suggesting here that they need to be more carefully studied retrospectively—that is, for what they reveal about the society that existed prior to the catastrophic event. This is an aspect of disaster research that many ethnographers have recognized and utilized in interesting ways. However, ethnographers with long-standing ties to affected communities may have a tendency to wishfully perceive continuity and survival where in fact upheaval and cultural extinction are real possibilities—possibilities attested to in the archaeological record.

In the sections that follow, I will make my case for the special importance of taphonomic processes, both literal and metaphorical, in contexts of disaster recovery using my recent experiences in New Orleans. I will then flesh out the broader research implications through an engagement with the anthropological and archaeological literatures on disaster.

TAPHONOMY OF POST-KATRINA NEW ORLEANS

In early September of 2005, I received a call from Tom Eubanks, the Louisiana State Archaeologist. He was calling

to see if I could help his office begin to deal with the effects of Hurricane Katrina on the historical and archaeological resources of the New Orleans region by serving as a liaison between his office and Federal Emergency Management Agency (FEMA). At the time, rescuers were still picking people up from attics and rooftops. Yet plans were already being floated about how the damaged portions of the city were to be demolished and rebuilt. Engineers, planners, and architects from around the world weighed in on the matter, whether or not they had firsthand experience with southeastern Louisiana.

One idea adopted early on by FEMA officials was to practice “waste in place,” in which damaged buildings would be squashed on their lots and buried with clean fill. The resulting mounds would elevate the ground surface and provide a foundation for new construction. This plan had the additional advantage of addressing the problem of the Formosan termite, a voracious invader that has infested the architectural skeleton of New Orleans. Federal guidelines prohibit the recycling and export of building materials outside the affected area to try to limit the spread of this pest. Thus, the waste of New Orleans must be kept close to home.

Before I even left Chicago, I had begun to realize that my role as a liaison between the State Division of Archaeology and FEMA’s Historic Preservation and Environmental Section was to put me in a peculiar, but intriguing, position as an archaeologist. I was to help write how the material remains of New Orleans were going to be deposited. I would be intentionally writing my own laws of burial, with results not only on my own future research in the area but also with significant effects for generations of archaeologists in the future who might want to investigate this society partially collapsed by a disaster. Histrionic comparisons to Pompeii were rapidly and irresponsibly made in the media (Berry 2005; Vale 2005; Williams 2006). However, there is no denying that certain individual households, and quite likely whole neighborhoods, were going to be buried or erased, frozen in archaeological time by the blueprints of bulldozers and I was to have a hand in writing those blueprints.

The awesome responsibility of this struck me but also the oddity of it. Taphonomic analysis usually involves the unraveling of mysterious and anonymous processes. Here I was planning (through dry, bureaucratic “memoranda of agreement”) how the archaeological record was to be formed. It seemed to me that the archaeological record was rarely so intentionally designed. But it also made me begin to question my assumptions about the relatively unconscious nature of cultural transformations on the archaeological record, or “c-transforms” as Michael Schiffer (1987) once aseptically termed them. Were there analogies to be made in the past? Technical, scholarly, perhaps sacred, considerations about how the remains of disasters were to be treated? Given the social and political crises as well as intensified emotional forces that accompany a major disaster, does the deposition of demolition waste take on a heightened significance for a community? Might it be a moment in which new laws of burial are enacted?

When I arrived at the local FEMA Area Field Office in a suburb of New Orleans, my archaeological interests and my responsibilities as an urban planner came into conflict. “Waste in place” is a perfect solution from the perspective of archaeological research, because it means that every heavily damaged household, school, or store would be demolished and buried, with all its abandoned contents, in situ—left exactly where they once stood. In the future, the association of artifacts found there would be securely tied to recorded owners and activities. However, I also knew through my prior taphonomic education on New Orleans sites, that the “waste in place” plan was not well informed by local geology. Although it might work for unimproved parklands or open space, the plan would provide a foolhardy platform for new building. Because the soils in southeastern Louisiana are young (most of the land surface is less than 1,500 years old, and some spots are as young as 200 years old), geologically they are still in the process of settling—like mud that has been kicked up in a pond. As they settle, the soils compact and subside, causing the land surface to sink. As with any other material, if you add additional weight to it, it will sink faster. Thus, the well-intentioned plan to fill the low-lying areas of New Orleans with waste from the hurricane would accelerate subsidence and wreck havoc with any new buildings constructed on the fill. Within ten years, one would begin to see cracked foundations and sinking houses.

In mid October, the “waste in place” plan was still being advocated, but it was now under the new name “on-site disposal.” FEMA personnel had become quite worried about the anger directed at them by local victims of the hurricane. The renaming of the plan was an attempt to anticipate and manage any further public relations flare-ups. Some professionals expressed concern that local residents would object to terminology that described the material remains of their pre-Katrina lives as “waste.” This was particularly sensitive because some of the politically prominent neighborhoods likely to be targeted were majority African American, majority poor, and mightily pissed off.

Meanwhile, local engineers and geologists were sending out the alarm about the quixotic nature of the plan to rebuild sections of the city through in-filling. In addition, environmentalists had begun to point out that burying, rather than removing, houses and their goods would result in uncontrolled soil contamination from refrigerators, air conditioners, and household chemicals. Together, these factors soon convinced FEMA and the city to abandon any massive “on-site disposal” (or “waste in place”) plans.

Over the course of the autumn what I ended up drafting instead was a document that outlined how to demolish a house and remove its remains and contents with minimum ground-surface disturbance. Thus, much of the archaeological record dating to the late 20th to early 21st century in hard-hit neighborhoods will be erased from individual house lots, although earlier strata below them will be preserved. The recent material will be deposited in a reopened landfill within the city limits. At this writing, that mound

has already become the most significant topographic feature in the metro area. My wish to keep the archaeological record close to its source was granted, but the scale of the site matches the scale of the catastrophe. The Gentilly Landfill represents the city as a whole as it existed on August 29, 2005.

