Uncertain Environments: Natural Hazards, Risks, and Insurance in Historical Perspective

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In recent years, the history of natural hazards and natural catastrophes has become a flourishing area of research. To date, most studies have focused on questions of perception, interpretation, coping strategies, and institutional change triggered by such events. Thus far, however, extreme natural events and the disasters they bring about have usually been treated as singular events, analytically isolated from long-term perspectives. By looking at problems of risk and uncertainty, this conference laid special emphasis upon natural hazards as a perennial threat, and on ongoing processes of encountering, defining, and adapting to risk. A critical innovation in this respect has been the development of insurance schemes. By converting natural processes into statistical formulae risk could be calculated and, at least theoretically, distributed over space and time.

Risk and uncertainty are both categories that can help us to understand how disasters and hazards have been perceived, classified, and managed over time. Uncertainty about environmental stability has compelled societies to develop strategies tailored to specific risks. Historically, national governments, social institutions, and local municipalities have sought ways to minimize the impact of future disasters. They have, for example, sponsored flood-control projects, introduced building codes for disaster-prone areas, developed emergency financial reserves, and devoted considerable funding and energy to programs designed to create public trust and confidence in face of potential disaster. Such programs have radically altered popular attitudes toward natural disasters. In fact, dam projects in hurricane-prone regions (such as New Orleans), and insurance programs (especially in the West) have shaped the development of many urban and rural areas. Above and beyond that scientific and cultural discourses and the role that „natural" disasters played in them – whether seen as „freak events" or rationalized into (seemingly) predictable data – have defined and re-defined social constructions of „uncertain", „risky" and „uncontrolled" as well as „stable", „livable" or even „understandable" environments.

This conference took a comparative look at different „cultures of risk" across the globe. Most participants focused on the modern period, when the destructive potential of natural forces has reached new heights due to the steadily increasing entangling of the environment in the infrastructure of human activity.

In the first paper of the conference, GREG BANKOFF highlighted the importance of social capital in coping with disaster. Looking at poor rural communities in the disaster-stricken Philippines over the past three centuries, Bankoff discovered a plethora of community organizations and networks that have functioned as a kind of social insurance in times of emergency. Although most often not explicitly founded to deal with the consequences of disaster, organizations such as rotating credit associations, cooperative societies or religious fraternities (*cofradias*) offered aid to members affected by floods, droughts, earthquakes, or other natural catastrophes. The frequent and intense exposure of many Filipinos to such hazards, Bankoff argued, has promoted community welfare and encouraged different forms of mutual assistance and reciprocal labor. Thus it is not surprising that the most hazard-prone areas in the Philippines also had the largest number of mutual-aid associations.

A different „risk society" was described by JOANNA DYL in her paper on the 1906 San Francisco earthquake and fire. Dyl showed how nineteenth-century transformations of the urban environment promoted patterns of vulnerability that led directly to the loss of many lives and to the widespread destruction that followed the quake. Filling in coastal areas and waterways to create new land and constructing a high percentage of buildings out of wood, she pointed out, established the conditions for disaster. At the same time, Dyl em-

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phasized the importance of contingency and warned of the dangers inherent in framing the histories of natural hazards and catastrophes as teleological narratives. How differently might the city of San Francisco have evolved, she asked, if the northern segment of the San Andreas Fault had remained inactive until earthquakes in other parts of California had prompted precautionary measures?

Two presenters addressed the important role of institutions in the history of disaster and risk management. ANNE-MARIE GRANET-ABISSET described the evolution of the „Pôle Grenoblois sur les Risques Naturels" (PGRN), a large research center in the French Alps devoted to the study of natural hazards. Founded in 1988 in a city that frequently experiences extreme natural events, the PGRN cooperates closely with local politicians and has increasingly integrated social-science perspectives as well as cultural analyses into its activities. MARIAN MOSER JONES, in her study of race and class disparities in nineteenth-century disaster relief, compared the relief efforts of the American Red Cross after the Johnstown flood in 1889 and after the Sea Islands Hurricane in South Carolina four years later. In Johnstown, Pennsylvania, over 20 million tons of water rushed down the Conemaugh valley and into the city on May 31, after a vast earthen dam collapsed, causing the deaths of more than 2,000 people. The Red Cross provided 39,000 dollars in cash donations and 211,000 dollars in supplies; it built temporary lodgings for more than a hundred families; and, among many other things, it furnished survivors with food, clothing, and shelter. In a stark contrast to the aftermath of the Johnstown flood, the Sea Islands hurricane of 1893 received only scant coverage in national newspapers, which resulted in much smaller donations from the public, only 30,000 dollars. Of the more than six hundred people who died and approximately 30,000 who were driven from their homes, the great majority were African-Americans. The Red Cross reacted more slowly than it had four years before and in many instances displayed paternalistic behavior toward the victims of this disaster. Still, it was the only relief organization to offer assistance in the devastated area, and it filled a vacuum created by the lack of governmental relief efforts.

