

Joel Novek¹

Pigs and People: Sociological Perspectives on the Discipline of Nonhuman Animals in Intensive Confinement

ABSTRACT

Highly concentrated intensive confinement systems have become the norm in agriculture concerning nonhuman animals. These systems have provoked a lively debate from an animal welfare perspective. Sociologists can contribute to this debate by drawing parallels between the institutional regulation of human beings and of animals under confinement. Results of research on the transformation of Canadian hog production from the 1950s to the present—based on the evolution of plans for sow housing produced by the Canada Plan Service—showed a much tighter compression of hog bodies and reproduction in space and time. The prevalence of behavioral stereotypes, however, indicates imperfect animal socialization and reconfiguration. The concept of discipline is a useful perspective that could bridge the gap between the regulations of humans in industrial societies and of pigs in intensive confinement. This concept derived from elements of labor process and Foucauldian and post-humanist theories.

In the past half-century, the system of agriculture concerning nonhuman animals has undergone a profound transformation. Mixed arable livestock systems that combine grain and meat production largely have given way to industrialized, intensive confinement

operations for poultry, dairy, and swine (Kunkel, 2000). Animal production has moved out of pastures and barnyards and indoors into climate-controlled structures (Fraser, Mench, & Millman, 2001; Thu, 2003). Mechanization of animal handling, feeding, and waste disposal has substantially reduced the need for human labor input (Fraser et al.). Animals, kept indoors and confined in cages or pens through the various stages of their lives, have little opportunity to move around (Mason & Singer, 1980). Intensive confinement operations have become year-round, continuous production systems, replacing the seasonal or batch production characteristic of mixed agriculture.

The new production technologies were not scale neutral with respect to farm size (Halverson, 2000). Mechanized animal agriculture is capital intensive and provides cost advantages to larger operations better able to recoup their investment through high volume output (Van Arsdell & Nelson, 1984). In Canadian swine production, a relatively small number of big factory farms have replaced the large number of mixed grain and hog farms that once dominated the landscape. As late as the early 1950s, hogs were the most widely produced form of livestock in Canada and were reported on 500,000 Canadian farms (Wilson, Stothart, & DeLong, 1951). By the new millennium, Canada's pig population had more than doubled to more than 14 million, but the number of hog farms dropped below 13,000, representing just 6% of all farms (Statistics Canada, 2001a). The average number of pigs per farm is now over 900 head (Statistics Canada), and the largest 7% of hog farms account for one-half of Canada's swine herd (Statistics Canada, 2001b).

Social scientists have devoted growing attention to animal production systems. Theoretically, the transition from mixed grain and livestock to specialized monocultural production has been analyzed as the ascendancy of a liberal productivist agrifood complex (Friedman, 1998). Mechanization, the growing role of corporate producers and suppliers, the declining role of farmers, and international restructuring of markets, are all hallmarks of this trend (Hamilton, 1994). The new animal agrifood complex is characterized by concentration, corporate domination, and global marketing of a monocultural product (Thu & Durrenberger, 1998). Significant attention has been devoted to the environmental impact of factory farms with their accumulation of livestock manure and its potential threat to air, water, and soil quality (Bell, 1998; Novek, 2003). Other researchers have stressed social inequality resulting from

economic concentration in the livestock sector and a steep decline in the number of small family farms (Thu, 1996; Thu & Durrenberger). They view the loss of family farms to competition from larger producers as weakening the social viability of rural communities.

Social scientists also need to address the structure of animal regulation under intensive confinement. What strategies, techniques, and technologies have humans employed to manage the livestock under their charge? This question has been addressed thoroughly and documented from an animal welfare perspective (Harrison, 1964; Mason & Singer, 1980; Singer, 1991; Fraser et al., 2001; Ekesbo, 1988; Halverson, 2000; 2001). The discussion has centered largely on the treatment of animals under intensive confinement—whether it is reasonable, or oppressive or inhumane, and whether it can be improved. Social scientists have no special expertise in this area. They can, however, draw parallels between the institutional regulation of humans and of animals. Livestock, like humans, are sentient beings who have been subject to various techniques of manipulation and control. Techniques for the management of humans long have been the object of sociological analysis, and some of these insights can be applied to understanding the management of livestock. As Latour (1999) states, “Whenever we learn something about the management of humans we shift that knowledge to nonhumans and endow them with more and more organizational properties” (p. 207).

Discipline

Discipline—especially the disciplinary techniques of factories, prisons, and hospitals—can bridge the gap between the control of humans in industrial society and the control of livestock in confinement systems. The ensemble of these techniques and their application make up what O’Neil (1992) has termed “the disciplinary society” (p. 162). The goal of social organization in this society is the efficient regimentation of docile bodies that—in the industrial sector—allows for continuous production under management control. The subjects of discipline lose control over their output and pace of production. In industrial societies, discipline tends to be increasingly technical in nature. This means that discipline is imposed on subjects through technical controls embedded in machinery, structures, and technological processes (Edwards, 1979). If we apply this concept to livestock agriculture, the argument can be advanced

that intensive confinement operations represent a transition from mere domestication of animals to the imposition of industrial discipline.

The concept of discipline applied in this analysis has been drawn from three sources: (a) labor process theory, (b) Foucauldian notions of bio-power, and (c) post-humanist perspectives on the integration of humans and nonhumans. Labor process theory looks at the two-way interaction between the creative, working human being and the natural world (Dickens, 2002). It examines the process by which work, a purposive activity, is transformed by organization and technology and how the powers of nature are deployed to produce the goods that humans want. Bio-power, according to Foucault, represents the reproductive and developmental potential of living bodies harnessed to the service of power (Dreyfus & Rabinow, 1983; Rabinow, 1984). Bodies are transformed into docile and productive subjects through the agency of power. The post-humanist perspective (Haraway, 1991; Latour, 1999) sees modern social organizations as hybrids, composed of networks of humans, technical artifacts, and nature. Livestock agriculture is a social construction designed to exploit the reproductive power of animals (Latour) who possess the status of actants within the networks. A discussion of sociological perspectives will develop these ideas further.

