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The Sky Is Falling:
Risk, Safety, and the Avian Flu

In the familiar children's story, Chicken-licken turns the occurrence of an acorn falling on her head into global catastrophe, spreading fear one by one among her friends by cackling, "The sky is falling!" Among the many species that figure in this story—chickens and turkeys, geese and ducks—there is also one sly fox. Though we may be less familiar with this part of the story, it is Fox-lox who causes the *real* trouble, not the various fowl and waterfowl, or the acorn. When the birds come across him in the woods as they are going to the king, he offers to act as their guide: "And Fox-lox said, 'Come along with me and I will show you the way.' But Fox-lox took them into the fox's hole, and he and his young ones soon ate up poor Chicken-licken, Henny-penny, Cocky-locky, Ducky-lucky, Draky-laky, Goosey-loosey, Gander-lander, and Turkey-lurkey, and they never saw the king to tell him that the sky had fallen!"¹

I take this tale as my point of engagement with the questions of risk, safety, and the avian flu because this far-from-expert little narrative has access to elements of human awareness—call it folk wisdom, if you will, of the Richard Hoggart or Raymond Williams variety²—that have been lost in the haze of agricultural and medical sci-

entificity. This story asks us to consider what constitutes risk, where risk comes from, and who is authorized to define, manage, and respond to it, as well as what constitutes safety, where we can find it, and what bargains we make in search of it. The bare bones of the Chicken-licken story sound remarkably like current news reports about avian flu: farm fowl and waterfowl generating a panic that seems to require government intervention, while experts plan a response and Fox (which includes Fox-fox and Fox TV, as well as CNN and the like) disseminates it, thus both defining and managing the crisis.

A similar version of what constitutes both risk and safety circulates through the media and in government documents dealing with our contemporary avian flu crisis. The Centers for Disease Control and Prevention (CDC) perpetuates the discourse of risk and safety when it offers its own version of the Chicken-licken story: "Avian influenza is very contagious among birds and can make some domesticated birds, including chickens, ducks, and turkeys, very sick and kill them. . . . If H5N1 virus were to gain the capacity to spread easily from person to person, an influenza pandemic . . . could begin. . . . experts from around the world . . . are preparing for the possibility that the virus may begin to spread more easily and widely from person to person."³ Like Chicken-licken, when faced with the risk of avian flu, U.S. citizens allow the government and the media to define the risks the nation faces—wild birds and backyard chickens rather than the dangers of the global poultry industry—and imagine that American safety lies in expert guidance. Moreover, another form of awareness is generated by the expert discourses around H5N1, the highly pathogenic avian flu, as discourses of race, economics, and nationality converge to frame the meanings of risk and safety. Here paraliterature—both the satiric popular press and the "airport paperback categories of the gothic and the romance, the popular biography, the murder mystery and the science fiction or fantasy novel"⁴—nails it, as demonstrated in an interview provided by the satiric newspaper the *Onion*: "So, basically, the CDC doesn't have the first inkling of what to do about a potentially explosive form of flu that infects ducks and chickens," said Fox News Science, Health, and Epidemics Commentator Marylinne Kent. "Given the popularity of these two birds as a food source among Asians, and the fact that we have no idea how many undocumented Asians have settled illegally in our nation, the potential for danger is extremely high."⁵ As the children's fable and satire both reveal, expert knowledge about the production of life frequently functions not to inform

but to obscure. While this has been given ample demonstration in relation to contemporary biomedicine, it is also the case, as I will argue, with the converging expert discourses that construct what risk and safety mean in terms of H₅N₁. Risk, in this instance, is further heightened by Fox's racialized presentation. Not only is the other baldly incriminated, the other is also rendered more dangerous by the fact that the (Asian) other is the illegal source of the epidemic. The health of the nation is endangered by criminality of those who cannot be accounted for or traced.

As Ulrich Beck specifies, "*Risk may be defined as a systematic way of dealing with hazards and insecurities induced and introduced by modernization itself*"⁶ (a process that of course also involves the "hazards and insecurities" of—illegal—immigration). Risk in Beck's analysis is *reflexive*, a source of ever more economic productivity as it mandates increasing expert knowledge, rationalization, and surveillance. Crucially, risk is also a source of what Beck calls unawareness (including unawareness of the life circumstances of other alien bodies), a systematic production of ignorance that operates by defining knowledge more and more narrowly as the product of scientifically mediated institutions, so that laypeople are no longer confident about the wide range of commonsense, tacit, everyday knowledge available.⁷ The impact of risk may be imagined in global terms (aligning with the expert analyses of global corporations), but in reality risk has an unevenly distributed global impact. It exacerbates old inequities while producing new ones such as the devastating financial losses faced by small chicken farmers when an outbreak of avian influenza in high-density poultry farms leads to a forced cull of outdoor birds or the increased rate of assembly-line injuries suffered by poultry workers when a global dip in chicken prices leads to a speed-up on the production floor. We are promised (false) security—healthy food—in exchange for surrendering our abilities to seek out the wider range of alternative analyses and responses such as those forms of knowledge either unknown to or not sanctioned by the CDC.

Safety discourse enforces hegemonic scientific rationality, structuring what we come to think of as a state of security or freedom from hazards and insecurities; it defines the authoritative measurements of the economic and social costs of achieving such security; it authorizes expert knowledge (and in turn creates the benchmarks for such authorization); and most important, it creates a particular form of unawareness on which this whole discursive apparatus of safety relies. This "double construction of unawareness" includes both the obstruction and rejection of other forms

of knowledge and the “denial of our inability to know.”⁸ To invoke Donald Rumsfeld: *We don’t know what we don’t know*. Because we focus on scientifically defined risks and technologically mediated solutions, we are unable to grasp aspects of experience not subject to quantification. Because we are focused on increasing the biosecurity of existing poultry production units, we do not even consider the broader social, biomedical, and cultural consequences of raising genetically similar chickens in the stressful conditions of overcrowded, confined poultry houses. “The Story of Chicken-Licken” and the *Onion* news report both reveal the systematic process of producing unawareness that plays an essential part of the reframing of risk and safety accomplished by industrial poultry production.

