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James Francis Warren

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JAMES FRANCIS WARREN

Typhoons and the Inequalities of Philippine Society and History

Cyclonic storms have helped shape the character of particular regions and areas in the Philippines. But typhoons have not affected all people and all areas in the archipelago equally. Patterns of death and damage from cyclonic storms and the capacity of people to recover and reconstruct their livelihoods reveal differences based on history, regional wealth, and sociopolitical organization. This article provides comparative examples and explores aspects of the impacts of typhoons—specifically those of 1831, 1882, 1970, 2004, 2006, 2009, and 2013—on Philippine society and history, with particular reference to population increase and cyclonic storms; economic development and typhoons; and political development and typhoons.

KEYWORDS: PHILIPPINE TYPHOONS · POPULATION INCREASE · ECONOMIC DEVELOPMENT · POLITICS · EXTREME WEATHER

Typhoons, as the offspring of water and air, are powered by heat from the sea, high planetary winds, and their own violent energy. The circulations of the cyclonic winds near the eye may gust to more than 125 miles per hour (mph) (200 kilometers per hour [km/h]), and an entire typhoon can cover the ocean's surface and dominate the lower atmosphere over thousands of square miles, with giant whirlwinds covering tens of thousands of square miles in the upper atmosphere (*Baton Rouge State Times* 1985, 1–B).

In the Philippines, typhoons and floods cause more annual damage than any other natural hazard. The Philippine typhoon season follows a fairly regular pattern, beginning mid-year and reaching its peak between September and November, with the strongest cyclonic storms occurring then.¹ Each year an average of nineteen tropical cyclones work their way west from the Caroline Islands and the Marianas in the western Pacific Ocean before moving directly toward the Philippines. The densely populated island of Luzon and the Visayan islands are most seriously affected by the typhoons, while most of Mindanao and the Sulu archipelago are not typhoon-prone areas.

A significant difference between the types of natural hazard in the Philippines must be noted here: some, like typhoons, are “processual,” occurring on an annual basis, while others are infrequent, sudden-onset events, and governed by the geophysical laws of probability, such as the abnormally rapid destruction caused by an earthquake, volcanic eruption, or flash flood (Clancey 2003). Hence, typhoons are major weather phenomena that most inhabitants of the Philippines have had to confront annually across the centuries. With the passage of time, typhoons have become an increasingly serious and growing developmental challenge with long-term social and economic consequences.

While individual calamities have found a place in some studies of cities, colonies, and nations in Southeast Asia, few scholars have considered typhoons as important agents of change or explored in detail the cultural impacts, perception, and meaning of the cyclonic storm in daily life. There are exceptions, however; I am thinking particularly of some important work on the Philippines as well as on various Latin American countries, including Mexico and Peru (Bankoff 2003; Bankoff et al. 2004; Pérez 2011; Garcia-Acosta 2002; Hoffman and Oliver-Smith 1999; Hoffman 1999; cf. Juneja and Mauelshagen 2007). Given the state of scholarship, I intend to rectify

it by writing the workings of the weather and climate back into Philippine history: an innovative project to offer a fresh interpretation of the cyclonic storm as a crucial factor in the development of the nation and its links with the Asia-Pacific basin.

Typhoons: Approach and Methodology

In the context of my research, typhoon disasters and their impacts, and the hidden health consequences that often linger for years in their aftermath, become part of a conceptual–analytical framework to help establish how people ordinarily live with and respond to a natural hazard and the risk that this hazard creates and imposes across time. Related also to an investigation of the workings of the weather and climate, and to environmental history, this study of Philippine typhoons focuses as well on particular remarkable cyclonic storms—like the great typhoons of 1831, 1882, 1970, 2009, and 2013—and clusters of disasters—such as the tightly spaced storms of December 2004 and 2006—as possible turning points in the history of a capital, a region, or even a nation.

