

Pesticides, Parkinson's and Power

Jessica Seaver

*"A reliable rule of thumb is that chemicals that kill wildlife, especially birds and mammals, will also harm humans."*⁹

Pesticide use around the world has been widely debated and protested throughout the 20th century. Rachel Carson's *Silent Spring* brought the issue to the public in the early 1960s and the contention has only grown since then. Though the health risks of pesticide exposure compile an exhaustive list, one in particular has come to the forefront in the past decade: Parkinson's disease. A greatly studied condition in the scientific world, Parkinson's disease (PD) has proven to be elusive in its exact causes. However, studies have shown that it is characterized by degeneration in the nigrostriatal pathway and subsequent decreases in the levels of dopamine. So what is the connection between pesticides and Parkinson's disease? Recent research has shown a link between exposure to certain pesticides and the development of PD-like symptoms as a result of decreased dopamine. The continued use of known hazardous chemicals in the agriculture industry illustrates Michel Foucault's concept of "biopower," for the system is knowingly affecting the health of its citizens for the sake of the population as a whole. The increased prevalence of Parkinson's disease in those exposed to pesticides can be seen as a calculated risk in the process of easily maintaining agriculture output in the United States. In this paper, I will first briefly describe Parkinson's disease and the research showing a connection between PD and pesticide exposure. I will then outline Foucault's idea of "biopower" and examples of its use in history. Finally, I will illustrate how the continued use of dangerous pesticides demonstrates the modern implementation of "biopower."

Parkinson's disease is a neurological disorder with symptoms that include tremor, rigidity (muscle stiffness), akinesia (difficulty initiating movement or lack of movement), and postural instability or difficulty maintaining balance.⁴ As stated above, the condition has been linked to neural degeneration, specifically in the area of the brain known as the substantia nigra. The substantia nigra maintains numerous connections with motor centers and produces a neurotransmitter called dopamine. With the loss of cells in this area, the dopamine that normally relays messages to motor areas no longer functions correctly.⁴ This decreased motor efficacy results in the symptoms outlined above. Typically, PD is considered to be a condition associated with aging, as the average age of onset is around sixty years.⁴ However, the symptoms emerging in those exposed to certain pesticides do not seem to be dependent upon age.

The neurotoxicity of pesticides has been addressed in countless pieces of literature as well as formal studies over the past few decades. In *Silent Spring*, published almost fifty years ago, Rachel Carson explains that, "Both types of insecticides, the chlorinated hydrocarbons and the organic

phosphates, directly affect the nervous system..."³ She describes many examples of workers who have been affected, with symptoms ranging from tiredness to loss of memory to paralysis. In America the *Poisoned*, written twenty years later, Lewis Regenstein describes similar symptoms resulting from exposure to a pesticide called leptophos. "The workers...suffered partial paralysis, blurred vision, dizziness and other severe neurological disorders."⁹ These are just two examples of historical evidence pointing to the dangers of pesticides. So with this continuous accumulation of literature illuminating the harmful effects of pesticides, one would hope that the Department of Agriculture would implement a policy banning such chemicals. However, *Pesticide Toxicology and International Regulation*, released in 2004, contains a chapter entitled "Occupational Aspects of Pesticide Toxicity in Humans." This section outlines the most common pesticides used more recently in the agriculture industry and the resulting adverse effects. An example is that of organophosphorous compounds, chemicals that can cause such symptoms as convulsions, tremor and coma.⁵

The connection between Parkinson's disease and certain pesticides is commonly thought to relate to a substance called methyl phenyl tetrahydropyridine, or MPTP. MPTP was first discovered during a botched attempt to synthesize a homemade mind-altering drug. After injecting the substance, unaware that its chemical composition was not as expected, the users were admitted to the hospital with what looked like advanced PD.⁴ Paraquat, an herbicide used frequently in the U.S., shares a similar chemical structure with MPTP and has been studied for its connection with PD.⁵ Brooks et al., conducted a study in 1998 that showed a significant, dose-dependent decrease in dopaminergic (dopamine-producing) neurons in the substantia nigra in response to paraquat exposure in mice.² As would be expected, the loss of these neurons resulted in reduced motor function. This study, along with many others showing similar results, is solid data substantiating anecdotal evidence of illness and suffering going as far back as *Silent Spring*.