Part of the process of rearticulating risk is repressing from public memory the fact that low pathogen avian influenza has been around for centuries, finding its historical reservoir in the bodies of wild waterfowl and making occasional forays into flocks of chickens or turkeys, such as the eruption of H5N2 virus in Pennsylvania poultry farms in 1983.⁹ There was some significant consensus that the 1918 human influenza epidemic had a porcine source. Even as early as 1919, an investigator for the U.S. Bureau of Animal Industry named J. S. Koen published an article in the *American Journal of Veterinary Medicine* arguing, “[The] similarity of the epidemic among people and the epidemic among pigs . . . [suggested] a close relation between the two conditions for the 1918 [epidemic].”¹⁰ Since such a claim had its own economic risks to the growing pork industry, there were strong disincentives to explore the possibility of a transspecies transmission of avian flu from pigs to chickens to humans. There is, then, nothing new about avian flu. The pathogen has been with us for years—only the context has changed.

However, the entire history of the disease was reframed when a highly contagious and very lethal strain of this virus emerged in Hong Kong in 1997, gaining widespread media attention. This new variety not only killed chickens, but it made the transspecies jump to human beings, killing three-year-old Lam Hoi-Kaw in May 1997 (*Bird Flu*, 32). The Hong Kong outbreak was eradicated by a systematic slaughter of more than one million chickens, applauded in 1998 by a joint proclamation signed not only by scientist experts on the influenza virus but by the World Health Organization, acknowledging, “We may owe our very lives to their actions” (*Bird Flu*, 37). In 2004, another virulent outbreak of H5N1 avian flu spread across Southeast Asia, and the alarm generated by this outbreak triggered a media panic.

Stefan Lovgren's 2004 story in the online *National Geographic News* exemplifies this journalistic hysteria. Lovgren breathlessly reports that the virus was spreading not just from person to person but from species to species: "This year there have been 44 confirmed human cases of H5N1 flu in Thailand and Vietnam. Of these, 32 people died. There is not yet a vaccine for the disease. . . . Meanwhile the virus has undergone huge genetic changes and become even more pathogenic. It now affects not only birds, but also cats, pigs, and even tigers."¹¹ The *National Geographic News* article is a masterpiece of doublespeak. The author gives ample space to the alarming announcement of Shigeru Omi of the WHO that avian flu death estimates "of 2–7 million deaths were 'conservative' and that the maximum range could go as high as 50 million deaths." Then he reports wryly, almost regretfully, that despite these grim predictions, "the one thing that did not break out was mass panic." The journalist's nose for news seems to be sniffing hard, indeed, wishing for a good outbreak of public hysteria to document for his readers. He cites a comment from UCLA virologist Michael Lai, "This alarmist warning is irresponsible in using this language to rouse the public's fear," but gives Dick Thompson, a WHO official in Geneva, Switzerland, the last word: "'Are we scaring people? I don't know,' he said. 'But rather than springing on people some terrible event, it's better that they get emotionally ready for what they could face. We think a pandemic is coming. Nobody knows when. But it is good to get people prepared before it arrives.'" True to its orientalist heritage even in its title, Lovgren's piece, "Is Asian Bird Flu the Next Pandemic?" adopts the persistent racializing misnomer—the "Asian bird flu"—thus contributing to the racially inflected and pathologizing anti-immigration discourse swirling around the disease.

That highly pathogenic avian influenza could jump from an avian species to humans, so that the disease could then be spread directly from person to person the way conventional influenza does, was generally dismissed until 2005. Then, a team led by pathologist Jeffrey Taubenberger and including scientists from the CDC and New York's Mount Sinai Hospital sequenced the influenza virus contained in tissue samples of victims of the 1918 influenza that had been preserved in Alaskan permafrost.¹² In a 2005 *Nature* essay, the team announced: "Here we present sequence and phylogenetic analyses of the complete genome of the 1918 influenza virus, and propose that the 1918 virus was not a reassortant virus (like those of the 1957 and 1968 pandemics), but more likely an entirely avian-like virus that adapted to humans. These data support prior phylogenetic studies suggesting that

the 1918 virus was derived from an avian source.”¹³ Folk wisdom had registered awareness that would remain inaccessible to science for years: “Back in 1918, schoolchildren jumped rope to a morbid little rhyme: ‘I had a little bird, / Its name was Enza. / I opened the window, / And in-flu-enza’” (*Bird Flu*, 13).

Taubenberger’s study, and one that followed it in *Science* in 2005, by Terrence Tumpey and others at the CDC, raised public fears not only because of the fatal conclusion but because of the methodology the researchers had used.¹⁴ Both research groups had re-created a strain of the virus from RNA fragments preserved by the permafrost and published the full genome sequence of the virus on the GenBank database. This material was now open access, according to Jonathan Tucker of the Center for Nonproliferation Studies: “If someone wants to reconstruct the virus, says Taubenberger, ‘the technology is available.’”¹⁵

While in 2004 former U.S. secretary of Health and Human Services Tommy Thompson described avian flu as more of a threat than bioterrorism, within a year the two threats merged, as the oversight responsibility of the National Science Advisory Board led it to define nature itself as a bioterrorist threatening the nation. The United States National Science Advisory Board for Biosecurity convened a special meeting upon publication of Taubenberger’s article. While it concluded that the benefits of such research “clearly outweigh the risks,” it requested that Taubenberger and his fellow researchers add a passage to the manuscript stating that the work is important for public health and was conducted safely.¹⁶ However, as Andreas von Bubnoff observed in *Nature*: “Taubenberger admits that there can be no absolute guarantee of safety. ‘We are aware that all technological advances could be misused,’ he says. ‘But what we are trying to understand is what happened in nature and how to prevent another pandemic. In this case, nature is the bioterrorist.’”¹⁷ Taubenberger’s recourse to the ready-to-hand rhetoric of terrorism, so constitutive of all U.S. discourse since 9/11, in response to criticism that his research methods are unsafe reveals the constructed nature of the concept of “safety,” shaped as it is by multiple extrascientific factors.