This paper focuses on the strategies and technologies used by humans to regulate the commercial swine herd. A critical analysis of these animal control systems from the viewpoint of the three sociological perspectives should shed some light on the usefulness of social science concepts as lenses for viewing the treatment of animals under conditions of industrial agriculture. The Canadian swine industry serves as an excellent case study of the transition to intensive production. For the past thirty years, hog production has grown more rapidly than any other form of livestock production. Those years have brought a massive shift from pasture and barnyard to intensive confinement systems and a concomitant increase in economic concentration. Given Canada's northern and often inclement climate, indoor confinement systems have proved especially popular for raising hogs.

Over the past half century, The Canada Plan Service (CPS) has documented the changes in the Canadian swine industry through the evolution of the various plans and blueprints for hog operations that it produced. From 1953 to 1996, CPS was an agricultural engineering service, carried out by the Canada

Department of Agriculture in collaboration with the provincial departments of agriculture. In 1996, CPS was disbanded. Its mandate was to provide Canadian farmers with a range of plans on a wide variety of agricultural techniques that incorporated the latest technologies. The Canadian Agricultural Library in Ottawa lists 70 CPS plans in its holdings devoted to hog farming. This paper examines 22 CPS plans—ranging from the 1950s to the 1980s—for swine structures and hog barns as components of a “technical code” (Feenberg, 2002) shaping farmers’ perceptions of the most recommended means to regulate their swine herds (Appendix).

The Industrialization of Canadian Hog Production

At mid-twentieth century, Canadian hog farming generally was batch production on a small scale as an adjunct to grain production (Wilson et al., 1951). Pigs were raised in pastures and open feedlots with access to bedded shelters. By today’s standards, structures for housing pigs were small and primitive—often open-ended shelters or portable huts. Sows were confined to pens during the farrowing (birthing) process. Otherwise, they had—compared to today—considerable freedom to move about (Wilson et al.). The weaning period for young pigs lasted 8-10 weeks. Sows would be re-bred when weather conditions and farm labor availability permitted (National Research Council, 1980). The biggest problem facing this outdoor extensive system—and the reason it could not grow beyond a form of batch production—was the inability to farrow or give birth to new piglets during the long, cold, winter months. Young pigs, kept outdoors or in primitive shelters, simply could not survive Canadian winters. (Turnbull & Bird, 1981). Producers only could farrow their sows at certain times during the year—most commonly in spring.

As a solution, indoor pig production had been advocated for some time but had faced powerful obstacles. Chief among them was the difficulty of providing adequate nutrition for pigs without access to pasture and the threat of diseases spreading in comparatively cramped indoor conditions. Research conducted in the 1940s and early 1950s at the Canadian federal experimental farm at Lacombe, Alberta, demonstrated that pigs confined indoors in sanitary feeding pens and fed a mixture of grain and protein supplements made faster and more economical gains than those raised on pasture (Wilson et al.

1951). Vitamin B12 had been isolated as an active ingredient in animal protein supplements. It was most effective when combined with antibiotics such as penicillin as a feed supplement to assure a rapid rate of gain. Antibiotics held another big advantage for indoor pig production. They were essential for keeping young pigs healthy and preventing the spread of communicable diseases in indoor conditions (National Research Council, 1980).

The development of commercially available feeds and feed supplements meant that hogs could be raised successfully all year round. No longer were farmers restricted to their own grain and pasture in raising their herds (Van Arsdell & Nelson, 1980). Pig farms could become larger and more specialized by raising hogs indoors and purchasing grain and feed supplements to give them greater production capacity. Other obstacles to larger scale pig production remained to be overcome. One was the loss of many young pigs to “overlaying” or crushing by the sow during nursing (Deyoe & Krider, 1952). A second problem was the labor-intensive nature of raising swine. Efforts to find a technical solution to both these problems contributed to the industrialization of hog farming and the subjection of the pigs, especially the breeding herd, to much tighter industrial discipline.

One area increasingly subject to discipline was the birthing process known as farrowing. Sows began to be bred year round to assure a continuous supply of piglets. To speed up the process, the weaning period was reduced to four weeks, so that the sow could be re-bred more quickly (Halverson, 2001). Because the gestation period is about four months, sows now can average more than two litters a year (Singer, 1991). To solve the problem of crushing during nursing, producers began to confine sows in farrowing stalls (Halverson). These stalls provide minimal space for sows, usually less than 20 square feet (Phillips & Fraser, 1993). The sows cannot walk or turn around. Bars or rails line the sides of the stall. They provide a “creep”—a zone supposedly protecting the piglet from being crushed by the sow. When farrowing stalls first were introduced, they were used only for a few days; then the sow was transferred to a larger pen (Phillips & Fraser, 1993). However, producers began to leave sows in the stalls for longer and longer periods that finally encompassed the entire lactation cycle. These stalls represented a form of technical control designed to improve the piglet survival rate and reduce the need for human labor in animal handling. They also saved space and allowed more pigs to be crammed into the barns.

The same dynamic of intensified discipline through the widespread dissemination of a technical solution can be seen with the common use of gestation stalls. “Function creep” (Winner, 1977) is a term used to describe the tendency of a technological innovation to find new applications. This applies to gestation stalls first introduced to control sows’ feeding during the critical breeding and gestation period (Halverson, 2001). Under confined conditions, there is competition among sows for feed. This would be less of a problem in more spacious conditions where the sows would be able to establish natural hierarchies of dominance and submission. In confinement, however, competition and aggression are intensified; the dominant or “boss” sows may get more than their share of feed; the subordinate ones, not enough (Halverson).