The investigation of Philippine typhoon variability on an interannual or interdecadal timescale, and over longer periods, is hampered by the short period of time in which accurate records concerning frequency of occurrence, area of occurrence, mean and maximum intensity, and rain and wind structure become available. The instrumental record is limited prior to the twentieth century, and it is certainly difficult to reconstruct a fully reliable analysis of typhoon trends in the era of preinstrument observation. However, despite the lack of earlier records based on reliable measurements, a great deal of useful information exists about typhoon patterns and trends in the Philippine past.

From the sixteenth (1565) to the twenty-first century (2015), the Philippines has been struck by roughly between 4,500 to 9,000 typhoons, or an average of ten to twenty cyclonic storms annually. While a colony in the British greater Caribbean, another tropical cyclone-prone area of the globe, could expect a hurricane about once a decade, the frequency of typhoons in the Philippines was far greater than in any other early modern society on the face of the earth (see Schwartz 2015). Their recurrent nature and impact, especially in recent times, have enabled a historical investigation of how either a society or nation copes or fails to do so over both short and longer time spans. Most importantly, in this context, recurrent often tightly spaced

calamities can lead to a tipping point, when national capacity and coping resources dwindle and in extreme cases cause societal collapse (see Hoffman and Oliver-Smith 1999, 1–16; Hoffman 1999, 302, 311).

I want to briefly stress here the overriding importance of the temporal dimension to understand the character and development of so-called natural disasters. They unfold historically—even seemingly sudden-onset events like earthquakes or huge storm surges. The preconditions for such disasters, namely the “root causes” and “dynamic pressures,” have often been forming over a long time span. Indeed, Anthony Oliver-Smith (1994) treats the Peruvian earthquake of 1970 as having “root causes” that stretched back 500 years to the trauma of the Spanish conquest of the Inca Empire. The consequent biological and social collapse led to a loss of traditional methods to cope with environmental risk (*ibid.*).² In other words, there is an ecological dimension to the making of the Third World and the ensuing gap that has opened up between industrialized and nonindustrialized parts of the world.

By the last quarter of the nineteenth century, large parts of Asia, Africa, and Latin America had experienced significant environmental damage caused by deforestation and depletion of soil fertility. Consequently, today, because of the historical and ecological origins of the development of underdevelopment, the least developed nations in the course of a little over half a millennium continue to suffer the worst excesses of environmental destruction. In the Philippines, for example, the excesses are perpetrated by human institutions, in particular capitalist institutions, skewed to favor the interests of a handful of powerful elite families and provincial warlords (Aguilar 1998; Bello et al. 1982; Billig 2003; Broad and Cavanagh 1993; Fast and Richardson 1982; McCoy 1994).

Typhoons: Natural or Unnatural Disasters

Tropical cyclones, flooding rain, and drought are natural hazards that have historically culminated in violent deaths, acute hunger, disease, and widespread property loss in communities across the Philippines. I define disaster to be a meteorological event that creates such severe physical damage to a community, region, or nation to the point that virtually all major public and private facilities can no longer provide essential social and economic services unless either replaced or repaired.

Here, it is important to note that the distinction between natural and unnatural, or man-made, disaster is difficult to sustain presently. Around the

world a growing share of the devastation triggered by so-called natural disasters stems from ecologically destructive practices and from increasingly situating ourselves in harm’s way. In the Philippines, since the end of the eighteenth century, many ecosystems have been either damaged or destroyed, setting the stage for an escalation of “natural disasters” caused by typhoons—and storm surges, floods, and landslides. In other words, by the twentieth century, these “natural disasters” had become more frequent and more severe due to human actions and institutions (Abramovitz 2001, 123–24).

Terry Cannon (1994, 14) argues that “hazards are natural but . . . disasters are not.” The stress here is on people’s vulnerability, or their material condition and force of circumstance, which makes it possible for a natural hazard to become a disaster. He includes in his analysis of risk, the extent and types of people’s vulnerability and the capacity of society to cope with the hazard from the standpoint of mitigation and resilience, or the capacity to recover and reduce the risk of such future disasters (*ibid.*). He argues that the factors which turn a natural hazard, such as a typhoon, into a natural disaster require comparative analyses of various economic and political systems and the ways they shape societies, with similar hazards sometimes leading to very different impacts on one society compared to another (*ibid.*, 26).