Chief among these factors, of course, is the economic bottom line. In the decade of pandemic hysteria since 1997, the avian flu publishing industry has boomed. Local and national government agencies including the Food and Drug Administration, the USDA, and the CDC have issued warnings and informational pronouncements, and on May 9, 2006, ABC aired the made-for-TV movie *Fatal Contact: Bird Flu in America*.¹⁸ The boundaries

of fact and fiction blurred as this movie was the subject of analysis by the Department of Health and Human Services on a government Web site with the same title, "Bird Flu in America."¹⁹ Clearly, avian flu also provides the opportunity for profit for businesses, the media, and even government institutions. This is amply demonstrated by one recent example: the Fifth International Bird Flu Summit held in September 2007 in Las Vegas. This conference brought "distinguished scientists, international health organizations and world leaders" together with "heads of the world's top companies to discuss how the world can survive an imminent pandemic."²⁰ In addition to keynote speeches by experts, there were breakout sessions exploring "Business Continuity Planning," "Emergency Management Services," "First Responders Law Enforcement/Police Department/Public Works," as well as the customary exhibition hall with its range of pharmaceutical, technological, and genomic offerings. All this was available to conference participants for the "super early bird" rate of \$1,850. Well worth it, if we can judge from the New Fields conference Web page, where glowing testimonials from representatives of the United Nations, the U.S. Army, the U.S. Department of Defense, and the USDA, as well as academics, jostle with those from representatives of Dow Biocides, F. Hoffman-La Roche AG, the U.S. Department of Homeland Security, Karl Hans-Fuchs Collective Protection Engineering, and the European Influenza Surveillance Scheme.²¹

The *Chicken in Chicken-Licken*

However, any discussion of the "monster at our door"—as Mike Davis has dubbed it with noir irony²²—must begin with something more prosaic and less media friendly: the transformation of chicken farming in the United States since 1900. Before the consolidation of industrial poultry farming in 1932 with the formation of the Institute of American Poultry Industries, most chickens were raised in the farmyard or the garden. In the preindustrial era, the meaning of risk in any agricultural context was straightforward: the livestock could die, leaving the farmer with no animals to sell for meat. Even in chicken farming, the risk that chickens might stop laying or might die threatened the extra income generated by the backyard flock. Safety, too, was easy to define: it referred to the chicken's state of freedom from predators, access to sufficient food and water, and the farmer's possession of adequate production and distribution avenues to generate adequate income from the chickens. Such safety depended on the individual

chicken farmer's skill in managing the health and productivity of her layers and meat birds, as well as business sense—good poultry husbandry, in short. The curiously outdated term is significant: farmhouse-based chicken raising characteristic of the United States in the early to mid-twentieth century was a deeply gendered activity. Most chicken farmers were women, and the backyard flock was typically the responsibility of the farm wife or daughters, who managed the flock's illnesses with medical practices traded from farm to farm. Chickens insulated farmers against economic losses caused by crop failures or other livestock losses, providing eggs and meat for the family table as well as supplying the farm women with precious "egg money" kept separate from the main sources of farm income.²³ For farmers, sharing veterinary advice with one another was a very simple strategy of communal risk management and economic survival.

Just about the time the term *animal husbandry* entered the lexicon, around 1915 to 1920, this reliance on nonexpert or folk wisdom in chicken raising and doctoring began to change, reflecting (in part) the influence of an English-born veterinarian named Joseph Edward Salsbury.²⁴ "Doc" Salsbury professionalized chicken medicine, radically transforming chicken farming in the process. He provided veterinary advice and mail-order patent poultry medicines. Moreover, he sold his services as a "specialist on poultry diseases" (*API*, 63). He began offering annual poultry short courses to the general farming public. The first one, held on October 12–21, 1931, combined morning talks on specific diseases by well-known speakers with afternoon sessions covering laboratory work and clinical medicine. The no-fee courses attracted leaders in poultry farming, poultry specialists, and poultry supply dealers. By midcentury, more than 10,000 people had attended the "Dr. Salsbury poultry disease schools." "These men, to a very large degree, represented the basic school of knowledge which would help lead the commercial poultry industry into being" (*API*, 64). Certainly there might have been a woman or two who attended the short courses, but given the fact that they began as invitation-only events and expanded from that to the foundation of the poultry industry, the attendance at these short courses was overwhelmingly male. Salsbury's system for research, marketing, and educational consultation not only paved the way for the academic field of poultry science, but it also anticipated the growth of poultry raising as a profit center linking the vertically integrated poultry industry (that is, one that goes from incubation to processing) to pharmaceutical companies specializing in poultry medicine.

