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The Corporate Crimes of Dow Chemical and the Failure to Regulate Environmental Pollution

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Abstract A case study of Dow Chemical Company using scholarly research, journalistic investigations, and government documents reveals the existence of the criminogenic corporate-state. The Corporate-State manages and regulates itself with limited interference from the Environmental Protection Agency and in the form of Dow Chemicals is responsible for numerous environmental crimes both nationally and globally all of which have been linked to numerous health, labor and economic problems. Future researchers are encouraged to undertake similar case studies to expose the Corporate-State and the criminal harms done to ordinary citizens for the sake of profit.

Introduction

This paper aims to develop a model for explaining the crimes of the corporate-state, building on the theoretical work of Kramer et al. (2002) as well as Pearce and Tombs (1996, 1998) on the safety crimes of the chemical industry. As defined by Kramer et al. (2002:271): "State-corporate crimes are illegal or socially injurious actions that result from a mutually reinforcing interaction between (1) policies and/or practices in pursuit of the goals of one or more institutions of political governance and (2) policies and/or practices in pursuit of the goals of one or more institutions of economic production and distribution." They also explain that state-corporate crime takes one of two forms, state-initiated and state facilitated. Proposed here is the hypothesis that the corporation has become the initiator of corporate-state crime or that it is the corporation that manages and regulates the state through its control over state behavior before, during and since the inception of this current economic crisis. More specifically it is proposed that *environmental pollution and cancer are results of corporate state action even when they may appear the result of state*

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inaction. Corporate-state action aims to increase economic and political hegemony resulting in environmental pollution and high cancer mortality rates. The paper therefore also makes a contribution to the 'green criminology' literature concerned with crimes against the environment (Beirne and South 2007). The history of Dow Chemical provides the case study at the heart of this paper.

Method

Examining Dow Chemical operations across the globe and nationally will be accomplished by utilizing a variety of sources including Transnationale.org, a private non-profit watchdog organization that compiles financial, environmental, and criminal information, on a variety of corporations for nominal fees. Other web-based search engines also were utilized to compile data, including a legal news search engine provided through Lexis Nexis and EBSCO full text using the key words 'Dow Chemical Company' and 'pollution'. The US EPA's web page news releases also were explored to uncover pollution incidents, superfund cases, and enforcement actions as well as Dow's relationships with other government agencies.

Dow Chemical

Dow Chemical was incorporated in 1947 under Delaware state law and succeeded a Michigan corporation of the same name founded in 1897. It merged with Union Carbide on February 6, 2001 and subsequently Union Carbide became a wholly owned subsidiary of Dow. This information is provided on Form 10-K, registered with the United States Securities and Exchange Commission for the Fiscal year ending December 31, 2005, Commission File Number 1-3433, and this registration form also outlines all of Dow's operations and products both nationally and globally (United States Securities and Exchange Commission, Washington, DC 2005).

Dow manufactures and sells chemicals, plastic materials, agricultural and other specialized products and services. However, accounts of operational details differ. In 2005, the company claimed that it had annual sales of forty-six billion dollars, employed forty-two thousand people with customers in one-hundred and seventy-five countries, and had one hundred and fifty-six manufacturing sites in thirty-seven countries producing thirty-two hundred products. On the other hand, investigative journalist Jack Doyle has reported that Dow operates in two hundred and eight countries on six continents (Doyle 2004), while Transnationale.org revealed Dow operates in two-hundred and thirty-three countries and took advantage of tax havens, shell companies and secret banking operations (Transnationale.org 2007; see Table 1). Dow owns thousands of patents for chemicals, plastics, hydrocarbons, and energy across the globe, and they are principal owner of a number of other companies headquartered from Argentina to Kuwait and Thailand (see Table 2).

Dow claims that their foreign operations carry no greater risks than operations in the US, although environmental regulations in non-western non-democratic nation-states or nations in transition are typically weak or non-existent and the US EPA has no power or authority to regulate Dow's actions outside the United States. In fact, Dow remains a global economic power with more financial resources than the agency that is supposed to regulate it. Doyle (2004) provides a journalistic exposé of Dow's long history of criminal harm to the environment and humans. Similarly, Palmer (2007) describes Dow's role in the creation of Agent Orange. Dow first began to produce an herbicide called 2-4-D during WWII at the University of Chicago with most of the subsequent research at Fort Detrick.