The archaeological record of Hurricane Katrina is being formed not only by significant ecological forces and human efforts to control them but also by emotional forces. At the macro level, the antifederal anger and the reactionary fear of officials went into the decision to abandon the "waste in place" plan. On the micro level, I can tell you that each dump-truck load that arrives at the landfill from one of the neighborhoods of New Orleans is filled with the emotional taphonomy of individuals and families impacted by the storm—their personal histories and complex reactions to trauma reflected in acts of discard and preservation. As I helped friends move the soggy, moldy contents of their homes to curbside piles, we stopped to laugh, cry, and swear. Some made hasty decisions, dumping without looking, pushing to get through the liminal period of recovery and trying not to look back. Others lingered, sorted, and clung—attempting to salvage mementos of a normal life, from shriveled dancing shoes to preserved diaper wipes. I can attest, through this unintended ethnoarchaeology, that these differential emotional reactions to loss and upheaval will have significant impacts on the statistical variability of the archaeological record.

I am now looking back on my previous archaeological investigations, searching for analogies and attempting to read emotional states, such as that reflected in the trash pit from a 1788 fire that 200 years earlier devastated New Orleans (Dawdy 1998, 2000). Now I think I recognize a particular posttraumatic reaction in the nearly whole pots and barely damaged clothes and goods thrown rapidly into the pit. The inhabitants of the site known as Madame John's Legacy responded to the fire with an anxious and assertive step into the future. Within days of the catastrophe, they had cleaned out and gutted their home and signed a new building contract for a building that could have been a twin of the one they lost. Sarah Tarlow (2000) has exhorted archaeologists to account for the emotional dimension of human experience, although this effort is bound to be fraught with methodological debate. Although we may not be able to comfortably predict the precise cultural emotions associated with disasters, it seems a safe cross-cultural assumption that disasters define a period of heightened, and therefore perhaps more archaeologically visible, emotional responses worthy of interpretive attempts.

Politics, of course, also goes into the taphonomic mix. Not only do the landfills represent a compromise between national sovereignty and local desires, but the entire rebuilding process—the new master plan for New Orleans—is as political as any process can be, and as material in its effects on the landscape as any process can be. It is too early to predict the outcome, but for the present one effect has been to freeze a political hotspot in the city. Much

of the Lower Ninth Ward, a majority black neighborhood with high homeownership rates, was dramatically washed away when an anemic federal floodwall along the Industrial Canal failed. Since the early 20th century, this neglected working-class neighborhood has been vocal and organized in its demand for city services. Since the 1960s, when white flight segregated the neighborhood, it has been the epicenter of African American protest against economic and environmental injustice. That tradition was tragically reinvigorated with the events of the post-Katrina levee failures. FEMA and city officials have concentrated their political caution on this neighborhood. It was the last neighborhood to be opened to residents. Only some four months after the storm did they finally gain entry to look at their homes and attempt to salvage artifacts. It was also the last neighborhood to begin receiving demolition permits. With FEMA paying the demolition bills and the disgraced U.S. Army Corps of Engineers overseeing the logistics, a demolition plan for the Lower 9 (as locals call it) had to await a clearer political plan. That has been slow in coming, although in March 2006 demolition began on those houses washed into in the public rights-of-way.

Political sensitivities mean that the archaeological record of the Lower 9 will be significantly different from that of other neighborhoods. Left exposed to the elements for months longer, chances are that more scattered belongings and shattered architectural features will remain on site. Exposed to the follow-up of Hurricane Rita and periodic rains and freezes, these artifacts have already begun the taphonomic process of sinking in and becoming part of the local stratigraphy. Undoubtedly, the archaeological signature of Hurricane Katrina and the levee breaks will be visible in excavation profiles of the future. Quite likely, archaeologists will find fragments of human bone, perhaps whole skeletons, in this part of the city.

The decision to go slowly in the Lower 9—to hesitate with the processes that aim to restore normalcy—is also in some sense a spiritual decision, out of respect for the dead and their affected families. Death arrived differently in the Lower 9, owing to the tsunami-like force of the water from three explosive breaches. People were crushed, drowned, or washed away without warning. Their bodies were churned into great piles of debris and upturned mud. Thus, the recovery of human remains there has been a slow and painstaking process. In April 2006, more than six months after the storm, someone's mother was found under a pile of debris (Dewan 2006). Logistically, the long, slow, and incomplete recovery of human remains demands the delay of demolition and restoration work. Emotionally, the neighborhood is being preserved as a memorial, representing the sense of loss and injustice the city as a whole feels. No one quite knows what to do with it. The future of the Lower 9 was at the center of the 2006 mayor's race. How the candidates proposed to deal with the landscape of this part of the city—with its spiritual potency, political volatility, and environmental fragility—stood as a litmus test (Corley 2006). The candidates had to demonstrate an appropriate

respect for the past and an acceptable vision of the future. These gestures inevitably entail a plan for disposing of the city's remains. That is taphonomy.

Now the dump trucks have started to arrive in the Lower 9. If you were to stand on the broken levee of the Industrial Canal and look to the northwest, you would be able to see their destination, a startling new interruption of a previously flat horizon. The Gentilly Landfill (also called the Agriculture Street Landfill) outsizes the grandest of the prehistoric mound complexes in the Lower Mississippi River Valley and was designed with no less attention to political dynamics, the forces of nature, and respect for the dead. It hunches there, steaming and inwardly churning with microorganisms, settling into an archaeological record for future generations.

COMPARING DISASTERS

In an overview of disaster theory, Anthony Oliver-Smith (2002) describes three common themes that I think could be harnessed in a taphonomic approach: (1) the nature-culture nexus, (2) vulnerability, and (3) the revelatory power of disasters.

"Disasters occur at the intersection of nature and culture and illustrate, often dramatically, the mutuality of each in the constitution of the other" (Oliver-Smith 2002:24–25). Hurricane Katrina (by which I mean to encompass all the natural and cultural events that constitute the perceived disaster) revealed the extent to which the "natural" landscape of southeast Louisiana has been humanly engineered. Although locals knew that the hundreds of miles of levees and canals built by the U.S. Army Corps of Engineers to shunt the Mississippi and navigate the shipping and oil extraction routes of the local economy were a part of their built environment, they also perceived these linear earthen features as the boundaries between culture and nature, between city and swamp. The levees provided not only a false sense of security but also a false sense of civilization and separation from nature. The ways in which the levee system created an imagined geography on which such a fundamental duality was inscribed helps explain why a 100-year hurricane and flood, which meteorological models predicted, was so unimaginable to reluctant evacuees. If you had polled residents before Hurricane Katrina, I think you would have found widespread cynicism about the competency of the U.S. Army Corps of Engineers and, especially, the local levee boards. Thus, the engineering failure of any particular levee was in its specific terms not all that unexpected. I would aver it was not so much faith in the physical integrity of the levees that kept some people behind, but faith in the more fundamental, cosmological structure that they represented—the nature-culture divide. It was simply unthinkable that the city, particularly a city with a strong sense of its own endurance and historical integrity, could be so instantly transformed into a watery wilderness.