The technical solution to this problem was individual feeding stalls about two feet wide and six feet long (Singer, 1991). This restricted fighting and guaranteed more accurate feeding. What first was introduced mainly for feeding soon became the normal mode of sow confinement during the entire four-month gestation period.

Breeding sows are subject to rigid confinement through virtually all stages of their lives. The nursing period was reduced, and sows are quickly re-bred so there is no slack time when they are not in production. Producers have achieved a remarkable time-space compression of the hog breeding process. More pigs are crammed into confined spaces, and the breeding cycle has been speeded up so that the average sow produces 2.3 or even 2.6 litters per year (Turnbull & Bird, 1981). Young pigs move from nursing to weaning to finishing and are prepared for market in about 190 days. Production is conceptualized as a series of cycles, or “pig flows”: one for the breeding sows to be continuously bred, farrowed, and re-bred and another for the market hogs to move through the progression from nursing to weaning to finishing and market.

Industrial Paradigm: Claims and Counterclaims

Disciplinary regimes require a legitimating ideology so that people may be convinced that the structure of power is in everyone’s best interest (Beetham, 1991). The industrial paradigm has been the dominant perspective used to explain and justify the development of the factory system of animal production. The industrial paradigm assumes that the industrialization of agriculture parallels and follows the reorganization of capital, labor, and technology

that has occurred in other sectors of advanced economies: "Animal agriculture is undergoing a process of reorganization and technological transformation parallel to processes that occurred much earlier for other sectors of the economy" (Thompson, 2001, p. 199). Proponents argue that current structural changes in agriculture are progressive because they increase human capacity to provide food more abundantly and a quality of life that is higher for a greater number of people (Rhodes, 1995; Stricklin & Swanson, 1993). According to economic theory, industrialization is based on a continuous reorganization of production in terms of increasing specialization, a more acute division of labor, and the substitution of machines for human labor to increase efficiency (Piore & Sable, 1984). When this paradigm is applied to animal agriculture, the animals must be constructed socially as resources and subjected to an intensely mechanistic, reductionist, and manipulative regime.

The reductionist approach to animals, especially animals on the farm, has ideological and ethical considerations. Shiva (1997) states:

When organisms are treated as if they are machines, an ethical shift takes place, life is seen as having instrumental rather than intrinsic value. . . . The reductionist machine view of animals removes all barriers of ethical concern for how animals are treated to maximize production (p. 32).

Merchant (1980) makes a similar, if broader, point in relation to the colonization of nature by industry: "Because nature was now viewed as a system of dead, inert particles moved by external, rather than inherent forces, the mechanical framework itself could legitimate the manipulation of nature" (p. 193). If we believe that nature, including animal nature, is composed of material objects, devoid of sentience and open to human manipulation, then any objections we might raise against such manipulation for human benefit more easily are overruled.

Although the industrial paradigm remains the dominant perspective through which our society views animal agriculture, opposition to it is growing. The animal welfare movement has mounted one of the most significant challenges to the industrial paradigm of animal production and the instrumentalist view of animals. Animal welfare proponents have argued that livestock are not mechanical objects but living creatures who suffer profoundly from abuse and cruelty in factory farms (Rollin, 2001). As early as 1965, the Brambell

Commission in Great Britain, acting in response to Harrison's (1964) expose of animal abuse, recommended a bill of rights for farm animals (Halverson, 2000). This included basic rights such as the right to stand up and turn around, rights still routinely denied to millions of pregnant sows in North America confined to gestation crates. Perhaps the strongest case for animal suffering under intensive confinement has been the prevalence of the physiological and behavioral disorders called stereotypies (Singer, 1991; Baxter, 1989), which are common in the confined hog industry. These abnormal, repetitious, and, apparently meaningless behaviors—gnawing, bar biting, and tail biting—may go on for several hours each day (Halverson, 2001). This evidence of animal distress has reinforced public perceptions that confined pigs are sentient creatures whose suffering would be mitigated under conditions that are more humane.

Support for the view that pigs are highly intelligent and sociable has come from European research on the behavior of domesticated pigs released into semi-natural environments called "pig parks" (Halverson, 2000, pp. 97, 98). Scientists observed that pigs communicated with each other in a variety of vocalizations. They also are clean animals, dunging far away from feeding and nesting areas. Halverson (2000) states,

In the pig parks, scientists observed that pigs were very active in the day, foraging, socializing, and exploring their environment. They maintained social organization and built nests for night rest. Sows isolated themselves, gathered material, and built nests before giving birth (p. 98).

This research established a much clearer understanding of the suffering of pigs in confined environments where so many of their most powerful behavioral inclinations such as rooting, nest building, and socializing, cannot be carried out.

As Fraser (2001) points out, these observations are part of a general cultural trend in which the older notion of human uniqueness is coming under attack. There is a growing focus on the physiological and behavioral connections between humans and other animals (Coppinger & Smith, 1983). A more sentimental view of animals (Jasper & Nelkin, 1992), with its roots in critical scholarship, popular literature, and scientific research, has challenged the commercial agricultural view of animals as commodities to be produced,

processed, and traded. In terms of critical scholarship, the work of Singer (1991) and Regan (1985) has been influential in the area of animal rights and in opposing the assumption that animals are available for human exploitation. Popular writers who have drawn public attention to systemic animal abuse in factory farming also have made these points (Masson, 2003). Fraser (2001) believes that the most significant contribution has come from science that, ironically, also has been held responsible for the reductionist view of animals now under attack. He argues that modern science has established the fundamental similarities between humans and other animal species in terms of anatomy and evolutionary theory (Rachels, 1990). Led by the primatologists (Goodall, 1971; Fossey, 1983), scientists have begun to study animal behavior in ways that reveal the intelligence, resourcefulness, and complex socio-emotional lives of specific animal subjects. The European research carried out in pig parks—discussed above—follows this thread. All these points, according to Fraser (2001), clearly are,

symptomatic of a much broader revision of human thinking about the nature of animals, a reevaluation of their worth, and a serious questioning of ways of treating animals that seemed uncontroversial in earlier decades. The implications for animal agriculture are profound (p. 179).