With this information, it would seem that the Department of Agriculture would have no choice but to take pesticides with paraquat (along with many other chemicals linked to PD) off the market. However, this is not the case. An article released by the National Institutes of Environmental Health Services explains that, "Paraquat use has long been restricted to certified applicators,"¹ indicating that it is still utilized in at least the professional world. Though the chemical is listed

Jess Seaver is a staff member of TuftScope and a senior at Tufts.

under the “restricted use” section, clearly there still remain workers in the agriculture industry who are handling it and are thus being exposed to its harmful physical effects. The absence of interference on the part of the U.S. government illustrates Michel Foucault’s idea of “biopower.”

Foucault’s concept of “biopower,” put simply, is control over a person or group. He connected this notion to things like sexuality, racism, and nuclear war to illustrate the key factor of state intervention in the lives of citizens. As Paul Rabinow explains in *Biopower Today*, “At its most general, then, the concept of ‘biopower’ serves to bring into view a field comprised of more or less rationalized attempts to intervene upon the vital characteristics of human existence.”⁸ Specifically with regard to general health of the people, Foucault argued that administrative power was inherently bound to control over their physical lives. Adriana Petryna elaborates on this point in *Life Exposed* by saying that, “Health was recast in the service of the state; the capacities of individuals were to be maximized inasmuch as those individuals lived, labored, and reproduced within a given territory and ruling apparatus.”⁷ Under the idea of “biopower” are two repercussions pertinent to the continued use of harmful pesticides: hierarchy and the redefining of suffering.

Embedded Foucault’s “biopower” is a consequent formation of hierarchy. In his own writings, Foucault references racism in U.S. history and the Holocaust as byproducts of such hierarchies. Both rested on the principle that one group was inferior to another and was treated in a way that reflected such a belief. Within the issue of poisonous pesticides is the same type of notion, specifically regarding the health of U.S. agriculture employees. Their general welfare is being exploited in order to provide consumers with food at the lowest production cost possible. The system is, to use Rabinow’s phrasing, intervening upon essential traits of these workers, in this case those of physical health and well-being. The government deems it acceptable to sacrifice them in the name of meeting consumer demand.

The government’s approval of physically harmful pesticides in farming illustrates an inherent redefining of suffering. By allowing the use of chemicals like paraquat, officials are declaring that any resulting illness or injury is a consequence of the user’s own actions. After all, the label dictates proper safety measures to prevent physical harm. However, even with the use of suitable equipment, many cases of pesticide poisoning are reported each year as a consequence of differing reactions to exposure. The truth is that evidence points to the fact that the harmful effects of pesticides are by no means uniform across different people or varying timelines. Linda Nash, author of *Inescapable Ecologies: a History of Environment, Disease, and Knowledge*, illustrates this point when she explains that, “The absorption of pesticides

by a given individual varied with work rate, work style, personal habits, and the type of clothing worn.”⁶ So the reactions of each individual, the way in which he or she suffers, cannot be held to a standard definition. However, the action of the EPA to report an allowable concentration of any particular chemical implies just that type of thinking; suffering is delineated by a specific set of official boundaries. In the relation to “biopower,” Petryna states that, “Given the array of scientific and medical uncertainties, old measures of suffering lose their meaning and validity.”⁷ Workers who develop symptoms of Parkinson’s disease after two years of spraying pesticides are dismissed because their suffering does not fall into the concretely-defined category outlined by the system.

The use of pesticides like paraquat, shown in several studies to be linked to Parkinson’s disease, illustrates Foucault’s concept of “biopower,” in that the system is demonstrating control over the physical lives of citizens. Such control can be seen in the hierarchies formed through the sacrifice of workers’ health as well as the rigid boundaries placed on “accepted” forms of suffering. Though much progress has been made in the regulation of pesticide use over the years, there are clearly still flaws in the system that need to be addressed. Parkinson’s disease is a highly debilitating condition that is known to lead to continued and irreversible degeneration of the nervous system throughout life. While those involved in the system of agriculture in the U.S. admittedly must consider the economic consequences of any change in procedure, they must also acknowledge the value of a healthy life.

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