Whereas I believe Oliver-Smith (2002:42) is right to emphasize the need for analysis to focus on the mutual con-

struction of nature and culture, this perspective is at an etic level useful for social criticism and policy shaping. At an ethnographic and emic level, we still need to pay attention to the ways in which disaster and recovery reveal the specific local logic of culture-nature relations. For example, one of the most frequent topics of conversation in post-Katrina (or post-K, as locals call it) New Orleans is mold—its smell, its aesthetics, its health effects, and, of course, methods for its removal. One of FEMA's missions within its public assistance program has been to help institutions and residents mitigate mold, an environmental threat that has risen on the list of government concerns in the wake of several national lawsuits tracing mold-related illnesses. However, the concern with the mold-culture divide exists mainly in the courts and in the machinery of industrial hygienists. To paraphrase what many New Orleanians expressed to me: "Do these FEMA people have any idea how high the mold count was BEFORE the storm?"

Mold is a source of local humor rather than widespread panic. Most of the residents I know soon abandoned the recommended ventilation masks when cleaning out their houses. They had long ago made peace with mold and accepted it into their household ecology in a climate where the humidity sits above 80 percent nearly year round. However, the invasion and proliferation of other natural species because of the levee breaks was of greater concern. Several residents reported to me their horror on finding snakes (or, more often, rumors of neighbors finding snakes—particularly the poisonous and territorial water moccasin), swimming through houses. These stories nearly always located the snakes in the kitchen, which seemed to represent the most repulsive violation of the nature-culture divide. Reports on blogs in the early days after the storm also reported alligators swimming through the city. The reverse flow also occurred. In New Orleans, as in other disasters (Hoffman 2002:124), one of the indications of an inverted and disturbed order is the reversion of domestic pets to a feral state.

Clearly, the rapid repair of levees after Hurricanes Katrina and Rita is a safety concern, so it would be absurd to suggest that their replacement is motivated solely by cosmological discomfort. However, it should be noted that Mayor Nagin early on insisted on the importance of restoring the levees rapidly to make New Orleanians comfortable coming back to the city—even though he did not necessarily plan on resettling them in the same heavily flooded neighborhoods that those levees protected. In other words, the psychological effect of repaired levees seemed more significant than their practical effect. Another indication of the culture-nature anxiety precipitated by the hurricane is evident in local reactions to one popular suggestion from national planners to replace the hardest-hit neighborhoods lying at low elevations with wildlife preserves and parklands. Although eminently practical in terms of creating protection against another hurricane (the additional wetlands would help absorb water and create a buffer to winds), the response from New Orleanians I have talked to

has ranged from lukewarm to outraged. Nor does this appear to be simply a matter of “not in my back yard.” Few seem willing to concede that nature has won part of the battle, nor are they willing to redraw the map to allow for a greater interdependence between city and swamp. However wise and optimally adaptive this would be, it is not yet thinkable. In fact, to many residents it seems to represent capitulation rather than recovery.

One of the terms commonly used by anthropologists of disaster is “vulnerability.” It is an interesting choice of words in that it anticipates a delicate imbalance; it empowers the observer to retrospectively predict disaster. Vulnerability means the “characteristics of a person or group in terms of their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard” (Blaikie et al. 1994:9). Disaster theorists who emphasize vulnerability also stress the social factors that create them. Along with the natural and physical vulnerabilities (e.g., a town of masonry buildings sitting on a tectonic fault line), there are economic, social, political, technical, ideological, cultural, educational, ecological, and institutional vulnerabilities (Wilches-Chaux 1989:3:20–41). A local reading of these vulnerabilities will differ from that of an outside observer. If we look at the shape that recovery efforts are taking and where discourse tends to be the most active, I would say New Orleanians perceive themselves to be economically vulnerable above all else, followed closely by political, institutional, and technical vulnerability. The emphasis on the number and rate of businesses reopening has been a local obsession as a measure of recovery progress. The local discursive construction of the disaster (Button 2002) is without a doubt that of a political disaster. Interestingly, one of the most salient transformations of social life in post-K New Orleans has been the emergence of many new and transplanted grassroots political organizations aimed at helping shape city planning efforts and gaining access to resources. In terms of institutional vulnerability, both FEMA and local leaders have placed a high emphasis on the importance of bringing key public institutions back on line—from hospitals and fire departments to museums and jails—in advance of demand by a critical mass of population. In addition, city leadership early on pushed opportunities to shrink the city’s technical lag with the rest of the country. Mayor Nagin won corporate concessions for free wireless networking within the city and has also gained federal support for a major, state-of-the-art GIS system to manage the assessment, rebuilding, and future management of the city’s zoning and infrastructure. One wonders if this emphasis on technical vulnerability does not in part originate in the crisis of the early days of rescue operations, which were severely hampered by failures in communication technologies (this vulnerability may also be seen as a political vulnerability by the incumbent mayor, whose background is as a Cox Communications executive).

Thus, what I am suggesting is that examining the rapid and directed taphonomic processes engaged in by a community immediately following a disaster—what gets destroyed,

rebuilt, redesigned, or built anew—is key to identifying perceived vulnerabilities. If ideological or spiritual, one might expect to see more attention to temples and sacred monuments. Claude Chapdelaine (2000), for example, interprets an unusual sacrificial site at a Moche site, as well as a high-status female burial in an abandoned public area, as responses to the catastrophic effects of El Niño in sixth- and seventh-century Peru (for other spiritual responses to disaster, see Cordell 2000; Lowe et al. 2002:147–153; Torrence and Grattan 2002a:15). If the perceived vulnerability is ecological or economic, one might expect to see more attention to agricultural infrastructure or food storage (Reycraft 2000; Shimoyama 2002). If the vulnerability is of a political nature, one might see emphasis on new public monuments or on resettlement and centralization of residences (for an ethnoarchaeological example of the rapid excavation of public statuary and public architecture from volcanic mudflows, see Crittenden and Rodolfo 2002:57–61; for a posited relationship between earthquakes along the New Madrid fault and Mississippi Valley mound building, see Wingerson 2006). These vulnerabilities expressed on the landscape in the recovery period in turn provide windows onto to the worldview and lived realities of the inhabitants.