Table 1 List of nations where Dow Chemical Corporation has one or more companies operating (www.transnationale.org 2007)

Venezuela
Uruguay
Switzerland
Sweden
Singapore
Russia
United Kingdom
Portugal
Netherlands
Paraguay
Panama
Mexico
Malaysia
Jersey
Japan
Italy
Ireland
Indonesia
British Virgin Islands
US Virgin Islands
Cayman Islands
Mauritius
Hong Kong
Guernsey
France
Spain
Costa Rica
South Korea
Columbia
China
Brazil Bermuda
Belgium
Barbados
Australia
Argentina
South Africa
Germany

At this Army post the chemical's utility as a military weapon was investigated. Subsequently, in the 1950s, both 2-4-D and 2-4,5-T were produced as herbicides, allegedly aimed at killing weeds. However, in the 1960s Dow returned to developing these substances for use as the main ingredients in Agent Orange, the toxic defoliant used during the Vietnam War. Palmer (2007) refers to this substance as TCDD, a form of Dioxin, a known carcinogenic substance.

Substantively, Dow became embedded with the federal government as a result of an alliance to produce a weapon, or in the language of the government, the company became

Table 2 Dow Chemical principle holding companies globally

Company	Country	Percentage owned
Compariia Mega	Argentina	28
Dow corning	US	50
Equate petrochemical		
K.S.C.	Kuwait	42.5
Equipolymers	Switzerland	50
MEGlobal	England	50
OPTIMAL olefins	Malaysia	23.75
OPTIMAL glycols	Malaysia	50
OPTIMAL chemicals	Malaysia	50
OPTIMAL Siam		
Group	Thailand	49

integral to national security, necessitating a comfortable mutually beneficial relationship. Millions of gallons of this herbicide were sprayed over ten to sixteen percent of the land of former South Vietnam. As many as 2.1–4.8 million people were sprayed from 1961 to 1971 (Palmer 2007; Mead 2008). This substance can settle in the soil and waterways and bio-accumulates as it moves up the food chain (Palmer 2007). The long term effects of Agent Orange have included cancers and birth defects among veterans and their children and among Vietnamese citizens and their children. In 1991, the federal government passed the Agent Orange Act, mandating that veterans suffering from any Agent Orange diseases would receive disability payments and healthcare benefits (Palmer 2007). By 1999, Vietnam reported that 10 million persons were suffering from the effects of Agent Orange. There is evidence that some of the chemicals may still be present in airplane ruins or on former US bases. In 2008, a National Academy of Sciences report concluded that Agent Orange induced tumor cell growth by directly affecting the mitochondrial DNA machinery. The levels necessary to begin such growth are quite low and substantially under what had been previously defined as toxic (Mead 2008).

Agent Orange is part of a longer history of concerns related to Dioxin which, by the 1950s, had become a common household product in the form of Saran Wrap, a plastic wrap advertised for use as a common household product. Saran Wrap is a chlorinated plastic and emits the toxin Dioxin when burned. Dow has since ended most of its consumer sales of such products and now focuses primarily on bulk chemical sales although it remains a major user of all forms of chlorinated chemical products and one of these, the organochlorides, are the most persistent and toxic, leading some governments to attempt to phase them out completely (Doyle 2004). Dow produces about thirteen percent of all the chlorine based products used across the globe as well as napalm and polyvinyl chloride (or PVC). These substances are used to make vinyl flooring, computers, and Styrofoam containers. In 2004, the Multinational Monitor named Dow as one of the ten worst corporations of the year (Mokhiber and Weissman 2004). The Monitor previously listed twenty serious chemical crimes for which Dow has remained non-accountable including the creation of Agent Orange and Napalm (Table 3).