Authors like Piers Blaikie and colleagues (1994, 11–14) have attempted to introduce the “human factor” into the interpretation of calamity by explaining more clearly how one makes the transition “from very widespread conditions such as ‘poverty’ to very particular vulnerabilities that link the political economy to the actual hazards that people face.” Here, like these social scientists, I must develop an approach that takes account of the interactions of humans with their environment, but one that is also hazard specific. By historically describing and analyzing across time, and through space, the major cultural/ecological problems that have confronted Filipino people in their annual encounters with typhoons, the distinction drawn between natural and unnatural, or human-induced disasters, disappears. Instead, a natural hazard, such as a cyclonic storm, when framed this way is situated in its proper climatic, social, material, and historical context (Morren 1983, 284).

Typhoons have not affected all people and all areas in the Philippines equally. Patterns of death and destruction caused by cyclonic storms and the capacity of people to reconstruct their livelihoods in the aftermath of such

disastrous events reveal differences based on their history, regional wealth, and sociopolitical organization (Blaikie et al. 1994, 147–49).

Disasters also occur in gendered contexts. Filipino women have generally been defined as more vulnerable than men in typhoon and flood disasters. Gendered vulnerabilities in typhoon catastrophes depend upon an interconnected set of factors, including gender, class, ethnicity, and age. Bankoff (2003, 179–83) has stressed that learning to live with hazard and the expectation of disaster is necessarily part of a culture's routine of daily life. But this expectation does not alter the stark reality that, if twenty-first century cyclonic storms continue to increase in intensity and scale, there will be few safe havens left in typhoon-prone regions for women, children, the indigent, and elderly to seek sanctuary because of the recurrent scale of damage and increased risks caused by such extreme weather.³ Catastrophic typhoon and flood disasters like Babs (locally known as Loleng, 1998), Ketsana (Ondoy, 2009), Bopha (Pablo, 2012), and Haiyan (Yolanda, 2013) take Filipinos, but especially women and children, socially and psychologically back “to their core” (Hoffman 1999, 310). As Susanna Hoffman (ibid.) notes, amid “the rubble and debris” of such supertyphoons, “a researcher can behold the fundamental constructs that underpin their social world, and, thread by thread, observe (read-untangle) the web of that world.” Disasters are, as she states, “the closest thing a student of society ever approaches to a natural laboratory” (ibid.). Therefore, the historian of climate and society should also employ an ethnographic approach, in order to resurrect the local knowledge and experiences of such Filipinos and their communities that annually face the calamity of large typhoons (ibid.).⁴

The actual horrendous impacts of a recent extreme typhoon on individual lives, social structures, and societal shifts have been powerfully demonstrated by Supertyphoon Haiyan (8 November 2013), which wrought so much devastation upon Tacloban and surrounding areas. As Tarique Niazi (2013, 1) expressed so thought-provokingly, “Super-storm Haiyan . . . buffeted the most vulnerable of Filipinos, 40% of whom live below the poverty line (i.e., \$1.25 a day).” Many people were fisherfolk whose livelihood compelled them to live “dangerously close to the shoreline of the western Pacific . . . [in some cases] just one meter above sea level” (ibid.). He went on to say, “The cumulative losses in lives and livelihoods, homes and hearths, businesses and infrastructure have no parallel in Philippines history, just as Haiyan has no precedent in the annals of meteorology” (ibid.).

The Age-Old Variables: Population Increase and Cyclonic Storms

The population of the Philippines has grown at a remarkable rate over the five centuries under investigation; starting from around 668,000 people in 1591 its population grew to 61 million by 1990 (Doeppers and Xenos 1998, 3–4). Before the coming of Spanish and American colonialism and economic change and development in the Philippines, natural disasters were isolated in space and time. After the advent of colonial rule, however, natural disasters involved the behavior of global markets, large-scale movements of rural populations and subsistence crises, and became systematic through space and time. But the increasingly widespread nature of these adverse impacts did not necessarily imply uniformity of impact (Torry 1979, 531). Mike Davis (2001, 279–80), in *Late Victorian Holocausts? El Niño Famines and the Making of the Third World*, has forcefully argued that the poorest classes and regions suffered the most under colonial rule in the final decades of the Victorian era as large parts of Asia, Africa, and Latin America situated along the equator experienced significant environmental damage caused by deforestation and depletion of soil fertility, and famines and mass death on a hitherto unprecedented scale (cf. Marks 2002, 146–47).