Academic and scientific opinion, as well as popular culture, have contested the instrumentalist and reductionist view of animals and are leading to a contrary social construction of animals as much closer to humans in terms of biology and behavior. Murphy (2004) has provided a framework in which the actions of nature feed back on and influence the perceptions of nature held by humans. In his framework, human conceptions are influenced by “prompts” from “nature’s actants” (p. 254). In this paper, nature’s actants are animal actants—confined pigs on factory farms who are sentient creatures and capable of at least a limited amount of agency. Two kinds of prompts are relevant here. There are “everyday prompts” from common processes of nature. This could refer to the prevalence of animal stereotypes that—mediated through accounts in popular literature and the press (Adcock & Finelli, 1996)—have provided the public with representations of the physical and behavioral abnormalities of confined pigs and have reinforced opposition to factory farming. There also are “scientific prompts” that flow from scientific research. In this case, it is the work of animal welfare scientists (Halverson, 2001; Fraser

et al., 2001) who have documented the pain and misery of pigs in confinement and contrasted them with the resourcefulness of pigs in comparative freedom, as in the pig parks. The industrial paradigm, with its mechanistic view of animals as simple machines or cogs in the wheel of industrialized agriculture, is losing force as an effective legitimating device for factory farming.

Sociological Perspectives

The declining legitimacy of the mechanistic and instrumental view of farm animals has opened up space for sociological theory to provide some suggestions as to the kinds of social relationships that prevail between humans and domesticated livestock. Our interest as sociologists is to examine how techniques of discipline extend from human institutions and apply to animals. Because there is a well-established sociological literature of the labor process—which analyzes the deployment and subordination of human workers under capitalism—and because our understanding of the connectedness of human and animal behavior is deepening, it makes sense to start there, taking the connection one step farther.

Labor Process: Animals as Subordinate Workers

A number of writers make the analogy between domesticated farm animals and human slaves or subordinate workers (Clatton-Brock, 1994; Halverson, 2000; Noske, 1997). The functionalist view of symbiosis between agricultural producers and farm animals (Coppinger & Smith, 1983) is rejected. Domesticated livestock are seen as exploited for human consumption in a system for which they receive no benefits beyond survival of the breed. Noske (1997) views farm animal exploitation from a Marxist perspective and provides the most sociologically sophisticated account. She argues that capitalism has incorporated animals fully into its production technology. Drawing on labor process theory, she states that mechanization and rationalization of production characterize modern animal agriculture, a detailed division of labor, and a de-skilling of animal capacities (Noske). Confinement systems are designed not only to crowd many animals into a limited space and manipulate them to greater productivity but also to subdivide animal skills and bodies to control them better according to principles of industrial engineering. Noske writes,

The animals' natural capacity for movement, play, preening, social interaction, and contact with the natural environment is almost felt to be subversive: much animal behavior is referred to as "unbusinesslike". Like the human worker's creativity it has to be kept under control or better still done away with. All animal activity must be directed towards cheap and rapid production of human wanted things (p. 15).

Animal agriculture engages in the colonization of animal reproductive cycles where control has passed from animals to machines and managers. The sphere of reproduction—mating, breeding, gestation, and birth—is converted into "working time" (Noske, 1997, p. 17). She argues that this process parallels the alienation and loss of control experienced by human workers under capitalism. This is an important insight. Livestock are neither inert objects nor machines: Rather, they are living beings with productive and reproductive capacities that have been repressed, controlled, and narrowly channeled in the interest of productivity and profit. Innovations in technology and work organization, which have reduced the need for human skills in animal husbandry, also have been imposed at the expense of animal skills and capacity.

An example of this is how modern factory farming virtually has dispensed with the sow's role in suckling, nurturing, and raising her piglets. To speed up the rate at which sows could be rebred to produce new litters, the weaning period was reduced first from 8 to 10 weeks to 4. Now, segregated early weaning (SEW)—in which pigs are weaned at between 5 to 15 days before their immune systems are fully developed and transported to special sterilized nurseries—has become increasingly common. Sows can be rebred even sooner, but their maternal role, after farrowing, is no longer needed. Even though factory discipline dispenses with animal skills, Noske (1997) raises the possibility of social change by imparting agency to animals. Just as human workers can benefit from improvements in quality of work life, farm animals also could benefit—through reduced stress and stereotypic disorders—from significant reforms in how animal production units are organized.

The analogy between farm animals and human workers is far from a perfect fit. The labor process model that Noske (1997) employs is based not on slaves or workers in captivity but, rather, on workers in an economically dependent relationship to their employer (Braverman, 1974). Critical aspects of this theory deal with the relative bargaining power of labor and capital and thus

have only limited application to animals in confined production. Perhaps most significantly, modern intensive animal agriculture is concerned much more with the reproductive than with the productive activities of livestock. Rather than their labor power, the reproductive power of animals—to reproduce and grow—is colonized. This suggests that other perspectives that deal more specifically with bodies, sexuality, health, and reproduction, might be brought to bear on the discipline of farm animals. The notion of “bio-power,” developed by Foucault to describe the harnessing of human bodies to the interests of social power, comes to mind.