Dow's SEC 10 K form also reveals that they are in the property and casualty insurance and reinsurance business—providing a viable method of insuring profits and avoiding legal quagmires. Pearce and Tombs (1996) noted that giant chemical companies were becoming higher risks to insure, because as their environmental violations grew more numerous, their

Table 3 The Monitor's list of twenty of Dow's most serious chemical crimes

1. Bhopal, India disaster
2. Saran Wrap
3. Brain tumors in twenty-five workers from Dow's Freeport, Texas plant, twenty-four workers died
4. Numerous company fires at its facilities including one in a Pittsburgh facility where two workers were killed and forty-five injured
5. Before the law on informed consent and the prevention of experimental work on prison inmates, Dow conducted the Holmesburg Experiments in 1964 on seventy prison inmates to test the effects of dioxin, now a known cancer causing toxin. In 2001, Dow was the one of the top ten producers of Dioxin (Sun Media 2003)
6. Dow's pollution across the globe goes back to its birth 100 years ago
7. Dow's operation in the Brazos River in Freeport Texas has sent more than 4.5 billion of gallons of wastewater per day into the river and into the Gulf of Mexico
8. Polluting of the Tittabawasee River in Midland, Michigan
9. Dow chemicals are used in a number of plastic toys across the toy industry
10. Dursban is produced by Dow and is a toxic pesticide known to have negative effects on the nervous system. Iit replaced DDT after it was banned in 1972. The EPA finally forced Dursban off the market at the end of 2004
11. DBCP is the active toxic ingredient in the Dow pesticide called Fumazone. It has been shown to lead to sterility among men who worked with the chemical
12. The key ingredient in Silicone breast implants was a product that resulted from a joint venture between Dow and Corning that killed a number of women
13. Dow has been a huge union buster as far back as 1967 when at that time Dow's production workers were unionized
14. 2,4,5 T the active ingredients in Agent orange. It was not until 1983 that Dow stopped making 2,4,5, T. Production was stopped in New Zealand in 1987. Litigation continues
15. Perchloroethylene, or PERC, is a hazardous substance used by dry cleaners everywhere, Dow has undermined safer alternatives
16. Chlorine has been produced by Dow using the Mercury cell method since 1947. The mercury was recycled but much has been emitted into the air and water as well as in other products. Researchers have found high levels of mercury in fish from the St. Clair River in Ontario and in Michigan as well as within fish in the Detroit River, Lake Erie. Dow was sued by state and local officials
17. 2,4-D originally an Herbicide was used as a key ingredient in Agent Orange. 2,4-D is remains the most widely used herbicide in the world
18. In March, 2001, the CDC released information that most people in the United States have detectable levels of plastics, pesticides, and heavy metals in their blood and urine
19. Rocky Flats Colorado was a top secret Dow Chemical plant from 1952 to 1975 and remains an environmental problem in the Denver area
20. Napalm, Agent Orange, and jellied gasoline was used in Viet Nam and may be what made Dow Chemical began to adjust its Public Relations campaign and try to re-define itself

premiums went up. However, if the company could maintain their own liability and insurance companies, then they could protect their profit margin and keep premiums down. Pearce and Tombs argue that this allows them to ignore safety, a first order cause of chemical company crimes. Dow outlines its risk avoidance strategy:

> The Company is subject to legal proceedings and claims arising out of the normal course of business. … Dow has an active risk management program consisting of numerous insurance policies secured from many carriers. These policies provide coverage that is utilized to minimize the impact, if any, of the legal proceedings.

> The required reserves may change in the future due to new developments in each matter. … (10-K Report, Litigation-Critical Accounting Policies p. 43, 2005).