Science, like institutions, had a major impact on the way societies dealt with environmental hazards and risks. Focusing on the discipline of seismology around 1900, ANDREA WESTERMANN illuminated the process by which tectonic activity was converted into a continuous seismic record by a global network of observers collecting, comparing, and interpreting data. For those immediately affected, however, earthquakes trigger a fundamental experience of uncertainty, as Alexander von Humboldt noted in this well-known passage: „When … we suddenly feel the ground move beneath us, a mysterious and natural force, with which we are previously unacquainted, is revealed to us as an active disturbance of stability. A moment destroys the illusion of a whole life. Our deceptive faith in the repose of nature vanishes." Seismologists at the turn of the century took a totally different view of these events. By emphasizing the normal character of earthquakes, these experts dissociated them from their uncertain and catastrophic aspects. At the same time, instrument-based seismology also served to turn hazards into risk, at least in particularly vulnerable regions such as California.

Even more challenging than predicting earthquakes is predicting the weather, as JAMIE PIETRUSKA demonstrated in her paper on the U.S. Weather Bureau's struggle with long-range weather prophets in the early twentieth century. Originally, the Weather Bureau shied away from long-term predictions since, in its reinvention of weather forecasting as a modern scientific practice, it deemed such undertakings a hallmark of meteorological amateurism if not outright quackery. In addition, due to their alleged inaccuracy, the Bureau regarded long-range forecasts, especially those of extreme events such as storms, floods, or droughts, as a threat to agriculture, industry, and commerce. Long-range weather forecasters, on the other hand, constantly challenged the Weather Bureau—not only with their predictions but also with their methods. They employed planetary meteorology and periodicity as well as lunar phases. Furthermore, looking at the behavior and special conditions of animals was a central part of verna-

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cular forecasting traditions. Cries of yellow-billed cuckoos, the coloring of caterpillars in late fall, or the shadow of the famous groundhog all served the weather prophets in making predictions. With the issuance of its own weekly forecast in 1908, however, the Weather Bureau accepted uncertainty as a key element of long-range weather forecasting.

Environmental risk can also be the unintended result of human intervention into nature, as SAM TEMPLE explained in his paper on the *Landes de Gascogne*. Originally a moorland supporting a sparse, agro-pastoral society, the region was transformed into an engineered landscape by an intense program of pine forestation. The maritime pine not only yielded large profits but also became an agent of change and modernization in an area that had formerly been regarded as a backward and unhealthy wasteland. The monocultural region was plagued, however, by recurrent and disastrous fires, and by the middle of the twentieth century, almost half of the forest had been destroyed and with it the hopes for a better future.

Just as representations of the *Landes* as a wasteland served to justify state intervention and the massive forestation program, floods and droughts along the St. Francis River in Quebec during the first half of the twentieth century were used to legitimize river regulation, mostly for industrial purposes. Until then, as STÉPHANE CASTONGUAY has shown, inhabitants of local towns and villages displayed a remarkable culture of risk. During times of flood, personal belongings were moved to the upper stories, merchants temporarily emptied their basements, and canoes were used to visit neighbors. Floods were a part of the identity of this riverine society, and local hydrological knowledge, while not foolproof, was relatively reliable in predicting the next rise. With the construction of several dams and flood walls to regulate the river flow and to protect communities from inundations, people ceased to be accustomed to floods. The river was not only materially transformed but also discursively reconstructed as floods ceased to be regarded as a normal part of the hydrological cycle and were viewed instead as catastrophic events. Vulnerability was literally built into the landscape.