Bio-Power: Animals as Productive Bodies

Labor process theory views power as concentrated in the capitalist mode of production. Foucault (1978) sees it as omnipresent, coursing through the myriad nodal points and capillaries of society. Foucault describes bio-power as a series of techniques or “disciplines” designed to manipulate human bodies and transform them into docile and productive subjects (p. 139). These disciplinary techniques were perfected in the major institutions of emerging industrial societies such as factories, prisons, hospitals, and barracks (Dreyfuss & Rabinow, 1983). The consequence was the insertion of disciplined and orderly bodies into the machinery of production. The emphasis on disciplining human bodies and sexuality in the interests of power makes the Foucauldian notion of bio-power a useful perspective to be applied to animal agriculture. If human bodies can be colonized for their vitality and reproductive power, then similar techniques can be applied to the discipline of animal bodies. The goal is to forge “a docile body that may be subjected, used, transformed, and improved” (Foucault, 1979, p. 136).

In the Foucauldian perspective, bodies are subdivided into their constituent parts for purposes of discipline, control, and retraining (Dreyfuss & Rabinow, 1983, pp. 153, 154). To achieve the goal of total docility, control must be exercised carefully over space, time, and motion. This means that bodies must be organized into specific enclosures of space, which are partitioned into regular units like slots on a grid: “Each individual has a place and each place has an individual” (Foucault, 1979, p. 143). The slots are designed to facilitate bodily discipline. Other Foucauldian principles include surveillance, hierarchical observation, individualization, and normalization (Rabinow, 1984).

Power is exercised in descending order; control brought about by separating individual bodies and subjecting them to surveillance. Careful accounting and the compilation of dossiers on the progress and performance of each body facilitate normalizing judgment (Rabinow, 1984). These observations provide a constructive perspective on the Canadian intensive hog industry. To ensure maximum surveillance and control of hog bodies in space and time, sows are separated from their fellow pigs and confined to individualized gestation crates. At the same time, normalizing judgment is brought about by careful record-keeping of the weight and health of each pig and the stage in the breeding/reproductive cycle.

Foucault provides examples from prisons, barracks, hospitals, and factories. The hospital analogy (Dreyfuss & Rabinow, 1983) is important, especially for swine-raising, where confinement systems—particularly those based on the “all in all out” principle—are organized much like hospitals: They practice segregation, isolation, and sterilization to reduce the risk of disease under crowded conditions. Specialized farrowing rooms, nurseries, and finishing rooms segregate pigs at different stages of their life cycles. They are filled with pigs, then emptied, cleaned, and sterilized to make ready for the next batch. The notion of bio-power gives us insights into the physical disciplining and control of bodies in the interest of human society. The focus is on health, sexuality, and reproduction as much as on work and industrial production.

A problem with Foucault’s approach has been the lack of space for agency or resistance to develop in the face of industrial-scale discipline. There is no obvious way that social control, as represented by the panopticon, can be overcome. The danger of one dimensionality (Feenberg, 2000) is a dilemma for any understanding of human society, but it also applies to animal production. Surveillance and discipline can, and do, break down. Animals are sentient beings—bodies—made subject to considerable stress under the regime of intensive production. In the intensive swine industry, behavioral stereotypes—such as bar biting or tail biting—have led to additional efforts at control—such as tail docking at birth or the growing reliance on crates to maintain order by isolating and confining sows. Pigs, perhaps, have not been socialized fully to accept the disciplinary techniques that have been imposed on them.

Post-Humanism: Animals as Actants

To the comparative neglect of advanced technology and nonhuman nature, Foucault relies on social institutions for the production of human subjects. Post-humanism addresses this problem by bringing both technical artifacts and nature into its analysis. Post-humanism sees modern society as constructed of networks of humans and nonhumans organized into hybrids (Haraway, 1991; Latour, 1992, 1999). Nonhumans may be plants, animals, or technical artifacts. Technologies, integrated into continuous production systems, are employed to manage the vast assemblages of humans and nonhumans (Latour, 1999). A leading aspect of modern society, as Latour makes clear, is the extension of social relations to nonhumans. The premise of post-humanism is radically anti-essentialist in that the take-for-granted distinctions usually made between humans and nonhumans are leveled (Feenberg, 2002). Both categories hold the status of actants and may be more or less useful. To maximize industrial productivity, they are subject to reorganization and reconfiguration (Latour, 1999).

Latour (1999) characterizes modern agriculture as “internalized ecology” based on the “intense socialization, re-education, and reconfiguration of plants and animals” (p. 208). Technology plays a crucial role in this ongoing reconfiguration. Technology is used to replace human labor, animal labor, and even the contribution of nature in animal agriculture. On intensive hog farms, feeding systems, which mechanically bring flows of feed to pigs, and waste disposal systems, which hydraulically move flows of manure from the barns, reduce the need for effort on the part of both pigs and human workers. They also reduce the need for nature in the form of pasture (extensive agriculture), which formerly served as a source of feed and an outlet for waste. The emphasis on technical artifacts facilitates the analysis of such key aspects of modern animal agriculture as genetics, nutrition, pharmaceuticals, sow housing, and waste disposal. Advances in the identification of vitamins and the development of antibiotics were crucial in the success of large-scale indoor confinement systems. The strength of post-humanism is that it allows us to view modern animal agriculture as a hybrid—encompassing humans, animals, and technology. On the other hand, the radical anti-essentialism has been criticized for assuming a plasticity that obliterates any moral boundaries distinguishing human and nonhuman animals from machines (Feenberg,

2002). If we posit an interchangeability between sentient beings and machines, both merely actants in the assemblages in which they are embedded, then we are back to a mechanistic and reductionist perspective. There is little room for animal agency and sentience.