The language "normal course of business" and being "subject to legal proceedings and claims" minimizes Dow's responsibility for environmental crimes and erases cancer victims' suffering. Dow's conduct of an actuarial analysis is a fiscal process that de-humanizes and objectifies their victims not unlike the cognitive process an ordinary criminal engages in as they commit offenses. In another section of the 10-K report entitled "Environmental Matters", the company states: "In the case of landfills and other active waste management facilities, Dow recognizes the costs over the useful life of the facility". This social construction of language presents their "Facilities" as aging naturally, thus absolving the company of management responsibility for the maintenance of the facility. Dow acknowledges that they had "accrued obligations" of three hundred and eighty million dollars by December 31, 2004 for "environmental remediation and restoration costs, including forty-five million dollars for the remediation of Superfund sites." The vernacular use of the words 'remediation' and 'restoration' might refer to repairing the damage done to a historic painting or artifact but are not terms appropriate for use in describing repairs to a damaged planet. Furthermore, notably absent are the words crime or harm or even pollution and—of course—cancer mortality and human suffering. This section on "Environmental Matters" also reports the total amount spent on environmental clean-up at two sites. One is located in Freeport Texas, where Dow spent ninety million dollars from activities beginning back in the 1940s through the 1970s up to 2005. The other site is located at the Tittabaswassee River in Midland, Michigan, the site of Dow headquarters, where they have expended eighty-four million dollars on a Hazardous Waste Site which they are licensed to operate. Dow began dumping chemicals into the flood plains of the Tittabaswassee River in Midland Michigan in 1915 when it began producing chlorinated phenols (Mokhiber and Weissman 2004). Dioxin can now be found twenty-miles down the river from the original Dow dumping location.

Dow is already 100 years old and is a chronic life-course persistent offender, similar to those exposed in Sutherland's (1983) notable work, first published over 50 years ago. Dow has chronically environmentally raped the same locations for the last 60–90 years and more recently betrayed the community by cutting jobs. Dow Chemical Company has been involved in pollution incidents, court cases and enforcement actions brought by various agencies. For example, Dow violated the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) in 2000 and the EPA issued a default order with the respondent (perpetrator) being Dow Chemical (EPA Default Order 2000; Docket No. EPSCRA 09-99-0030, FIFA-09-99-025). However, formal proceedings against Dow began in September 1999 when the EPA charged Dow with three violations of FIFRA, for failing to submit reports with mandated information as required by the FIFRA as well as nine violations of the Emergency Community Right to Know Act of 1986 (EPCRA). The latter occurred when Dow failed to accurately report the amount of toxic chemicals it manufactured, including the pesticide Lorsban, processed and otherwise used in 1994, 1995, and 1996. These regulations were violated at the Pittsburg Pesticide factory in California where Lorsban was produced. Another toxic chemical called ethylene glycol was also utilized above the maximum threshold in 1994. Dow underreported its offsite transfers of the chemical by over two hundred thousand pounds. All together Dow was fined for twelve separate counts of violations of environmental regulations. Other toxic chemicals that the company used illegally included chlorodiflluoromethane, styrene and carbon tetrachloride. It also underreported fugitive air releases of carbon tetrachloride by three thousand pounds as well

as processed trichloroethylene and N-methyl-2-pyrrolidone in excess of thresholds, also underreporting offsite transfers. Finally, Dow illegally produced and underreported offsite transfers of two other chemicals, ethylene glycol and nitrapyrin. The EPA fined Dow one hundred thousand dollars, a mere pittance as a proportion of Dow's profits and clearly symbolic punishment at best. Subsequently, Dow replied to the default order denying that it had violated these laws and both parties were scheduled to meet and participate in "Alternative Dispute Resolution" processes to settle the case. While this may sound like restorative justice for the corporation this is not the case because the corporation does not have to acknowledge fault and victims are not present. Four months later, with no resolution reached, Dow agreed to perform two supplementary environmental clean-up projects to mitigate any penalty imposed by the EPA but failed to comply by denying awareness of deadlines. In the end Dow agreed to the terms of an EPA proposed Consent Decree but was fined for failure to submit documents in a timely fashion. A fifteen thousand dollar fine again seemed an empty, symbolic gesture. As a corporation Dow knows that it can afford to violate the law because the fines imposed will have no impact on its operations, market value or profit.