At the start of the twentieth century, the timber industry continued to clear tropical forests from many of the watersheds on key islands. In addition, US agricultural corporations increased land pressure in different parts of the archipelago through large-scale acquisition of arable land for growing pineapples, bananas, sugarcane, and other commodity-driven export crops. Basic assumptions of Spanish and American colonial policy and practice about the cause-and-effect relationship between population growth, agricultural development, and resource exploitation are now deemed totally incompatible with the social and environmental policies required for future attainment of ecological sustainability. But patterns of conspicuous consumption by a minority in the capital, of plundering of natural resources and exploitation of precarious labor by a wealthy landed elite, and of spiraling population growth in typhoon-prone provinces continue to place ever increasing social strains on people's lives and the environment. The single greatest environmental problem facing the Philippines now is population growth. Major areas of the Philippines in typhoon- and flood-prone regions are already impoverished with great loss of arable soil due to the development of monocrop economies and mineral and resource exploitation, but there will be an estimated 110

million Filipinos by 2020 and over 143 million by 2040 (UN Department of Economic and Social Affairs n.d.). To a certain extent the early colonial Philippines escaped the extraordinary scale of the demographic collapse of Spanish America caused by the widespread introduction of Old World diseases and the trauma of conquest.⁵ But the recent impacts of clusters of supertyphoons on a much larger present-day population mean that the scale of these crises is quite different from the past and potentially far worse.

The effects of typhoons on densely populated cities across the archipelago have been particularly catastrophic in recent times, notably in the case of Cebu City (1990), Ormoc (1991), Metro Manila (2009), and Tacloban (2013). Comparative work on rapid urbanization and recent hurricane and flood disasters highlights the vulnerability of cities in the Caribbean. Like Bridgetown in Barbados, Georgetown in Guyana, and Santo Domingo in the Dominican Republic, cities and towns in the Philippines have become more disaster prone with increased population densities, increased degraded infrastructure, and increased unfettered private sector economic activity (Pelling 2003, 103–4, 121–23, 141–42). One consistent factor that helps explain the scale of the damage inflicted by these recent extreme storms is the unrelenting growth of population and spread of periurban settlements. A century earlier, or even fifty years ago, a Philippine typhoon may have destroyed a village or town, whereas today it destroys a modern city like Cebu City in 1990 and Tacloban in 2013 (cf. McKnight 1990, 6). While the intensity of such storms has increased due to global warming, so too have the calamitous impacts due to the escalating number of Filipinos living in vulnerable situations, especially in low-lying coastal areas and towns. They have taken a big gamble assuming the cyclonic activity of the past century will continue unchanged into the future. But if the meteorological projections prove correct, then tens of millions of Filipinos are already living in the path of great danger.

The Age-Old Variables: Economic Development and Cyclonic Storms

Hewitt (1983) and Blaikie et al. (1994) have argued that social-historical forces as much as nature on a rampage cause calamities. Therefore, despite the catastrophic impacts of typhoons on Philippine production systems, agriculture, and patterns of economic development at certain times, cyclonic storms are still just one of several key factors that either accelerate

or decelerate social and economic development. In this context then, the other remarkable “storm” that transformed the Philippine landscape and its people in the nineteenth and twentieth centuries, and the economic and social structures of various areas of the archipelago, was the large-scale development of commercial export crops, particularly the monocrop economies of tobacco, abaca, sugarcane, and copra. These colonial initiatives, which linked the development of underdevelopment to natural hazards and caused important changes in the relationship between Filipinos and the natural world, coincided with the progressive integration of the nineteenth-century Philippines into world trade and markets, and the onset of the industrial era under colonial rule.