This is a difficult problem to unravel. Nature as actant is capable of some degree of independent action, rather than serving as just a plastic and malleable resource. Nonhumans can “strike back” (Latour, 2000) against efforts to control them. Modern animal agriculture can be viewed as a hybrid co-construction of human and animal actants and technical artifacts. This raises a question about the behavioral stereotypies that have bedeviled the intensive hog industry. Are they expressions of pig nature that so far have resisted complete human control? Pigs striking back? Or, do they represent a dysfunction in the technological assemblage, possibly amenable to a further technical fix? As we have seen, technical artifacts such as gestation crates and farrowing stalls have been introduced to combat some of these very behaviors. The concept of animal agriculture as co-constructed hybrid contains the potential for instability, even conflict.

Discussion: Discipline and Its Imperfections

All three perspectives suggest ways by which sociology can make a contribution to the understanding of the relationships between humans and domesticated farm animals under conditions of intensive confinement. They offer insight into the development of a “disciplinary society” (O’Neal, 1992) dedicated to the regimentation of docile and productive bodies. A system of discipline, reinforced by technology, has been developed in factories, schools, hospitals, and prisons and now has been extended to animal agriculture. Modern animal confinement systems—factory farms—borrow important principles from these institutions. Technologies substitute for the input of humans, animals, and nature to ensure continuous production—“pig flows”—in the case of the hog industry. Animals are fed and watered automatically; mechanical and hydraulic systems remove their wastes. Control is embedded in both physical structures such as sow housing and the production process. Furthermore, power is individualized and descending to achieve maximum concentration. Those on whom power is exercised—in this case, the sows—have been cut off from their natural sociability, isolated in individual crates, and

thus made subject more easily to surveillance and control. They have been crammed into ever-tighter spaces and more confining structures. Based on this strategy, as illustrated in its technical code, the Canadian swine industry has grown much larger and more concentrated since the 1950s, overcoming many of the economic and climatic obstacles to its growth.

Disciplining animals, however, is an imperfect process, subject to instabilities and uncontrollable factors. Disciplinary technologies imposed on livestock under intensive confinement do not abolish nature in the form of animal behavior; rather, they attempt to redeploy it and internalize its effects for maximum benefit to humans. Factory farms are human social constructions that recombine “nature’s dynamics to accomplish particular goals” (Murphy, 2004, p. 252). They are subject to failures, negative externalities, and even resistance on the part of animal actants. Nature—in this case animal bodies and behavior—cannot be assumed to be plastic, malleable, and easily subject to human agency; it has an agency all its own. Posthumanism, in particular, contributes to our understanding of these dynamics. It accords nonhumans the status of actants, capable of independent action, with the power to affirm or negate the disciplinary processes to which they are harnessed.

The development of stereotypies and related health and behavioral problems among confined pigs strongly illustrate the imperfections of the disciplinary process brought to bear on them. Despite decades of subjection to confinement and industrial discipline, pigs continue to show evidence of distress, misery, and even resistance. This is illustrated by aggression and the prevalence of oral and locomotor stereotypies such as bar biting and repetitive pacing.

Humans have implemented structures and technical barriers for the disciplining and regulation of pig herds. These actions, however, have interfered with activities and social structures normally associated with domesticated pigs. The result has been increased distress among confined sows, which has led to the imposition of more technical interventions of control, such as individualized gestation crates. The farrowing crate with bars is another technical confinement device that has not abolished the crushing of newborn piglets—the reason why it was introduced in the first place. These consequences, because of human actions and animal reactions, should raise questions about the utility of intensive industrial discipline as the major strategy for regulating pigs in Canada’s swine industry.

Conclusion: Toward Post-Discipline?

The concept of discipline has provided a sociological framework of analysis that allows researchers to draw the analogy between the regulation of humans in industrial society and the regulation of swine in intensive confinement. Following Latour, we can cross the culture-nature divide and understand that techniques developed for the organization of humans can—and will—be applied to nonhumans: in this case, confined livestock. This paper has applied three sociological perspectives on discipline to the treatment of hogs in the Canadian swine industry. Each perspective has been assessed in terms of its strengths and weaknesses as a lens for viewing the organization of modern animal production. The questions arise: How useful is the concept of discipline, developed in the social sciences, for comprehending the condition of animals who are products of industrialized agriculture? Can we go beyond mere analogy to something approaching understanding?

These important questions cannot be answered here. However, I can offer some suggestions. It is clear that the concept of discipline has been losing force as an organizational model for human societies. Post-disciplinary models stressing communitarianism (Etzioni, 1996), social orchestration (Deleuze, 1992), or reflexivity (Beck, Giddens, & Lash, 1994) have been gaining ground. Could these post-disciplinary approaches be having an influence over how we as humans view animal agriculture? Perhaps the animal rights movement can furnish at least a partial answer. On the one hand, animal rights activists have championed a protected status for animals as sentient beings, independent of human needs or utility. On the other hand, their most effective spokespersons long have recognized that only human support and involvement in human political processes can achieve rights for animals (Regan, 1985). This would mean a strengthening of public attitudes that reject the disciplinary confinement of livestock in the interest of cheaper meat for consumers. There are signs that this is starting to happen.

A reductionist and mechanistic ideology supported the legitimization of factory farming. This ideology viewed farm animals as little more than machines who could be made subject to human control and manipulation. As Fraser (2001) has suggested, the ideological support for the intensive confinement system of animal agriculture is starting to wane. Public attitudes in affluent societies seem less comfortable with instrumental and reductionist concep-

tions of farm animals. In both scientific and popular cultures, a growing body of opinion supports the connection between humans and animals at the emotional and physiological levels. Farm animals, though neither the companion animals beloved by middle class society nor the wild animals beloved by environmentalists, also have benefited from this trend. Increasingly, they too are seen as sentient creatures who experience the misery and pain of confinement.