As Salsbury's veterinary business was growing in the early twentieth century, land grant colleges in the United States were making poultry education part of their curricula. In 1902, the University of Connecticut led the way in the establishment of poultry science departments, followed by universities in such recognized chicken farming states as New York (1907), Washington (1918), Massachusetts (1920), Indiana and Michigan (1921), and Pennsylvania and North Carolina (1924).²⁵ Educators and extension educators began systematizing the practices of men involved in breeding, farming, and exhibiting, like Joseph McKeen of Omro, Wisconsin, who developed the Buff Wyandotte variety; Joseph Wilson, who pioneered shipping day-old baby chicks; and Isaac K. Felch, "credited as being the first poultry judge to make his entire living from the poultry industry."²⁶

Animal husbandry was starting to become a masculine field. No longer were women the primary chicken farmers, keeping their chickens healthy with home remedies. Chicken raising had been gendered female, but that era was coming to an end, as anthropologist Deborah Fink learned in her ethnographic study of an Iowa region she called "Open Country": "So completely were chickens associated with women that older Open Country people frequently categorized chicken chores as housework."²⁷ The extension educators of the interwar era who hoped to turn poultry raising into a scientific practice suitable for the modern male farmer faced a challenge. Fink points out, "Chickens were the classic bane of men, but this did not keep them from being the most common enterprise on pre-World War II Iowa farms."²⁸ Before 1940, despite the attempts to redefine poultry keeping as a masculine activity (such as the male-dominated poultry classes of Salsbury and the male orientation of emerging poultry departments), the keeping of chickens had a lingering image as a trivial, because feminized, occupation. But with the rise of agricultural extension education, chicken farming became a male activity. According to Fink: "American women's exclusion from egg and poultry production resulted from a conscious policy decision on the part of agricultural program planners. . . . Rather than encouraging and sheltering women's poultry production, the postwar extension service ceased to include women . . . unless their husbands were also participants."²⁹ The new academic field of poultry science linked research in basic sciences with applied research on poultry production and management, producing (predominantly male) avian scientists and managers for the growing poultry industry. As the ownership of the industry was consolidated in larger and larger corporations, class differen-

tiation joined gender sorting, since the poultry workers for this new industry not only were frequently female, but were recruited from poor, disenfranchised migrant and immigrant populations.³⁰

As the industry increasingly turned to technological innovations to manage the risks of poultry production, technologically mediated definitions of risk and safety resulted. This was certainly the case with incubation. Although it was one of the oldest technical interventions in chicken raising—a practice dating back to the ancient Egyptian practice of incubating chickens in large clay rooms heated with manure-fired ovens—the introduction of an electrically heated mass incubator in 1923, developed by Ira M. Petersime, launched a debate about the ethics and effectiveness of such practices (*API*, 26). Traditional poultry breeders argued that it was “morally wrong to hatch chicks artificially” (*API*, 27). The American Poultry Association, formed in 1873, itself joined the debate, waging a campaign that “set out methodically to tell the American farmer the quality of artificially incubated chicks was inferior, and that it would be impossible to transport them successfully” (*API*, 27). However, breeders who were selling these new “artificial chicks” countered the association by marketing their product as more scientifically advanced and thus better.

By 1916, when the American Poultry Association gave way to the new International Baby Chick Association, scientific rationality and industrial efficiency had prevailed. In March 1918, the International Baby Chick Association convinced the U.S. Post Office to allow trial shipping of baby chicks via parcel post. This trial was such a success that by the following October the new mode of distribution was permanent.³¹ Chicks could now be mass incubated and delivered to customers via the U.S. mail. One of the many contemporary handbooks on poultry raising, *Making Money from Hens* (1919), characterized the result as a safer and more effective means of distinctly American chicken production:

The development of manufacturing enterprise, coupled with our Yankee inventive genius, conceived and rapidly developed the efficient artificial incubators we know to-day, until at the present time they are far superior to the hen, in that they hatch better. . . . with incubators the time of hatching is not subject to the whims of the hen, but is absolutely under the control of the efficient poultryman.

Chicks artificially hatched and reared are not subject to the parasites and disease contamination they are bound to contract to a greater or less extent when running with hens.³²

The discourse of risk folds almost seamlessly into the discourse of safety, inflected with gender and nationalism even at this early stage in the industry's development. The risk of a poor hatch ratio is countered by the safety provided by the efficient Yankee incubator, just as the risk of exposure to parasites and disease is mitigated by keeping the artificially hatched chick indoors. Thus, closed in, under the control of the efficient "poultryman," the chick is safe from even the small degree of danger it would encounter "running with hens."³³ The rhetorical redefinition arrests in medias res the transition from backyard to industrial poultry farming: the hen-and-nest method of chicken incubation and growth is redefined as risky (unsanitary and uncontrolled) while the artificial incubator and confined growth are defined as safe. Moreover, safety becomes technologized, medicalized, racialized, and nationalized: it is conceived of as freedom from disease and parasites associated with foreign exposure, available to chicken raisers thanks to "Yankee inventive genius."

By the time of World War II, these new technologies and modes of expert knowledge had solidified into what Deborah Fitzgerald has described as the ideal of industrial agriculture, characterized by "timeliness of operations, large-scale production sites, mechanization, standardization of product, specialization, speed of throughput, routinization of the workforce, and a belief that success was based first and foremost upon a notion of 'efficiency.'"³⁴ Risk had been reframed, from something controlled by the individual farm wife (raising backyard chickens to manage the economic risk of farming) to something controlled by corporate risk management departments through structural innovations in poultry farming. Safety, too, had been redefined as the product of scientific rationalization and expert control, with distinctly economic overtones. Cost-benefit ratios ruled. By the 1960s, the poultry industry had adopted the conglomerate model in which one corporation has subsidiary companies that perform the various stages of poultry production in different places: hatchery, growing houses, processing houses, feed suppliers, and distributors. The companies provided the inputs (eggs, chickens, feed, medication), while the contractors supplied the housing, labor, energy, and especially the risk (whether of flock failure or price decline).³⁵

With this new vertical integration, risk and safety were segmented. Risks were borne primarily by the poultry workers, both the contractors who had to provide cash and infrastructure for the poultry raising and the line workers in poultry plants, whose bodies were constantly at risk of injuries

ranging from blindness to amputation. Safety became the achievement of experts in the poultry corporations who developed strategies for preventing flock failure or theft of intellectual property. These included the discovery of vitamin D, the use of electric feeders, and the application of commercial vaccines against poultry illnesses, all of which made it possible for birds to be raised inside on an unprecedented scale, thus (it was thought) keeping them safe from pathogens. As knowledge about chicken breeding was gradually redefined from public to corporate property, a corporation's genetic property could also be made safe from theft, dilution, or imitation of the breed. The poultry industry increased its economic security by hybridizing to increase egg yield or meat production, developing birds with specific qualities for designated markets.³⁶ So, a new three-step breeding practice produced a uniform, standardized chicken that could not be replicated by farmers but had to be purchased yearly from the breeder. As Glenn Bugos notes, "Bred directly into the hybrid chick was the means to keep them from being illegally reproduced."³⁷ If risk had been curtailed, so had profit—it was principally reserved for those who owned the technology rather than those who raised, tended, and slaughtered the poultry.