In fact, one of the frequent claims that anthropologists of disaster make is that disasters have a special revelatory power:

Disasters divulge matters of time and space use. They bring to the fore the power of place attachment. They un-drape canons and law, customs and practices, the novel from the entrenched tradition. In this manner disasters often reveal the deeper social grammar of a people that lies behind their day-to-day behavior. Disasters also display and articulate the linkages between the local community and larger structures. [Oliver-Smith and Hoffman 2002:10]

At base, what I have been arguing here is that a taphonomic approach to the recovery process expands and deepens this revelatory opportunity, exposing the tensions, vulnerabilities, and conflicts both of the society that existed before the disaster and within the society that is actively remaking itself through rehabilitation. Katrina discourse is full of a language of *exposure* and *stripping bare* and *unveiling* the structural inequalities of contemporary U.S. life—particularly along the lines of race and poverty (see DeParle 2005; Gonzalez 2005). Most of these media portrayals vastly oversimplify a complex demographic landscape and the equal opportunity destruction that Katrina wrought through every type of New Orleans neighborhood. Nevertheless, there is certainly a sense locally, as well as nationally, that the hurricane and levee failures are forcing a more frank engagement with issues of racial equity. At a more sociological level, observers have focused on the ways in which the vulnerabilities exposed by the patterns of Katrina’s victimhood laid stark the social isolation of the elderly and a landscape of “environmental injustice.” Postdisaster analyses of “what went wrong” have also focused on political relations—the idea prevails that the poor working relations and confused

chain of command between city, state, and federal governments were exposed by the delayed rescue efforts in New Orleans (for a diverse sample of academic postdisaster analyses, see Social Science Research Council 2005).

Some theorists go further in their claims regarding the revelatory power of disasters, saying they disclose the social contradictions that inhere in a community (Harvey 1996). Disasters are “constructed” (i.e., we decide to construe an event or process as a disaster) when “contradictions in social relations are expressed through material practices as contradictions within the environment” (Oliver-Smith 2002:36). For example, the fact that the levee failures affected the wealthy and predominantly white Lakeview neighborhood in as devastating a fashion as it did the predominantly black and working-class Lower Ninth Ward undoubtedly contributes to the characterization of Katrina as one of the most devastating catastrophes to hit the United States. It is the extreme measure of the contradiction that provides a sense of the disaster’s magnitude.

Another revelation lies in the logic of poverty. The widespread “looting” following the levee breaks ranged from “foraging” from neighbors’ houses for much-needed food to the absurd but symbolically potent acts of transporting 50-inch flat-screen TVs across fetid floodwaters to be deposited in houses with no electricity. The irrationality of the latter acts of theft is the material for many local jokes. However, in another light these acts reflect a much clearer logic than that which pertains under normal conditions. Since the 1960s, the failed public school system, the rise in residential segregation, suppressed service sector wages, and the poor infrastructure for housing and transportation all mitigate against equal opportunity in the labor market, making it extremely difficult for working-class Louisianans to earn the money required to legitimately purchase their own flat-screen TVs. Thus, looting revealed one of the most fundamental contradictions of late modern capitalism in the United States: a growing discourse of freedom and identity defined through consumption but a shrinking field of opportunities for earnings. The looting and its justifications on the ground exposed what local actors felt to be contradictions in the moral-social order. Returning to the archaeological implications, these contradictions fundamentally involve relations of groups and individuals to material culture in ways not exclusive to the context of capitalism. Recovery, therefore, may involve a rapid response in which the material-social order is restored, or a break with the past as society attempts to resolve the material contradictions revealed by disaster.

Taphonomically, this revelatory power of disaster should extend well into the recovery period. For example, the controversy over the reopening of the Gentilly Landfill (Russell 2005)—over that fundamental taphonomic issue of where to put Katrina’s trash—exposes at least two very important dynamics. It is no coincidence that this landfill resides in a marshy area adjoining the hard-hit Lower 9. Proximity of landfills and toxic sites to poor neighborhoods, and often poor black neighborhoods, has been a historical pat-

tern that underscores the contradictions in the discourse of social equality under democracy. Thus, the decision to reopen the landfill in this neighborhood signaled for some the reassertion of old patterns of environmental inequality and an indication that the social landscape of New Orleans, just like its zoning for landfills, was not to be significantly rewritten. However, the decision to reopen the landfill (also a designated Superfund site) and adapt it to receive the monumental volume of waste from debris removal and demolition following Katrina enacts new nature–culture relations and a new political hierarchy. The containment of construction debris required by federal guidelines because of the infestation of the Formosan termite is forcing a more intimate relation between the city and its trash.

The federal government is imposing a new environmental relation on the local community which reflects a trend throughout the last century for environmental politics to be determined further and further from the local stage. What this containment and more intimate relation with its trash will mean for New Orleans’s nature–culture nexus remains to be seen. However, the inability to export debris and trash combined with the difficulty in finding new sites for landfills within the metro area may mean that the local community will become much more invested in efforts to recycle and reduce waste than in other urban areas (Hamilton 2005). Another interesting result of this new ecological relation is that the export of trash has become criminalized, with a number of people investigated for illegal trash dealing. Thus, a moral economy of trash disposal has both been revealed by Katrina and is being transformed in the social-ecological reconstitution of recovery.

ARCHAEOLOGY OF DISASTER

I am in no way making the claim that the archaeology of disaster is a new subject of study. One could even claim that it is the oldest subfield within the discipline. Excavations began at Pompeii in 1738, long before the word *archaeology* had entered any English dictionary (Parslow 1995). Different regional and thematic genealogies have been offered for the archaeology of disaster, although, with the exception of Raphael Pumpelly’s (1908) work on environmental stress in Neolithic Central Asia, most of the oft-cited pioneering work dates to the era of Processual Archaeology when environmental causality dominated the field (Butzer 1976; Moseley et al. 1981; Sheets and Grayson 1979). Interest in the topic seems to have revived with the recent appearance of two important edited volumes (Bawden and Reyecraft 2000; Torrence and Grattan 2002a). For overviews of the archaeology of disaster, I refer the reader to the introductions of these volumes, as well as Michael Moseley (1997). Here I will offer just a few observations to highlight where my suggestions fit within and beyond this field.