Filipinos are still heavily dependent on agriculture for their livelihood. In a country known for remarkable typhoons and large floods, it is a cruel irony that around 40 percent of the population still earns a living by farming (Hookway 2007, 47). In 1974 agriculture not only contributed close to one third of net domestic product, it also provided about two thirds of Philippine export earnings (Vreeland et al. 1976, 261). Typhoons and floods have affected the agricultural sector across the centuries, causing serious production losses that have inhibited total economic growth. These crop losses have also resulted in food shortages that have posed a serious threat to regional food security in the past.

Both Spain and the US encouraged agricultural practices that are now generally regarded to have had adverse impacts on the environment (Bankoff 1995, 19–21). The late nineteenth century saw the commercialization of agriculture and changes in land ownership patterns that resulted in widespread tenancy as peasants were dispossessed of their fields and communal lands (Bankoff 1996; Larkin 1972, 53–54, 74–76, 211–13). The late twentieth century has seen the introduction of new land tenure arrangements intended to further hasten the commodification of land and its uses linked to global markets, which has further undermined the social reproduction of the rural labor force in the Philippines.

In Central and Southern Luzon and the Central and Eastern Visayas, there has been a constant struggle with the forces of nature and global capital to balance escalating production costs and tenancy arrangements against diminishing livelihoods. That the weather and climate should turn against these farmers with such venom is a blow from which many have found it increasingly difficult to recover, facing growing indebtedness and uncertainty

about their future on the land. Agriculture has reached a lamentable state in various parts of the country, and if these conditions of deprivation and social inequality continue to persist in certain areas of Southern Luzon, Negros, and Northern Mindanao there will be periodic starvation, if not famine.

However, it is also important to consider here why communities in the agricultural sector have not coped better than those in other sectors and to focus on the political, socioeconomic, and cultural factors that have prevented them from doing so. The Philippine government has not been able to regulate the power of elite landowners, transnational capital, and agribusiness in order to reorganize agricultural production on a more efficient and socially equitable basis. This stark political fact, in conjunction with shifts underway in the workings of the weather and climate—globally and locally—has recently caused some rural areas and agricultural-export zones to shift further in the direction of fundamental dependence and deprivation.

Between 1985 and 1995 neoliberal government plans for economic development and the “trickle-down” approach to alleviating class inequality promoted by the Ramos and Aquino administrations in the Philippines failed, with statistics indicating that about three fourths of the Filipino people still lived below the poverty line in 1994 (Kirk 1998, 215).

The Age-Old Variables: Politics and Cyclonic Storms

Philippine political leaders have long recognized that the workings of the climate and weather have affected the capacity of the population to develop colonial and postcolonial economic enterprises. Since the 1990s, however, some politicians and academics, often in opposition, have debated the economic and social implications of World Bank development prescriptions and recent changes to the workings of the weather and climate (Broad and Cavanagh 1993; Correa et al. 2011; Herath 1993; Uson 2014; World Bank IEG 2006). They have questioned what the future might hold for their developing country, confronting the possibility of an ecological crisis. In this fraught political context, a minority of politically powerful wealthy oligarchs and families, geographically dispersed across the archipelago, has continued to plunder the environment and thwart the efforts of concerned politicians and technocrats to eradicate poverty and improve public services, while also attempting to address the serious challenges posed by the weather and global climate change in this century (McCoy 1994; Vreeland et al. 1976, 216). The inability of the Philippine government to respond effectively to the

challenges of rural and urban social dislocation and capital flight continues to contribute to the growing poverty and social inequality in the archipelago. Farmers from some of the poorest regions in the country, because of the recent workings of the weather and climate, have been forced off the land (Hiepe and Ramasamy 2009; *Philippine Star* 2014; Niazi 2013; Walker 2014; Warren 2015). They have been compelled to migrate to the coasts and the equally difficult world of rapidly growing cities and urban social dislocation.