The risk-management strategy of increasing control over poultry as intellectual property led to innovations in both the hatchery and the scientific laboratory. A premier instance was of the Cobb Corporation, founded in 1916 by a Harvard graduate, a man originally known as New England's major breeder of Barred Plymouth Rocks. Consumers preferred the all-white birds since no dark quills were left in the skin when the poultry was processed, and Cobb responded in 1947 by hybridizing its birds (breeding its all-white hens with the white male birds produced by another corporation, Vantress) to produce a fully white bird. In 1974, just as Cobb was purchased by the Upjohn Company, its partner breeder Vantress was simultaneously purchased by Tyson Foods. Twelve years later, Tyson, the owner of the Vantress pedigree line, and Upjohn, the owner of the Cobb 500 breeding program, the systematic practice of controlled breeding to produce chickens with certain desired characteristics, merged to become the Cobb-Vantress Corporation, with corporate headquarters in Siloam Springs, Arkansas, and subsidiaries in Africa, Southeast Asia, South America, and Latin America. Apt indeed that the corporate logo of Cobb-Vantress should show a rooster whose eye is the globe.³⁸ No chicken, or chicken-related technology, it would seem, was beyond the Benthamite eye of Cobb-Vantress.

Once the price of chickens dropped due to a glut in the chicken market in the mid-1960s, there was little profit in selling whole birds, and chickens were increasingly designed for the competitive global market, in which the most money was to be made by adding value after processing. This technique was inaugurated by Cornell University poultry science professor Robert Baker, who laid the groundwork for chicken nuggets by inventing a deboning machine that took all of the meat off the chicken carcass and developing a variety of ways to reshape the extracted meat: into dinosaur-shaped nuggets, chicken bologna, chicken pastrami, and chicken ham.³⁹ The resulting interest in value adding created incentives for producers. Cobb-Vantress's most recent corporate product, the Cobb 700, was specifically designed for the South American and European markets, where "processors supplying the high meat yield, deboning and added value markets" were soon showing great interest in this new product. It was framed as a major improvement even within the Cobb-Vantress line: "Most important of all, breast meat yield of the Cobb 700 broiler had improved by a full one percent over the Cobb 500 broiler!"⁴⁰ This new bird would keep corporate profits safe, supplying postprocessors with the meat they needed to make the largest profit possible, whether they were producing pre-cut frozen breast portions or deboned, ground, reshaped, and processed chicken products. Such "industrial" birds, designed as sequentially numbered "models," are bred, brooded, and battery-raised (that is, indoor rather than free range) in high density throughout the world.⁴¹ In a global food industry pressured to compete with increasingly higher yields and lower costs, the U.S. (factory) model of poultry farming drives out many of the small local poultry raisers who are less insulated from the risk of price shifts and distribution difficulties.⁴²

Today, the dominance of risk management strategies reaches beyond poultry corporations into the realm of avian science, as corporate laboratories work with the pharmaceutical industry in the production of engineered birds. Even seemingly pure scientific research has corporate ties, though they may be obscured by the discourse of unfettered scientific progress. In 2004, the International Chicken Genome Sequencing Consortium completed sequencing the genome of *Gallus gallus*, the red jungle fowl from which all domestic chickens have descended.⁴³ This accomplishment, two genomics researchers explained in an article in *Nature*, would benefit "agricultural researchers attempting to breed the most productive

strain by recognizing links between DNA sequences and attributes such as egg production.”⁴⁴ What the authors failed to mention is the fact that *all* information obtained through processes developed with monetary support from the poultry industry is unavailable for public analysis or use. Instead, it is considered to be the industry’s property.⁴⁵ Although the Dutch poultry company Hybro calls itself “your partner in breeding,” the information produced by company-funded technical processes is *proprietary*—it’s not available to the general researcher or chicken farmer without permission. Scientific progress is held hostage to corporate profits: no profits without science, no science that is not exclusive corporate property.

Currently, proprietary genetics has converged with big pharma and what my Mennonite butcher calls “big chicken” in the effort to generate a product that will insulate corporations from economic risk while shielding consumers from medical risk. Or so the story goes in one recent articulation of the corporate capacity to guarantee safety. On January 18, 2006, Viragen Corporation, in collaboration with the Roslin Institute, announced that it had succeeded in producing a transgenic chicken. As the company Web site described it, the Ova system turns the chicken into “a pharmaceutical bioreactor” in order to meet the growing market for “protein-based human therapeutics.”⁴⁶ True to the economically productive nature of reflexive risk management, this transgenic chicken is being forecast as the answer to the needs of both the pharmaceutical and poultry industries. Because it is engineered, this new chicken could enable corporations to patent their product, rather than being forced to guard it through elaborate methods of hybridization and industrial secrecy. Moreover, it promises to replace a cheap renewable resource (the hen) for an expensive one (the factory) as the site where new drugs can be produced. Thus, the risk management strategy of poultry corporations converges with pharmaceutical companies’ plans to engineer growth through creating a demand for new drugs. As one commentator observes, corporate poultry science could even use transgenics to make a profit off the avian flu, melding the goals of economic and biomedical safety: “Agribusiness companies stand to reap huge gains in the event that scientists at Cambridge University and elsewhere are able to replace the entire world chicken population with genetically-engineered chicks allegedly resistant to H5N1 virus.”⁴⁷ Once again, in risk lies the opportunity for profit, whether by breeding chickens whose bodies produce valuable treatments for human illnesses or by cashing in on the bioengineering possibilities generated by avian illness.