The first point of general agreement regards the issue of scale. Disasters occur in several different time registers—over centuries, generations, weeks, or even minutes. In fact, the two recent volumes cited above emphasize different

ends of the spectrum. Robin Torrence and John Grattan's volume (2002b) concentrates on intense, short-term events such as volcanic eruptions and earthquakes. Richard Reycraft and Garth Bawden (2000) and their contributors focus on "environmental disaster," which generally unfolds along a climatic or ecological timescale that may not have been perceivable to historical actors (e.g., erosion and deforestation in Greece [Runnels 2000]; the aridification of numerous areas of the Old World in the third millennium B.C.E. [Weiss 2000]; or even typhoons contextualized within a 700-year monsoon cycle [Zarins 2000]). This latter type of study on the longue durée of human ecology has been by far the most dominant in the field. Typical examples seek to explain either how societies adapt to and endure major environmental shifts, or how they seek out environmental causes for cases of "collapse," defined as the relatively rapid disintegration of a pattern of lifeways associated with the demise of political institutions and depopulation.

Such grand-scale research appears to be driven by at least two motivating forces, one from within the discipline itself and the other responding to our contemporary condition. In terms of strictly archaeological questions, researchers are not infrequently faced with the problem of explaining relatively sudden changes in cultural systems, such as the "disappearance" of the Anasazi in the Southwest (Cordell 2000) or the abandonment of agricultural lands in the Andes (Chapdelaine 2000; Kolata 2000; Moseley 2002). Tracing these archaeologically sudden events to slowly unfolding disasters such as drought can give the impression of subsuming social evolutionary theory under Darwinian selection theory (and many studies continue in this vein, e.g., Kornbacher 2002; Me-Bar and Valdez 2004), but the prevailing trend in the best of this recent work both respects the realities of material conditions and provides for the contingencies of cultural creativity. They represent a mature rapprochement of environmental determinism of the 1960s and 70s with the cultural constructivism of the 1980s and 90s.

Another impetus for the rise in these types of studies is our contemporary environmental anxieties about global warming, deforestation, overpopulation, species extinction, and pollution. Although not often stated as explicitly as Moseley's (2000:219) exhortation, many archaeologists seem to agree that they "must embolden themselves and investigate natural disasters as significant subjects of contemporary relevance and not merely as quaint curios of antiquity" (see also Morrison 2006). It seems natural that we should be looking to archaeology for examples of how other societies weathered (or collapsed in the face of) major ecological crises.

The contemporary salience of the archaeology of disaster also seems to be moving things in the direction I am urging here—toward an ethnoarchaeology of disaster. Thus, a few studies have examined the formation processes of recent events such as tsunamis and volcanoes, as well as the effects of "recovery," providing us with illustrations of stubborn cultural persistence, radical transformation, or even

forgetfulness (Crittenden and Rodolfo 2002; Davies 2002). Denis Byrne's work (1997, 1998) goes further, making his ethnoarchaeology recursive not only with archaeological studies of human ecology but also with landscape ethnography. He notes how the physical remains of disasters in the Philippines and Indonesia played an important political role for years after the events. He also demonstrates how spaces associated with trauma and disaster in New South Wales acquired spiritual significance as sites newly connected to ancestors and public spaces that embalm and recreate social memories. The new associations of these spaces inevitably affected their taphonomic profile and state of preservation.

On closer inspection, the contrast between the sudden event and environmental disaster studies begins to evaporate. The former are usually framed regionally and consider events such as volcanic eruptions as incidents in a natural cycle. Although historical actors probably viewed these events as dramatic, or even cataclysmic, most researchers perceive them over the long term to form a rhythmic and somewhat predictable pattern (Davies 2002; Saltonstall and Carver 2002; Shimoyama 2002). Thus, although there are significant contrasts in how disasters of different scales are experienced, in both cases archaeology has usually taken the long view. In fact, the majority of the sudden event studies emphasize the minimal impact such disasters had for human societies when examined in regional or culture-historical perspective.

Another intriguing contrast between these scalar approaches relates to taphonomy. By and large, the grand-scale environmental studies are extremely cautious in identifying the taphonomic evidence for natural disasters and their links to cultural contexts (although for exceptions based on detailed geomorphology, see Chapdelaine 2000; Runnels 2000). Some even suggest that disasters may be taphonomically "invisible" (Morrison 2000:30; Santley et al. 2000:159). The sudden event studies, however, are often quite successful, and quite detailed, in their taphonomic identifications. Certainly part of the reason lies in the types of disasters and the impacts they leave. Volcanic eruptions leave extensive and datable tephra falls and lava flows that cap archaeological deposits as well as identifiable chemical signatures in polar ice cores (Lowe et al. 2002; Manning and Sewell 2002). Earthquakes expose faults, upheave berms of rock, and cause whole coastlines to disappear (Saltonstall and Carver 2002; Wingerson 2006). Tsunamis deposit large coral boulders hundreds of meters inland (Davies 2002:40). Droughts, however, must often be inferred from tree-ring data, pollen analysis, or soil erosion patterns. The researcher must demonstrate that the observed effects are regional and climatic rather than local and coincidental. Although the growing subsidiary field of geoarchaeology has bolstered our confidence in deciphering taphonomic processes, generally the slower the change, the subtler the evidence.

I have presented this overview of the archaeology of disaster to make clear the points of my departure. What I am advocating here is the value of engaging in a local

archaeology of disaster in the short term (or perhaps very short term) that casts its glance backward rather than teleologically forward. Disaster writ large over the long term may be dramatically visible across regional landscapes in the abandonment or disappearance of settlements. But other types of disasters—those of the short term, those of a more contingent than chronic nature—should also be visible taphonomically within particular sites. Floods (whether caused by high rainfall, tsunamis, or hurricanes) usually leave clear depositional signatures on archaeological sites, yet rarely are these interpreted as anything more than chronological aids. Mudslides, fires, even warfare leave readable strata. To view these as catastrophic events and to evaluate the reaction of the community in the subsequent “recovery” strata has great potential, I would argue, for revealing the structure of that society both before the disaster and in its immediate and active remaking. Special attention should be paid to trash deposition, demolition, renovation, and new construction in the recovery strata as processes of social (re)formation. One of the few examples of this type of orientation is the interpretation of Robert Santley and colleagues that significant ash deposits from a volcanic eruption were quickly cleaned away from Classic period Maya sites because “the large scale of the Middle Classic Matacapán polity enabled it to concentrate resources at the political capital” (2000:158). In another example, Jan Driessen (2002) offers a more subtle interpretation of the effects of the Santorini eruption on Minoan culture. This study provides a fine-grained taphonomic view of “disintegration,” in which the psychological effects of the dramatic event as well as the social inequalities its immediate effects revealed acted as catalysts for major political and social reformation. The stratigraphy of archaeological sites on Crete suggests that looting and failed attempts to resurrect political architecture characterized the recovery phase (perhaps a misnomer in this case). The resulting cultural transformation nevertheless took two or three generations to fully unfold.