The Twenty-First Century: Global Climate Change and Extreme Weather

The Philippines has always been subject to climatic change and variability. What is unprecedented in the cultural-ecological history of the archipelago is the rate and possible extent of recent changes.

The Philippines ranked first as the most hazard-prone country in the twentieth century, with the scale of the physical destruction and loss of life dramatically increasing, especially since the 1970s. The increased rate of global warming over the past four decades has modified large-scale weather circulations that are responsible for the development, intensification, and movement of Philippine typhoons. The intensity of tropical cyclones has been greatly affected by the change of sea surface temperature over the Pacific Ocean (Xinhua News Agency 2003). Extreme typhoons, such as Haiyan, will become commonplace in the next several decades as the earth continues to warm. Calculations by climate experts at the Massachusetts Institute of Technology predict that the gradual warming of the earth over the next fifty years will heat ocean surfaces by four to five degrees—enough to raise typhoon wind speeds to 225 miles per hour (Seabrook 1989; Fagan 2008, 1–21; cf. Emanuel 2008). To further complicate matters, these more powerful typhoons will be occurring at a time when sea levels are rising due to the greenhouse effect. Higher sea levels will exacerbate the scale of destruction from storm surges in certain low-lying coastal areas of the Philippines (Bryson and Murray 1977, 153–56; Fagan 2000, xix). Cyclonic storms like Ondoy (Ketsana), Pablo (Bopha), and Yolanda (Haiyan) in the past two decades set records not only for their intensity and scale of physical destruction, they have also driven home the ecological realization that “modernity has yet to erase human vulnerability to nature” (Clancey 2003, 4). But nature and/or the growth of population are not the sole causes of the social inequality and environmental destruction. Human institutions,

particularly those linked to crony capitalism, are responsible. But up until now the political will to change things has not succeeded.

Tempestuous Weather and the Future of the Fundamentals of Life

The beginning of the twenty-first century finds the Philippines and its expanding population at a critical juncture in the nation's history. The current formidable political-ecological problems, many of whose origins can be traced back to previous centuries, namely, environmental degradation, recurrent economic and political crises, population growth, and extreme weather and climate change, could readily overwhelm the capacity of the government to respond effectively to the combined magnitude of such enormous challenges in the future. The wholesale clearing of tropical forests in the Philippines over the past two centuries has severely depleted one of the principal natural resources on which Filipinos depended for their lives and livelihoods. In the process they have been unwittingly destroying, in the prophetic words of Edward O. Wilson (cited in Klesius 2002, 114), "the natural economy on which the market economy depends." Many Filipinos can no longer depend on nature for ecosystem services to the same extent as in the past. The natural services provided by intact ecosystems that continue to be lost due to the scale of habitat destruction include "cleaning of air and water, partial climate regulation, making fertile soils, provision of habitat, and control of pests and pathogens," as Jane Lubchenco (cited in *ibid.*) states.

Ecosystem collapse has already dramatically affected regions in the Philippines, but in areas vulnerable to typhoons and floods it has been particularly acute. Land, water, and food sources are dwindling at an alarming rate, while more intense typhoons, floods, and landslides have developed with major weather and climate changes. Filipinos have changed the composition of the atmosphere, transformed the vegetation and landscape, and altered species' distribution and diversity. Human activity in the Philippines over the past five centuries has already pressed the limits of its natural systems.

Conclusion

Human beings make their environment and are simultaneously influenced by it. In reality, nature forms a part of the cultural ecological framework

of society, as is most evident in the use of natural resources for economic activity. Hazards are also intertwined with societal systems in affecting the socioeconomic pattern(s) and livelihoods among people (Blaikie et al. 1994, 46).

More recently, nongovernmental organizations (NGOs) have emerged to provide additional assistance and resources in response to major emergencies in typhoon affected areas. But Blaikie and his colleagues stress that regions like these cannot be made more secure by such assistance and local means alone. The long-standing ecological and social vulnerability of these areas suggests that the human environment cannot be made safe and secure until the limits prescribed by economic and social inequalities, cultural biases, and political injustices are redressed (*ibid.*, 219).