Dams and the artificial landscapes they create can be seen as the epitome of „uncertain environments." The earthen or concrete walls designed to dam a river signify the power inherent in natural processes as well as its destructive potential. In her paper on the „Visible and Concealed Spaces of the Aswan High Dam," ELIZABETH BISHOP showed how the level of risk to which laborers were exposed during construction of the dam, especially the six tunnels that run through it, corresponded to their gender as well as their citizenship status in postcolonial Egypt.

DOROTHEE BRANTZ described a different kind of modern vulnerability in her paper on the unintended consequences of epizootics, i.e. the nonhuman equivalent of epidemics. She looked at the risks and hazards posed by livestock diseases in eighteenth and nineteenth-century France and Germany, focusing on the history of *Rinderpest* (cattle plague), which killed more than 200 million cattle in eighteenth-century Europe. Brantz identified several human activities that contributed to the spread of the disease such as war, the transportation of cattle by rail, and the centralization of slaughter. She also highlighted different strategies of containment. Indemnities, for example, were paid to farmers in order to prevent them from selling infected cattle or their hides and to accelerate the rebuilding of healthy herds. Other strategies included disinfection, quarantine or *cordon sanitaire*, and vaccination as forms of biological insurance. The most common method of containing the disease was, however, the large-scale culling of both infected and healthy animals and the destruction of their cadavers. Despite all these measures, contagious livestock diseases remained a hazard beyond human control. Brantz concluded that the struggle against epizootics exemplifies the integration of risk into modern society.

With the rapid growth of trade, industrialization, urbanization, and globalization, modern societies were compelled to address the increasingly complex financial implications of environmental hazards and disasters. In France, a new understanding of risk evolved during the seventeenth and eighteenth centuries. The old system of royal favors and pub-

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lic charity in times of emergency that had favored the poorest parts of the population was gradually supplanted by a scheme of compensation based not on need but on actual losses sustained, as RENÉ FAVIER clearly showed in his presentation.

The final five papers of the conference discussed insurance as an innovative device for distributing the risks of natural hazards over time and space. GUIDO POLIWODA outlined his research on financial mitigation of severe floods and winter storms over the twentieth century, focusing especially on Switzerland, Saxony, and North Rhine-Westphalia. While the Swiss succeeded in establishing a mandatory, government-subsidized insurance scheme that covered all types of hazards, most German attempts to create insurance against natural hazards failed. Victims of floods and storms must still rely on the state or private charity for relief and compensation. FRANK OBERHOLZNER traced the history of crop insurance in Germany, where insurance against agricultural catastrophes was uncommon before the nineteenth century. Lack of capital, religious constraints, and a dearth of precise data inhibited the development of crop insurance in the early modern era, but as Enlightenment ideas and attitudes gained ground, the perception of natural hazards changed. No longer regarded as divine retribution, thunderstorms, floods, and crop-destroying hailstorms were recognized as natural processes that were susceptible to human intervention. Furthermore, rapid population growth in Germany led to higher prices for agricultural land and products, which made protective measures more desirable. Despite some early failures, crop insurance turned out to be a success. The value of insured crops rose from 215 million marks in 1844 to 3.5 billion marks in 1913. Crop insurance remains the most important protection farmers have against the vagaries of the weather.

In a co-authored paper, ELEONORA ROHLAND and FRANZ MAUELSHAGEN introduced a model to explain the transformation of risk between policyholders and insurers. Rohland and Mauelshagen distinguished between what they called „first-order," „second-order," and „third-order" risks of policyholders, insurers, and reinsurers. In the theoretical part of their paper they argued that the term *vulnerability*, which has emerged as a key concept in the field of disaster studies, should also be applied to the insurance markets and industries, as these enterprises are in many ways equally vulnerable (in an economic and institutional sense) to disaster and natural hazards. In a case study that looked at fire insurance and reinsurance of Swedish cities, where the most common building material was wood, Eleonora Rohland discussed the material and cultural constructions of fire hazards in Sweden. While urban fires were not as frequent as one might assume, the devastating fire that burned down large parts of Sundsvall and the simultaneous occurrence of a fire in the city of Umeå led to the renegotiation of insurance terms and ultimately to the redefinition of fire risk in Sweden in 1888. Furthermore, insurers and reinsurers exerted their influence by lobbying for the reconstruction of Sundsvall in stone rather than wood. In a second case study that looked at the „unpredictability of hail" and the role of reinsurers in Switzerland, Franz Mauelshagen elaborated upon the important environmental, economic, and financial consequences of hail storms. His paper focused on how the Swiss Reinsurance Company adopted hail insurance largely as a concession to the fire insurance industry. Mauelshagen not only discussed expectations from peasants in different parts of Switzerland and the problems of establishing state versus private hail insurance; in reviewing the complicated negotiations between insurers and re-insurers, he also explored the critical role played by political and economic calculations as well as specific economic losses (following natural disasters) in reinsurers' decision both to sign contracts with insurers and to terminate such agreements.