Disasters occur at all types of scales, but it would appear that archaeologists have generally neglected the smaller, shorter-term type as well as those of a more clearly man-made sort. One rare example of a microevent study vividly demonstrates the possibilities of the small scale. Martin Gibbs’s (2002) analysis of the remains of a 1629 shipwreck and associated survivor camps (where mutineers murdered dozens of survivors) weaves together an archaeology of emotion with a sociology of disaster. The warp and woof of this stunning archaeological story includes considerations of landscape commemoration and salvage activity in the recovery period.

Still, small-scale disasters are by and large ignored. I am struck by the fact that not one major paper in the archaeology of disaster literature reports on an instance of structural fire, which is surely one of the most common disasters to plague human settlements and taphonomically quite identifiable through controlled excavation. Also peculiarly absent are accounts of wars and epidemics except as

the fallout of cataclysmic natural events. Some scholars intentionally exclude warfare from disaster studies as another class of phenomena (Oliver Smith and Hoffman 2002), but I am unconvinced that this exclusion is justified. Indeed, such comparisons between war recovery and natural disaster recovery may be quite illuminating.

Archaeologists also have a tendency to overlook instances of local crime and violence, or they attribute the evidence of such eruptions to intersocietal warfare rather than intrasocietal conflict. Because disasters have a way of ripping away masks from social contradictions and letting loose sublimated community tensions, looting, vandalism, and mob violence are often part of the improvised drama of disaster (despite its excellent preservation, much of Pompeii was extensively looted soon after the eruption of C.E. 79; see Allison 2002:114). The contours of social fissure are one of the many revelations possible through taphonomic studies of disaster. My suggestion to “look backwards” means that the object is not so much the disaster itself as the tensions and contradictions it unveils.

For a final example that drives home the political and spiritual salience of debris removal and landscape rehabilitation following a manmade disaster, we need look no further than September 11. Several studies by astute ethnographers have recognized the import of taphonomic processes at Ground Zero (e.g., Low 2004; Sturken 2004). Most of the recent publications on the anthropology and archaeology of disaster were already in press or published at the time of the September 11, 2001, attacks and the devastating 2004 Tsunami. It will be interesting to see how these events as well as Hurricane Katrina transform the research trends identified here.

CONCLUSION

In May 2006, as I was putting the finishing touches on this article in the wee hours, a news flash came across my web browser: “A New Landfill in New Orleans Sets Off a Battle.”

Like so many disputes that have erupted since the hurricane, this one involves some highly charged issues: politics, money, history and race. Not to mention a highly developed distrust of government that almost all Louisianans now seem to share. Unlike most residents of eastern New Orleans, the Vietnamese have returned, rebuilt and drawn up elaborate plans for their 30-year-old community’s future. Now they feel unwelcome. . . . “They’re threatening our very existence,” Father Vien said of the government agencies that approved the dump site, which residents fear will tower 80 feet or more above their neighborhood, dwarfing the new church they are planning to build, once the Federal Emergency Management Agency trailers are gone from the site. Father Vien said he was particularly worried about the quality of water in the canal and the lagoon that run through the neighborhood of tidy brick houses. Residents use that water on the tiny waterside gardens that supply the community with sugar cane and bitter melon and Vietnamese varieties of vegetables, he said. He and his parishioners are particularly angry at Mayor C. Ray Nagin, who in February used emergency powers to waive zoning regulations

for the landfill. "Maybe we're not the right kind of people he wanted to return," Father Vien said. [Eaton 2006]

This story reiterates several points I have been making here, the most important of which is that taphonomic processes—processes of burial, trash disposal, earth moving, and landscape modification—are particularly active and especially critical in the (re)formation of a community following a major disaster. These processes are not simply an archaeological mirror of social processes—they are social processes. Like religion or politics, taphonomy is a domain of activity integral to defining new terms of the culture–nature divide, addressing perceived vulnerabilities, and working out social contradictions and contestations exposed by disaster. Debris and human remains are the physical manifestation of disaster and their presence largely defines the duration of the disaster event. Chuck Carr Brown with the Louisiana Department of Environmental Quality remarked: "You cannot rebuild until you clean up, I am still in the eye of the storm" (Eaton 2006).

At stake in this newest controversy is the city's boundary with nature, local political sovereignty, and the vulnerability of ethnic minorities in the new New Orleans. The place names involved speak poetically to the cosmological, ecological, and political issues involved in the taphonomic process. The proposed site rests between Bayou Sauvage (meaning "wild" in French), "the largest urban wildlife refuge in the country," and Versaille, a cultured and cultivated tract of land occupied by one of the most cohesive immigrant communities in the state. The name of the proposed landfill is "Chef Menteur" (meaning "Chief Liar" in French). An ethnoarchaeology of this battle, and of this battle site, can provide rich material for both the ethnographer of disaster and the archaeologist of recovery.

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NOTE

Acknowledgments. I am grateful for the encouragement and suggestions of Rosemary Joyce, Benjamin Blount, Thomas Hales Eubanks, T. R. Kidder, Adam Smith, and the rest of my collegial colleagues at the University of Chicago. Any remaining gaffs remain my own. Gratefully dedicated to the memory of Tom Eubanks.

1. In actual practice, archaeologists use *taphonomy* to describe both the study of formation processes and the processes themselves. I will follow this practice, using both meanings.