Defining and Managing Risk

The risk of avian flu, then, is where issues of economic and epidemiological risk converge to produce a new rhetoric of safety. The major players in the global poultry industry have responded to concerns about avian flu by assuring customers that their products are safe *precisely because* they are highly engineered and scientifically surveilled. So Cobb-Vantress explains: “A cornerstone of the company’s success is the adherence to strict internal bio-security and safety standards throughout all operations. Facilities are designed to accommodate the highest bio-security and safety standards to ensure consistent delivery of quality product to customers globally. Bio-security and safety know-how and experience gained internally is [*sic*] often passed onto customers as an added benefit of dealing with Cobb as a supplier of breeding stock.”⁴⁸ Tyson, a major customer of Cobb-Vantress’s chicken lines, takes a very narrow view of the sort of know-how to be passed on to its consumers. This is a far cry from the era when chicken raising depended on folk wisdom shared among farm women. Tyson’s Web site promises “products, recipes, and peace of mind,” thus effectively isolating concerns about safety to the gendered realm of cooking and consuming. In contrast, the nature of the avian flu risk is carefully delineated as foreign: “One kind of avian influenza, High Pathogenic, or Asian, H5N1, has been known to cause problems in humans. At this time, Asian H5N1 has only been found in Asia, the Middle East, and Europe, *never in the United States.*”⁴⁹

The avian flu risk is then defined on the Tyson Web site, with stunning (if seemingly scientific) inaccuracy, to emphasize its racialized and nationalized nature. A list of the “types of avian” flu includes not only the acceptable categories of “low pathogenic” and “high pathogenic” but also a scientifically meaningless third category, “Asian H5N1 High Pathogenic”: “*Currently being found in Asia and Eastern Europe, but not in the U.S. to date.* Some cases in Asia and Eastern Europe of H5N1 spreading to humans through close contact with live birds. Possibility exists of this specific strain of flu being transmitted from humans to humans, which, if it mutates, could lead to the potential ‘pandemic’ for which preparations are being made.”⁵⁰ Defining the measures the company takes to avoid the risk of avian flu and to guarantee the safety of its corporate product, Tyson uses the same formula of Yankee ingenuity, isolation, and indoor confinement that we saw in the 1919 discussion of electrical incubation: “Tyson Foods and other U.S. chicken producers take great care to prevent chickens from being exposed

to diseases. Unlike birds in Asia, which are primarily raised outdoors, commercial chickens in the U.S. are kept indoors, away from wild birds and other means of spreading diseases.”⁵¹

The identification of risk with Southeast Asia, outdoor chicken farming, and wild birds and the identification of safety with U.S. model high-biosecurity intensive chicken farming are as misdirected as Fox-lox’s “guidance” is to Chicken-licken. A low pathogen strain of avian influenza evolves into a high pathogen strain precisely because it has passed repeatedly through the great numbers of chickens held in high-density poultry houses. The sheer number of potential mutations available to a virus in such circumstances elevates the likelihood that a new strain will appear, one no longer limited to the bird-to-human infection process. This is the fear, then: that such a high pathogen strain of avian influenza *with the new capacity of direct human-to-human transmission* will emerge from the crowded, filthy conditions of the factory farm. The culprit in that case will clearly be the poultry industry, whose practices will have accelerated the movement of the virus through the avian population. Veterinarians and conservationists identify two practices common to industrial poultry production that have contributed to the seeming speed with which H5N1 has traveled from its emergence in Southeast Asia to its current outbreaks in Europe and Africa: the global shipping of day-old chicks and the practice of intensive battery-raising of young adult birds.

“The chick trade ‘has made the chicken the most migratory bird in the world,’” according to Adrian Long of BirdLife International.⁵² Mike Davis has laid the blame for the intensive battery-raising of young adult birds on the international poultry industry, which he argues has deliberately framed biosecurity by distinguishing between the so-called high-security, high-volume growers and the purportedly unsafe and unsanitary methods of backyard poultry growers.⁵³ Indeed, rather than adopting the misnomer “Asian bird flu,” it might be more accurate to call this the “free trade flu,” since we can attribute the increasing risk of an explosive outbreak of H5N1 to the global movement of day-old baby chicks from U.S. corporate hatcheries to contract growers overseas coupled with the exportation of U.S. methods of high-volume poultry raising. The rapid mobility of poultry has introduced a potentially new element into the international transportation of chickens: patho-politics: “When a new virus gets into a barn packed with thousands of young chickens that have been genetically selected for their plump breasts rather than their ability to survive in the wild, it leaps from

bird to bird, mutating slightly each time, and sometimes morphs into a lethal strain—just as the 1918 Spanish flu was believed to become more deadly as it passed through crowded American military camps during the cold winter of 1917.”⁵⁴ However, patho-politics aside, the industrial poultry industry raises issues of risk and safety even before we consider the threat of avian flu. As it is currently structured, conventional large-scale poultry production poses a risk to the physical and emotional health of human beings as well as the chickens it produces. A January 2005 report by the U.S. Government Accountability Office (GAO) documented that the young, male, and/or predominantly Hispanic workers had rates of injury “among the highest of any industry.” These injuries included not only “cuts, strains, cumulative trauma caused by repetitive cutting motions,” but also “injuries sustained by falls, more serious injuries, such as fractures and amputation,” and illnesses caused by “exposure to chemicals, blood and fecal matter.”⁵⁵ It’s worth noting that even the GAO got precious little cooperation from the poultry industry in carrying out the investigation leading to this report.⁵⁶ The very characteristics of contemporary poultry farming—in which the chickens are subject to overcrowding, stress, filth, lack of sunlight, and induced immunosuppression from selective breeding and monoculture—pose a health risk for chickens and human beings. As Greger points out, “Stressful, overcrowded confinement in industrial poultry facilities facilitates immune suppression in birds already bred with weakened immunity, offering viruses like bird flu ample opportunities for spread, amplification, and mutation” (*Bird Flu*, 214).