There is an indication of a public shift in attitudes that is responding to these popular and scientific prompts. In 2001, the European Union, acting in response to a 660,000-signature petition from the European Coalition for Farm Animals, restricted the use of sow stalls, effective in 2013 (Compassion in World Farming, 2001). Under the new regulations, pregnant sows can be kept in stalls only for the first four weeks of pregnancy and must have access to straw or other manipulable materials. After four weeks in the stalls, the sows must be moved to group housing. Sow stalls already have been banned in Great Britain, Sweden, and Denmark. Attitudes in the United States also may be changing. A poll commissioned by the Humane Society of the United States (2001) found that 67% of Americans think we should treat pigs humanely. Only 25% said that inhumane treatment is a fair price to pay for inexpensive pork. Florida became the first state to ban sow stalls in a public referendum in 2003. Initiatives are under way to ban them in other states, including Maryland and Iowa. Prompts from animal actants, animal welfare activists, and scientific researchers are de-legitimizing the disciplinary techniques of intensive confinement in the hog industry in Europe. Will North America be next?

* Joel Novek, University of Winnipeg

Appendix

In the 1950s, undated CPS plans with the prefix B157 were published. In the 1960s, the other undated CPS plans consulted in this study were published. The following is a list of Canada Plan Service, plans consulted for this study.

Plan No Title

B157-3000 Danish Hog Barn

B157-3027 Single Row Hog Barn

B157-3037 Thompson Barn

B157-3046 A-Frame Colony House
B157-3048 Shed Roof Colony House
3008 Convertible Farrowing Pen with Front Creep
3112 Hog Barn, Farrow to Finish Pens, 1976
3017 One Room Continuous Farrowing System – 50 Sows
3021 4-Room Farrowing System – 100 Sows
3022 4-Room Farrowing System – 100 Sows, Front Creeps
3023 4-Room Farrowing System – 200 Sows
3043 Gestation Pen Stalls
3801 Farrowing Stalls with Side Creeps, 1977
M-3002 Site and Building Planning For Swine Production, 1987
M-3236 Breeding-Gestation Unit, Pen Stalls and Group Pens, 1984
M-3241 Two- Room Breeding and Gestation Unit, 1984
M-3303 Three-Room Farrowing, Three Room Weanling Unit, 1985
M-3304 Five-Room Farrowing, Five Room Weanling Unit, 1985
M-3311 4-Room Farrowing System 100 Sows, 1979
M-3700 Swine Manure Systems, 1989
M-3800 Farrowing Pens, 1980
M-3843 Gestation Pen Stall, 1984

Note

¹ Correspondence should be addressed to Joel Novek, Sociology, University of Winnipeg, 515 Portage Avenue, Winnipeg MB R3B 2E9, Canada. E-mail: j.novek@uwinnipeg.ca. This research has been supported by a grant from the University of Winnipeg. I also would like to thank the Editor of *Society & Animals* and two anonymous reviewers for their helpful comments and constructive criticism.

References

- Adcock, M., & Finelli, M. (1996). Against nature: The sensitive pig versus the hostile environment of the modern pig farm. *HSUS News* (Spring) 34-38.
- Baxter, M. R. (1989). Intensive Housing: The last straw for pigs. *Journal of Animal Science* 67 (9), 2433-2440.
- Beck, U., Giddens, A., & Lash, S. (Eds.), (1994). *Reflexive modernization: Politics, tradition and aesthetics in the modern social order*. Stanford: Stanford University Press.

- Beetham, D. (1991). *The legitimation of power*. Atlantic Highlands NJ: Humanities Press International.
- Bell, M. (1998). *An invitation to environmental sociology*. Thousand Oaks CA: Pine Forge Press.
- Braverman, H. (1974). *Labor and monopoly capital*. New York: Monthly Review Press.
- Clatton-Brock, J. (1994). The unnatural world: Behavioral aspects of humans and animals in the process of domestication. In A. Manning & J. Serpell (Eds.), *Animals and human society* (pp. 23-35). London: Routledge.
- Compassion in World Farming (2001). *Pig farming reforms hailed as massive step forward for animal welfare*. Posted June 19, 2001. Accessed December 6, 2004.
- Deleuze, G. (1992). Postscript on the societies of control. [*October*, 59, 3-7.](#)
- Deyoe, G. P., & Krider, J. L. (1952). *Raising swine*. New York: McGraw Hill.
- Dickens, P. (2002). A green marxism? Processes, alienation, and the division of labor. In R. Dunlap, F. Buttell, P. Dickens, & A. Gijswijt (Eds.), *Sociological theory and the environment* (pp. 51-72). Lanham MD: Rowman and Littlefield.
- Dreyfuss, H., & Rabinow, P. (1983). *Michel Foucault: Beyond structuralism and hermeneutics*. Chicago: University of Chicago Press.
- Edwards, R. (1979). *Contested terrain*. New York: Basic Books.
- Ekesho, I. (1989). Animal health implications as a result of future livestock and husbandry developments. [*Applied Animal Behavior Science*, 20, 95-104.](#)
- Etzioni, A. (1996). The responsive community: A communitarian perspective. [*American Sociological Review*, 61, 1-11.](#)
- Feenberg, A. (2002). *Transforming technology: Critical theory revisited*. Oxford: Oxford University Press.
- Fossey, D. (1983). *Gorillas in the mist*. Boston: Houghton Mifflin.
- Foucault, M. (1978). *The history of sexuality*, Vol. 1. (Robert Hurley, Trans.). New York: Pantheon Books.
- (1979). *Discipline and punish: The birth of the prison*. (Alan Sheridan, Trans.). New York: Vintage Books.
- Fraser, D. (2001). Farm animal production: Changing agriculture in a changing culture. [*Journal of Applied Animal Welfare Science*, 4 \(3\), 175-190.](#)