REFERENCES CITED

- Allison, Penelope M.
2002 Recurring Tremors: The Continuing Impact of the A.D. 79 eruption of Mt. Vesuvius. *In* *Natural Disasters and Cultural Change*. R. Torrence and J. Grattan, eds. Pp. 107–125. London: Routledge.
- Bawden, Garth, and Richard Martin Reycraft
2000 *Environmental Disaster and the Archaeology of Human Response*. Albuquerque: Maxwell Museum of Anthropology, University of New Mexico.
- Berry, Jason
2005 Pompeii on the Mississippi. *Boston Globe*, December 7: A21.
- Blaikie, Piers, Terry Cannon, Ian Davis, and Ben Wisner
1994 *At Risk: Natural Hazards, People's Vulnerability, and Disasters*. New York: Routledge.
- Button, Gregory V.
2002 Popular Media Reframing of Man-Made Disaster. *In* *Catastrophe and Culture: The Anthropology of Disaster*. S. Hoffman and A. Oliver-Smith, eds. Pp. 143–159. Santa Fe: School of American Research Press.
- Butzer, Karl W.
1976 *Early Hydraulic Civilization in Egypt: A Study in Cultural Ecology*. Chicago: University of Chicago Press.
- Byrne, Denis
1997 The Archaeology of Disaster. *Public History Review* 6:17–29.
1998 In Sad but Loving Memory: Aboriginal Burials and Cemeteries of the Last 200 Years in NSW. Hurstville, New South Wales: NSW National Parks and Wildlife Service.
- Chapdelaine, Claude
2000 Struggling for Survival: The Urban Class of the Moche Site, North Coast of Peru. *In* *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R. Reycraft, eds. Pp. 121–142. Albuquerque: University of New Mexico Press.
- Comaroff, John L., and Jean Comaroff
1992 *Ethnography and the Historical Imagination*. Boulder, CO: Westview Press.
- Cordell, Linda
2000 Aftermath of Chaos in the Pueblo Southwest. *In* *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R. Reycraft, eds. Pp. 179–194. Albuquerque: University of New Mexico Press.
- Corley, Cheryl
2006 New Orleans Awaits Decision on Ninth Ward. NPR, May 30, 2006.
- Crittenden, K. S., and K. S. Rodolfo
2002 Bacolor Town and Pinatubo Volcano, Philippines: Coping with Recurrent Lahar Disaster. *In* *Natural Disasters and Cultural Change*. R. Torrence and J. Grattan, eds. Pp. 43–65. London: Routledge.
- Davies, Hugh
2002 Tsunamis and the Coastal Communities of Papua New Guinea. *In* *Natural Disasters and Cultural Change*. R. Torrence and J. Grattan, eds. Pp. 28–42. London: Routledge.
- Dawdy, Shannon Lee
1998 Madame John's Legacy (16OR51) Revisited: A Closer Look at the Archaeology of Colonial New Orleans. New Orleans: University of New Orleans.
2000 Understanding Cultural Change through the Vernacular: Creolization in Louisiana. *Historical Archaeology* 34(3):107–123.
- Denys, Christiane
2002 Taphonomy and Experimentation. *Archaeometry* 44(3):469–484.
- DeParle, Jason
2005 Broken Levees, Unbroken Barriers. *New York Times*, September 4: 4.
- Dewan, Shaila
2006 In Attics and Rubble, More Bodies and Questions. *New York Times*, April 11: A1.
- Driessen, Jan
2002 Towards an Archaeology of Crisis: Defining the Long-Term Impact of the Bronze Age Santorini Eruption. *In* *Natural Disasters and Cultural Change*. R. Torrence and J. Grattan, eds. Pp. 250–263. London: Routledge.
- Eaton, Leslie
2006 A New Landfill in New Orleans Sets Off a Battle. *New York Times*, May 8: A1.
- Foucault, Michel
1972 *The Archaeology of Knowledge and the Discourse on Language*. New York: Pantheon Books.
- Gibbs, Martin
2002 Maritime Archaeology and Behaviour during Crisis: The Wreck of the VOC Ship Batavia (1629). *In* *Natural Disasters and Cultural Change*. R. Torrence and J. Grattan, eds. Pp. 66–86. London: Routledge.