Finally, PETE KAKEL presented a comparative study of the impact on the global insurance and reinsurance industries of two major catastrophic events: the San Francisco earthquake and fire in 1906 and Hurricane Katrina in 2005. Kakel observed that both of these events challenged existing perceptions of risk, generated new scientific research, and accelerated the development of enhanced insurance and risk-finance techniques. According to Kakel,

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these two disasters have served as catalysts for major changes in the global (re)insurance industry.

In the closing discussion the two conveners, UWE LUEBKEN and CHRISTOF MAUCH, offered some reflections on the cultural, social, and historical construction of risk. The massive human interventions into the environment that have accompanied the processes of industrialization, urbanization, and commercialization have also created new patterns of risk and vulnerability. With natural processes allegedly under control, an attitude of denial and of obliviousness toward natural hazards has become more and more widespread over the course of the twentieth century. This is also an outcome of the important role that science has played and still plays in predicting extreme natural events and thereby in redefining risk. Furthermore, the role of federal governments in sharing risks and in compensating for losses has steadily increased. Risk, hazards, and disasters, as well as our collective responses to these phenomena, have shaped our social institutions and determined our belief systems; and they will continue to do so as long as we inhabit a world of uncertain environments.

Conference Overview:

I. Risk Societies
Greg Bankoff (University of Hull): Living With Uncertainty, Coping With Risk: Social Capital and the Origins of Community Resilience in the Philippines
Joanna Dyl (University of South Florida - Tampa): Risk, Uncertainty, and Teleology: Writing the History of Natural Disasters

II. Institutional Risk Management
Marion Moser Jones (Columbia University): The Red Cross in Black and White: A Comparative Case Study of Race and Class Disparities in Nineteenth-Century Disaster Relief
Anne Marie Granet-Abisset (Pierre Mendés France University, Grenoble): Foreseeing the Unpredictable and Managing Natural Disasters: The Role of a Current French Institution (PRGRN)

III. Science and the Rationalization of Uncertainty
Andrea Westermann (ETH Zurich): Disciplining Global Earth: The Organization of Seismological Observation around 1900
Jamie L. Pietruska (Massachusetts Institute of Technology): The U.S. Weather Bureau, Long-Range Weather Prophets, and the Rationalization of Uncertainty in the Early Twentieth Century

IV. Controlling Nature and the Nature of Control
Sam Temple (University of Michigan – Ann Arbor): From Southern Wasteland to National Woodland: Marginality, Risk, and the Politics of Nature in the Invention of the 'Landes des Gascogne'
Elizabeth Bishop (University of Algiers): Control Room: Visible and Concealed Spaces of the Aswan High Dam"

V. Gauging Vulnerability: Flood and Disease
Dorothee Brantz (TU Berlin): Risky Business: Disease, Disaster and the Unintended. Consequences of Epizootics in Eighteenth and Nineteenth-Century Germany and France
Stéphane Castonguay (University of Québec): Framing Floods as Disasters: Vulnerability and Vigilance along the St. Francis River (Quebec), 1903-1948

VI. Risk and Financial Mitigation
René Favier (Pierre Mendés France University, Grenoble): „From Charity to Compensation: Aid to the Victims of Natural Disasters in Ancien Regime France"
Guido Poliwoda (University of Bern): Gimme Shelter: Financial Mitigation of Severe Floods and Winter Storms in Switzerland and Germany, 1910-2005

VII. The Business of Risk: Natural Hazard Insurance
Frank Oberholzner (University of Munich): From a Scourge of God to an Insurable Risk: The Establishment of German Crop Insurance.
Pete Kakel (University of London): Natural Catastrophe Events in Historical Perspective: The 1906 San Francisco Earthquake and Hurricane Katrina
Nora Rohland (University of Bern) and Franz Mauelshagen (University of Zurich):
Fire and Ice: Risk Management and Reinsurance—Two Case Studies

Tagungsbericht *Uncertain Environments: Na-*

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