- Fraser, D., Mench, J., & Millman, S. (2001). Farm animals and their welfare 2000. In D. Salem & A. Rowland (Eds.), *State of the animals 2001* (pp. 87-99). Washington: Humane Society Press.
- Friedman, H. (1998). A sustainable world food economy. In R. Kell, D. Bell, P. Penz, & L. Faucett (Eds.), *Political ecology: Global and local* (pp. 87-101). London: Routledge.
- Goodall, J. (1971). *In the shadows of man*. London: William Cullins.
- Halverson, M. (2001). *Farm animal health and well being*. Minnesota Planning Agency, Environmental Quality Board. Posted April 23, 2001. Accessed August 25, 2003.
- (2000). *The price we pay or corporate hogs*. Minneapolis: Institute for Agriculture and Trade Policy.
- Hamilton, N. (1994). Agriculture without farmers? Is industrialization restructuring American food production and threatening the future of sustainable agriculture? *Northern Illinois Law Review*, 14, 613-637.
- Haraway, D. (1991). *Simians, cyborgs, and women: The reinvention of nature*. New York: Routledge.
- Harrison, R. (1964). *Animal machines: The new factory farming industry*. London: Vincent Stuart Publishers.
- Humane Society of the United States (2001). *Factory hog farming called inhumane*. Posted March 31, 2001. Accessed September 23, 2001.
- Jasper, J., & Nelkin, D. (1992). *The animal rights crusade*. New York: Free Press.
- Kunkel, H. O. (2000). *Human issues in animal agriculture*. College Station: Texas A&M University Press.
- Latour, B. (1992). Where are the missing masses? In W. Bijker & J. Law (Eds.), *Shaping technology/building society* (pp. 225-258). Cambridge: MIT Press.
- (1999). *Pandora's hope: Essays on the reality of science studies*. Cambridge: Harvard University Press.
- Latour, B. (2000). When things strike back. *British Journal of Sociology*, 57 (1), 107-123.
- Mason, J., & Singer, P. (1980). *Animal factories*. New York: Crown Publishers.
- Masson, J. M. (2003). *The pig who sang to the moon: The emotional world of farm animals*. New York: Ballantine Books.
- Merchant, C. (1980). *The death of nature: Women, ecology and the scientific revolution*. San Francisco: Harper and Row.

- Murphy, R. (2004). Disaster or sustainability: The dance of human agents with nature's actants. *Canadian Review of Sociology and Anthropology*, 41 (3), 249-266.
- National Research Council. (1980). *The effects on human health of subtherapeutic use of antimicrobials in animal feeds*. Washington, DC: National Academy of Sciences.
- Noske, B. (1997). *Beyond boundaries, humans and animals*. Montreal: Black Rose Books.
- Novak, J. (2003). Intensive livestock operations, disembedding, and community polarization in Manitoba". *Society and Natural Resources*, 16, 567-581.
- O'Neal, J. (1992). The disciplinary society: From Weber to Foucault. In P. Burke (Ed.), *Critical thought series 2: Critical essays on Michel Foucault* (pp. 157-173). Aldershot, UK: Scolar Press. (Reprinted from *British Journal of Sociology*. [1986] 37, 42-60).
- Phillips, P. A., & Fraser, D. (1993). Developments in farrowing housing for sows and litters. *Pig News and Information*, 14 (1), 51n-55n.
- Rabinow, P. (Ed.), (1984). *The Foucault reader*. New York: Pantheon Books.
- Rachels, J. 1990. *Created from animals: The moral implications of Darwinism*. New York: Oxford University Press.
- Regan, T. (1985). The case for animal rights. In P. Singer (Ed.), *In defence of animals* (pp. 13-26). London: Blackwell Publishers.
- Rhodes, V. (1995). The industrialization of hog production. *Review of Agricultural Economics*, 17, 107-118.
- Rollin, B. (2001). Farm factories. *Christian Century* (December 19-26), 26-29.
- Shiva, V. (1997). *Biopiracy*. Toronto: Between the Lines.
- Singer, P. (1991). *Animal liberation* (2nd ed.). New York: Avon Books.
- Statistics Canada (2001a). *Livestock statistics: Catalogue # 23-603-UIPE*. Ottawa: Minister of Supply and Services.
- (2001b). *Livestock statistics: Catalogue # 23-603-XPE*. Ottawa: Minister of Supply and Services.
- Stricklin, W. R., & Swanson, J. (1993). Technology and animal agriculture. *Journal of Agricultural and Environmental Ethics*, 6, Special Supplement (1), 67-80.
- Thompson, P. (2001). Animal welfare and livestock production in a postindustrial milieu. *Journal of Applied Animal Welfare Science*, 4 (3), 191-205.
- Thu, K. (1996). Piggeries and politics: Rural development and Iowa's multibillion dollar swine industry. *Culture and Agriculture*, 53, 19-23.

- (2003). Industrial agriculture, democracy and the future. In A. Ervin, C. Holtslander, D. Qualman, & R. Sawa (Eds.), *Beyond factory farming* (pp. 9-28). Saskatoon: Canadian Centre for Policy Alternatives,
- Thu, K., & Durrenberger, P. (Eds.). (1998). *Pigs, profits, and rural communities*. Albany: State University of New York Press.
- Turnbull, J., & Bird, N. (1981). *Confinement swine housing*. Ottawa: Agriculture Canada.
- Van Arsdell, R., & Nelson, K. (1984). *U.S. hog industry: Agricultural economics report #511*. Washington, DC: United States Department of Agriculture.
- Wilson, H. E., Stothart, J. G., & DeLong, G. E. (1951). *Swine production*. Ottawa: Department of Agriculture.
- Winner, L. (1977). *Autonomous technology: Technics out of control as a theme in human thought*. Cambridge: MIT Press.