Despite the stress on the Western industrialized model of poultry farming for its promised “biosecurity,” the global dominance of that model of poultry farming is far from complete. While poultry growers in Thailand have exhibited stunning success in the transformation of that industry under the guidance of Dhanin Chearavanont, whose giant factory farms and contract growers have effectively marginalized the traditional method of backyard chicken farming, other Southeast Asian nations have taken a different route (*Bird Flu*, 214–15). In Laos and Cambodia, an alternative model dominates, in which many small farmers grow small numbers of unconfined chickens; the same model is followed in Africa and South America. “Despite efforts to develop intensive poultry production, family poultry (FP) are still very important in developing countries,” explains E. F. Guèye. “In most developing countries, the keeping of poultry by local communities has been practiced for many generations. FP keeping is a widely practiced activity.

More than 90% of rural families in most developing countries keep one or more poultry species (i.e. chickens, ducks, guinea fowls, geese, pigeons, etc.) and all ethnic groups tend to be involved in FP production.⁵⁷ These “family poultry management systems” have become increasingly significant models for so-called developing countries both because they adapt a system of chicken raising that has been working successfully for many generations and because the distinctly gendered aspects of family poultry markets (in the third world, poultry keepers still tend to be mostly women) provide valuable economic autonomy and agency to rural women.⁵⁸

The truth, if you will, about risk, safety, and the avian flu is closer to Chicken-licken’s story or the *Onion*’s satire than it is to the pronouncements of the CDC. The health risks posed by H5N1 are intersectional: interwoven with existing economic and social inequities. The major risk with avian flu is not the potential for the virus to jump from birds to humans, nor is it the risk of a pandemic, but rather it is the effects of an outbreak on those who farm, and eat, chickens. According to avian diagnostic pathologist Dr. Patricia Dunn, the greatest risk is to the *emotional* health of farmers and their families who may lose their flocks to an outbreak, thus losing their livelihood, and the potentially devastating risk to *nutritional* health if people lose their access to chicken meat and eggs, one of the few easily accessible sources of protein for people living on a subsistence level throughout the world.⁵⁹

The bioterrorism metaphor invoked by Taubenberger to describe the avian flu is, like all metaphors, enabling as well as merely descriptive. In 2003, the Pentagon proposed a program called the Futures Markets Applied to Prediction (FutureMAP). This initiative “would have involved investors betting small amounts of money that a particular event—a terrorist attack or assassination—would happen.”⁶⁰ Bad press on Capitol Hill killed this initiative, according to a CNN report: Senator Tom Daschle (D-SD) noted, “I can’t believe that anybody would seriously propose that we trade in death,” while Senator Barbara Boxer (D-CA) observed, “There’s something very sick about it.”⁶¹ Yet no such objections seem to shadow the Iowa Health Prediction Market. Framing itself as “a step beyond disease surveillance,” this initiative of the University of Iowa invites health care workers to wager donated money on the risk of an avian influenza outbreak, essentially offering them a *risk-free* investment in risk. Its Influenza Prediction Market uses the profit motive to encourage “physicians, nurses, pharmacists, clinical microbiologists and epidemiologists” to share the infor-

mation that may enable the forecast of influenza activity before an outbreak actually occurs. Giving each health care worker/trader an “education grant of \$100 with which to trade,” the market gauges the “consensus belief” about the likelihood of an influenza outbreak. The Influenza Prediction Market Web site explains that it views the Influenza Prediction Market as a “supplement that can quickly aggregate expert opinions based on existing surveillance information. . . . The probabilities generated by this market could help policymakers and public health officials coordinate resources, facilitate vaccine production, increase stockpiles of antiviral medications, and plan for allocation of personnel and resources.”⁶²

Antiterrorist initiatives have also shaped another initiative aimed at increasing food safety, the National Animal Identification System (NAIS) of the USDA. This plan, a USDA pamphlet explains, was created in response to the “increasing number of animal disease outbreaks . . . reported around the globe,” as well as the “*single cow* that tested positive for bovine spongiform encephalopathy (BSE) in the United States in December 2003.”⁶³ The dizzying arrangements proposed include seven-character IDs for individual livestock producers, fifteen-character IDs for individual animals, and thirteen-character IDs for groups of animals. The NAIS received some well-deserved ridicule on the Pastured Poultry listserv, as small chicken farmers weighed the absurdity of labeling individual chickens. Yet here, too, the notion of risk and the promised goal of safety are inflected by the xenophobic and racist discourses already circulating in the “war on terror” discourse. The program proposes to “enhance foreign animal disease surveillance, control, and eradication” and thus “improve biosecurity protection of the national livestock population,” by issuing “official identification for animals in interstate or international commerce.”⁶⁴

Despite the constructions of risk and safety implied by such cloak-and-dagger strategies, the real risk of the avian flu lies in its potential to compound already existing global economic and health disparities. Any real conception of safety must lie not in surveillance but in openness to modes of awareness beyond the dictates of expert science. As a Maryland poultry farmer observed, “Modern day poultry production is so highly concentrated that this disease can spread so rapidly. . . . We can’t ignore this any longer” (*Bird Flu*, 356). We should take our guidance neither from Fox(-lox) nor from the (virtual) king, even though they pose as experts, and even though it may seem that the sky is falling. Instead, we should trust our own common sense, be aware of our surroundings, and look for the acorn.