Thus far it has proved difficult, if not impossible, to effect a fundamental shift in economic and political policy in the Philippines because, as Jürgen Habermas notes, "the fortunes of the strong are so closely bound to the continuing misfortune of the powerless" (Goldblatt 1996, 192). However, as typhoon and flood events increase in intensity and scale, the power currently available to NGOs and the very poor to force the issues of ecocide and the impacts of extreme weather and climate change onto the mainstream, if not global, political agenda is increasing.

The Philippines and other Asian nations driven by rapacious policies and practices of mineral and resource exploitation and the imperatives of the market economy cannot afford to ignore these recent extreme storms and floods, except at their peril. E. O. Wilson (1999), one of the world's great living scientists, points out when the ecological costs of modern economics are apt to appear. A forest cut down for windfall capital will produce, in years to follow, major economic and social costs in the form of erosion, destruction of fertile fields, reduced rainfall, and calamity when a typhoon strikes (*ibid.*, 307–26). These ecological costs and the neglect of the "fragility of life" have rarely figured economically speaking in profit-and-loss balance sheets (*ibid.*, 306).

Eminent scientists like Wilson and Stephen Boyden have played pioneering, if not prophetic, roles in explaining the fundamental influences of natural and social environments on human well-being. Boyden (2004, 158–68) argues that a shift to an ecologically sustainable culture and equitable society in a country like the Philippines will not take place without a major transformation in the worldview and practice of the politically dominant minority. Wilson has stressed, in a powerful work of synthesis to unify the

major branches of knowledge, that the future of life, all life, depends upon a process of reiteration, namely, a choice to return to the natural balance and work with nature and each other. Making the needed changes through an ethic of sustainable development and reform of human institutions, in order to avoid the catastrophic risks of climate variability and extreme weather of the twenty-first century, in particular super typhoons, is the greatest challenge the Philippines has ever faced, if it is to improve the quality of life for all its people (Abramovitz 2001, 127).

Notes

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- 1 See the Philippine Atmospheric, Geophysical and Astronomical Service Administration (PAGASA n.d.) website for up-to-date, historical, and illustrated information on general weather, tropical cyclones, floods, climate, and regional forecasts. For a comprehensive earlier guide to the workings of Philippine tropical cyclones, see Froc 1920.
- 2 See also the important collection of essays devoted to the Braudelian sweep of Southeast Asian history in Henley and Schulte Nordholt 2015.
- 3 Super storms like Haiyan will continue to complicate the government’s current longer-term recovery process and safety concerns because many of the country’s communal typhoon shelters—schools, churches, and community centers—remain damaged or destroyed.
- 4 On gender and vulnerability, see Blaikie et al. 1994, 13, 24, 48, 53–55, 64, 89, 134; cf. Fordham 2004, 174–82.
- 5 Linda Newson’s (2009) *Conquest and Pestilence in the Early Spanish Philippines* points out that the sparse population of the archipelago prevented Old World diseases from becoming endemic in pre-Hispanic times. But she provocatively argues that the Filipino population suffered a serious decline by the mid-seventeenth century due to the demands for tribute, labor, and land. Rizal and others had argued this decline.

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Xinhua News Agency. 2003. Global warming does not intensify tropical cyclones, 1 Apr. Online, <http://www.china.org.cn/english/environment/60600.htm>, accessed 1 Apr. 2004.

James Francis Warren is emeritus professor of Southeast Asian Modern History, Asia Research Center, Murdoch University, Perth, Western Australia 6150. His current research focuses on slavery and the creation of transcultural identities and aspects of the environmental history of the Philippines and the Indian Ocean world. His most recent publications include *The Sulu Zone, the World Capitalist Economy and the Historical Imagination* (1998) and *Pirates, Prostitutes and Pullers: Explorations in the Ethno- and Social History of Southeast Asia* (2008). He is a recipient of the following awards: the Centenary Medal of Australia for service to Australian society and Humanities in the study of Ethnohistory (2003) and the Grant Goodman Prize in Historical Studies (2013). <J.Warren@murdoch.edu.au>