- Gonzalez, David
2005 From Margins of Society to Center of the Tragedy. *New York Times*, September 2: A1.
- Hamilton, Bruce
2005 Three Decades Worth of Trash. *Times-Picayune*, November 16: A1.
- Harvey, David
1996 *Justice, Nature, and the Geography of Difference*. Cambridge, MA: Blackwell Publishers.
- Hoffman, Susanna
2002 The Monster and the Mother: The Symbolism of Disaster. In *Catastrophe and Culture: The Anthropology of Disaster*. S. Hoffman and A. Oliver-Smith, eds. Pp. 113–141. Santa Fe: School of American Research Press.
- Kolata, Alan L.
2000 Environmental Thresholds and the “Natural History” of an Andean Civilization. In *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R. Reyecraft, eds. Pp. 163–178. Albuquerque, NM: University of New Mexico Press.
- Kornbacher, Kimberly D.
2002 Horsemen of the Apocalypse: The Relationship between Severe Environmental Perturbations and Culture Change on the North Coast of Peru. In *Natural Disasters and Cultural Change*. R. Torrence and J. Grattan, eds. Pp. 204–234. London: Routledge.
- Low, Setha M.
2004 The Memorialization of September 11: Dominant and Local Discourses on the Rebuilding of the World Trade Center Site. *American Ethnologist* 31(3):326–339.
- Lowe, D. J., R. M. Newnham, and J. D. McCraw
2002 Volcanism and Early Maori Society in New Zealand. In *Natural Disasters and Cultural Change*. R. Torrence and J. Grattan, eds. Pp. 126–161. London: Routledge.
- Manning, Sturt W., and David A. Sewell
2002 Volcanoes and History: A Significant Relationship? The Case of Santorini. In *Natural Disasters and Cultural Change*. R. Torrence and J. Grattan, eds. Pp. 264–291. London: Routledge.
- Me-Bar, Y., and F. Valdez, Jr.
2004 Recovery Time after a Disaster and the Ancient Maya. *Journal of Archaeological Science* 31(9):1311–1324.
- Mignon, Molly Raymond
1993 *Dictionary of Concepts in Archaeology*. Westport, CT: Greenwood Press.
- Morrison, Kathleen D.
2000 Naturalizing Disaster: From Drought to Famine in Southern India. In *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R. Reyecraft, eds. Pp. 21–34. Albuquerque: University of New Mexico Press.
2006 Archaeology: Failure and How to Avoid It. *Nature* 440(7085):752–754.
- Moseley, Michael
1997 Climate, Culture, and Punctuated Change: New Data, New Challenges. *Review of Archaeology* 18:19–27.
2000 Confronting Natural Disaster. In *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R. Reyecraft, eds. Pp. 219–223. *Anthropological Papers*, vol. 7. Albuquerque, NM: Maxwell Museum of Anthropology.
2002 Modeling Protracted Drought among Turkana Pastoralists: Implications for Anthropological Theory and Hazards Research. In *Catastrophe and Culture: The Anthropology of Disaster*. S. Hoffman and A. Oliver-Smith, eds. Pp. 187–212. Santa Fe: School of American Research Press.
- Moseley, Michael, Robert Feldman, and Charles Ortloff
1981 Living with Crisis: Human Perceptions of Process and Time. In *Biotic Crises in Ecological and Evolutionary Time*. M. H. Nitecki, ed. Pp. 231–267. New York: Academic Press.
- Oliver-Smith, Anthony
2002 Theorizing Disasters: Nature, Power, and Culture. In *Catastrophe and Culture: The Anthropology of Disaster*. S. Hoffman and A. Oliver-Smith, eds. Pp. 23–47. Santa Fe: School of American Research Press.
- Oliver-Smith, Anthony, and Susanna M. Hoffman
2002 Introduction: Why Anthropologists Should Study Disasters. In *Catastrophe and Culture: The Anthropology of Disaster*. S. Hoffman and A. Oliver-Smith, eds. Pp. 3–22. Santa Fe: School of American Research Press.
- Parslow, Christopher Charles
1995 *Rediscovering Antiquity: Karl Weber and the Excavation of Herculaneum, Pompeii, and Stabiae*. Cambridge: Cambridge University Press.
- Price, Richard
1983 *First-Time: The Historical Vision of an Afro-American People*. Baltimore: Johns Hopkins University Press.
- Pumpelly, Raphael
1908 *Explorations in Turkestan, Expedition of 1904*. Washington, DC: Carnegie Institution.
- Reycraft, Richard Martin
2000 Long-Term Human Response to El Niño in South Coastal Peru, circa A.D. 1400. In *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R. Reyecraft, eds. Pp. 99–120. Albuquerque, NM: Maxwell Museum of Anthropology.
- Reycraft, Richard Martin, and Garth Bawden
2000 Introduction. In *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R. Reyecraft, eds. Pp. 1–10. Albuquerque: University of New Mexico Press.
- Runnels, Curtis
2000 Anthropogenic Soil Erosion in Prehistoric Greece: The Contribution of Regional Surveys to the Archaeology of Environmental Disruptions and Human Response. In *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R. Reyecraft, eds. Pp. 11–20. Albuquerque, NM: Maxwell Museum of Anthropology.
- Russell, Gordon
2005 Landfill’s Reopening Is Raising New Stink. *Times-Picayune*, November 21: A1.
- Sahlins, Marshall David
1985 *Islands of History*. Chicago: University of Chicago Press.
2004 *Apologies to Thucydides: Understanding History as Culture and Vice Versa*. Chicago: University of Chicago Press.
- Saltonstall, Patrick, and Gary A. Carver
2002 Earthquakes, Subsidence, Prehistoric Site Attrition and the Archaeological Record: A View from the Settlement Point Site, Kodiak Archipelago, Alaska. In *Natural Disasters and Cultural Change*. R. Torrence and J. Grattan, eds. Pp. 172–192. London: Routledge.
- Santley, Robert S., Stephen A. Nelson, Bently K. Reinhardt, Christopher A. Pool, and Philip J. Arnold III
2000 When Day Turned to Night: Volcanism and the Archaeological Record from the Tuxtla Mountains, Southern Veracruz, Mexico. In *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R. Reyecraft, eds. Pp. 143–162. *Anthropological Papers*, vol. 7. Albuquerque, NM: Maxwell Museum of Anthropology.
- Schiffer, Michael B.
1987 *Formation Processes of the Archaeological Record*. Albuquerque: University of New Mexico Press.
- Sheets, Payson D., and Donald K. Grayson
1979 *Volcanic Activity and Human Ecology*. New York: Academic Press.
- Shimoyama, Satoru
2002 Volcanic Disasters and Archaeological Sites in Southern Kyushu, Japan. In *Natural Disasters and Cultural Change*. R. Torrence and J. Grattan, eds. Pp. 326–341. London: Routledge.
- Social Science Research Council
2005 *Understanding Katrina: Perspectives from the Social Sciences*. Electronic document, <http://understandingkatrina.ssrc.org>, accessed June 18, 2006.
- Sturken, Marita
2004 The Aesthetics of Absence: Rebuilding Ground Zero. *American Ethnologist* 31(3):311–325.
- Tarlow, Sarah
2000 Emotion in Archaeology. *Current Anthropology* 41(5): 713–746.
- Torrence, Robin, and John Grattan
2002a The Archaeology of Disasters: Past and Future Trends.

- In* Natural Disasters and Cultural Change. R. Torrence and J. Grattan, eds. Pp. 1–18. London: Routledge.
- Torrence, Robin, and John Grattan, eds.
2002b *Natural Disasters and Cultural Change*. New York: Routledge.
- Trouillot, Michel-Rolph
1995 *Silencing the Past: Power and the Production of History*. Boston, MA: Beacon Press.
- Vale, Lawrence J.
2005 Rebuild or Relocate? New Orleans Will Rise Again. *Boston Globe*, September 25: D12.
- Waters, Michael R., and David D. Kuehn
1996 The Geoarchaeology of Place: The Effect of Geological Processes on the Preservation and Interpretation of the Archaeological Record. *American Antiquity* 61(3):483–497.
- Weiss, Harvey
2000 Beyond the Younger Dryas: Collapse as Adaptation to Abrupt Climate Change in Ancient West Asia and the Eastern Mediterranean. *In* *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R. Reycraft, eds. Pp. 75–98. Albuquerque, NM: Maxwell Museum of Anthropology.
- Wilches-Chaux, Gustavo
1989 Desastres, ecologismo, y formación profesional (Disasters, environmentalism, and professional training). Popayan: Servicio Nacional de Aprendizaje (SENA; or National Learning Service of Colombia).
- Williams, Brian
2006 The Search for Remains in New Orleans. *NBC Nightly News*, MSNBC, April 28.
- Wingerson, Lois
2006 In Search of Ancient Earthquakes. *Archaeology* 59(1):30–35.
- Zarins, Juris
2000 Environmental Disruption and Human Response: An Archaeological-Historical Example from South Arabia. *In* *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R. Reycraft, eds. Pp. 35–51. Albuquerque, NM: Maxwell Museum of Anthropology.