Notes

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- 2 I am referring here to a way in which a kind of "folk wisdom" girds Hoggart's and Williams's work in, respectively, *The Uses of Literacy* and the famous essay "Culture Is Ordinary." Richard Hoggart, *The Uses of Literacy* (1957; Edison, NJ: Transaction Publishers, 1998); and Raymond Williams, "Culture Is Ordinary," in *The Raymond Williams Reader*, ed. John Higgins (1958; Oxford: Blackwell, 2001), 10–24.
- 3 Centers for Disease Control, "Key Facts about Avian Influenza (Bird Flu) and Avian Influenza A (H5N1) Virus," May 7, 2007, www.cdc.gov/flu/avian/gen-info/facts.htm.
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- 5 "Nation's Leading Alarmists Excited about Bird Flu," *Onion*, February 2, 2005.
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- 7 Ulrich Beck, *The Brave New World of Work*, trans. Patrick Camiller (London: Polity Press, 2000).
- 8 *Ibid.*, 131; emphasis mine.
- 9 See Michael Greger, MD, *Bird Flu: A Virus of Our Own Hatching* (New York: Lantern Books, 2006), 34; hereafter cited parenthetically by page number as *Bird Flu*. See also Mike Davis, *The Monster at Our Door: The Global Threat of Avian Flu* (New York: New Press, 2005).
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- 14 Terrence M. Tumpey et al., "Characterization of the Reconstructed 1918 Spanish Influenza Pandemic Virus," *Science* 310 (October 7, 2005): 77–80.
- 15 Andreas von Bubnoff, "The 1918 Flu Virus Is Resurrected," *Nature* 437 (October 6, 2005): 794–95, 795.
- 16 United States National Science Advisory Board for Biosecurity, meeting minutes, November 21, 2005, www.biosecurityboard.gov/meetings/NSABB%20November%202005%20meeting%20minutes%20-%20Final.pdf.
- 17 von Bubnoff, "The 1918 Flu Virus," 795.
- 18 *Fatal Contact: Bird Flu in America*, written by Ron McGee, directed by Richard Pearce, ABC, May 9, 2006.
- 19 U.S. Department of Health and Human Services, "Bird Flu in America," www.pandemicflu.gov/news/birdfluinamerica.html (accessed July 30, 2007).

- 20 Fifth International Bird Flu Summit, brochure, New Fields Exhibitions, www.new-fields.com/birdflu5/pdf/5bf_low.pdf (accessed July 17, 2007).
- 21 Fifth International Bird Flu Summit, New Fields Exhibitions, www.new-fields.com/birdflu5/index.php (accessed July 24, 2007).
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- 23 Carolyn Sachs, *Gendered Fields: Rural Women, Agriculture, and Environment* (Boulder, CO: Westview Press, 1996).
- 24 Dictionary.com, "Animal Husbandry," <http://dictionary.reference.com/browse/animal%20husbandry> (accessed July 24, 2007). See also Gordon Sawyer, *The Agribusiness Poultry Industry: A History of Its Development* (New York: Exposition Press, 1971); hereafter cited parenthetically by page number as *API*.
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- 26 John L. Skinner, *American Poultry History 1823–1973* (Madison, WI: American Printing and Publishing, 1974), 38.
- 27 Deborah Fink, *Open Country, Iowa: Rural Women, Tradition, and Change* (Albany: State University of New York Press, 1987), 49. See also Sachs, *Gendered Fields*.
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- 29 *Ibid.*, 135.
- 30 The poultry industry workforce shifted from its predominantly African American composition in the 1970s to Mexican and Central American immigrants during the 1980s and by the turn of the next century relied so heavily on an immigrant workforce that the U.S. Justice Department filed a series of suits against Tyson Foods for smuggling illegal immigrants from Mexico to supply fifteen poultry-processing plants in the southern United States. Steve Striffler, *Chicken: The Dangerous Transformation of America's Favorite Food* (New Haven, CT: Yale University Press, 2005), 98.
- 31 C. Nisson, "Development of the Hatching Industry of the United States," press release, n.d., American Poultry Historical Society Personal Collection of O. August Hanke, box 1 of 2, National Agricultural Library, Beltsville, MD.
- 32 Harry R. Lewis, *Making Money from Hens* (Philadelphia: J. B. Lippincott, 1919), 59–60.
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- 35 Glenn Bugos, "Intellectual Property Protection in the American Chicken-Breeding Industry," *Business History Review* 66.1 (Spring 1992): 127–268, 146.
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- 38 Less fitting perhaps, given the arduous physical work that such industrial poultry practices require, is the fact that Siloam is a Biblical term meaning a place where healers minister unto the afflicted.
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- 40 "Cobb 700 on Target for Low-Cost, High Meat Yield," *Cobb Focus* 2 (2002): 1.

- 41 Of course, the industrial model still remains one among several, alongside the family farm and the small farm. Yet, industry, government agencies such as the Peace Corps, and even NGOs such as the Heifer Project are exporting the U.S. industrial model to other parts of the world. See Sachs, *Gendered Fields*. To recap, in addition to concentration on market breeds like the Cobb 700, this model relies on contract growers, who provide the property, buildings, and risk and who are provided by the industry with the chicks, feed, and management protocols to raise them until they are sold back to the industry at a price that fluctuates with the international market.
- 42 Sachs, *Gendered Fields*.
- 43 International Chicken Genome Sequencing Consortium, "Sequence and Comparative Analysis of the Chicken Genome Provide Unique Perspectives on Vertebrate Evolution," *Nature* 432 (December 9, 2004): 695-777.
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- 45 However, the story does include among the beneficiaries of the accomplishment "comparative genomicists desiring to accurately identify the functional elements of the human genome; and genome-sequence producers." *Ibid.*, 679.
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- 56 The GAO report suggests that the authors found industry cooperation lacking when they were compiling their report. For example, the report cites the problem of inadequate

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- 64 *Ibid.*

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