Global Crimes

Dow is a successful global operator, a strategy which enables it to evade oversight by the US EPA. This global presence is characterized by pollution offenses and in response the organization has begun to encounter some degree of resistance from citizens within the developing world. In 2002, Greenpeace disclosed that a Dow factory in Choorkop, South Africa produced chemicals that posed a threat to residents' safety in the nearby town of Thembisa. Greenpeace subsequently helped to stage a protest (South African Press Association 2002). Prior to the protest, waste water samples taken from the plant revealed the presence of a number of persistent toxic chemicals including chloroform, tetra chloromethane, chlorinated benzenes and alkenes and the pesticide called Linden. Protesters also complained that Dow regularly sold Dursban in South Africa. Dursban is a pesticide containing a neurotoxin suspected of disrupting endocrine functioning. It was a commonly used pesticide in the US that was later found to cause neurological damage in children. Moreover, in 1995 in the US, Dow was fined seven hundred and thirty-two thousand dollars for failing to disclose reports of the adverse effects of Dursban. Subsequently, Dow entered into a voluntary agreement with the US EPA to remove Dursban from over-the counter products by the end of 2000 but successfully pressured the EPA to avoid a total ban. Dow still uses the chemical in a variety of agricultural products in the US and globally. South African environmental protestors also demanded that Dow provide total transparency about all the persistent toxic chemicals it produces. Greenpeace called upon governments around the world to end environmental abuses and develop an international human rights treaty that would force transnational corporations to attend to human rights issues related to environmental safety. Dow probably will not become a good global corporate citizen until such a treaty is developed and ratified with enforcement powers granted to the International Criminal Court.

During 2003, the Bush administration resisted an EU initiative to begin its' own testing program on US chemical products. The US government was represented by Dow Chemical, Rohm and Haas Co. and Lyondell Chemical Company as well as a variety of trade groups. Wall Street Journal reporters indicated that EU environmentalists were angry, claiming that US policy allowed dangerous chemicals like PCB's (also produced from the production of plastic) and DDT (a pesticide) to be used for decades after their cancer

causing potential was exposed. Moreover, while US companies had volunteered in 1998 to test three thousand volatile chemicals for environmental and health hazards, by 2005 thirty-thousand chemicals still existed that predated testing requirements under the Toxic Substances Control Act of 1976. The E.U.'s proposed program would have cost companies from $1.6 to $7.8 billion over the next 11 years to begin mandatory testing of these chemicals. The expected human benefits were lower health care costs of between $18 and $54 billion dollars over the next 30 years. The American Chemical Council (an industry consortium) complained that the proposal would cost US companies $8 billion dollars over the next decade although the consortium could have contributed for the industry thus lowering the cost for each company. The Wall Street Journal report argued that the E.U. program goal was to push US industry out of an E.U. market into which Dow currently exports $30 billion dollars worth of chemicals annually (Herrick et al. 2003).

Dow's pursuit of profit over the value of human life is further illustrated by its acquisition of Union Carbide after one of the worst safety crimes of the twentieth century at Bhopal, in which eight thousand died initially and twelve thousand have died subsequently (Deutsche Presse-Agentur 2002). Dow acquired Union Carbide in February 2001 and in 2002 filed a $10,000 law suit against women activists from Bhopal because they were demonstrating in front of Dow's Mumbai headquarters demanding assistance in cleaning up the toxins that remained on site at Bhopal (Canadian Business and Current Affairs 2003). Two years later Dow was continuing to refuse to take part in the environmental cleanup (Financial Times 2004c). By early 2004, only $182 million had been paid of the $615 million dollar settlement between Union Carbide and the Indian government (Sun Media Corporation 2004). The Indian Supreme Court ordered the government of India to distribute the remaining $432 million dollars to the surviving victims. Allegedly, the Indian government was reluctant to distribute the money due to difficulties in categorizing and identifying victims and it appears that motives for this were aligned with the government's primary goal of continuing to facilitate foreign investment. In November of 2004, the Indian government began re-distributing money from the settlement to one hundred and five thousand persons (Financial Times 2004a). Subsequently, Amnesty International released a report called, "Clouds of Injustice" calling upon the Indian government to release twenty different study results reviewing the effects of toxins released by Union Carbide/Dow at Bhopal (Financial Times 2004b). The Indian Council of Medical Research initially conducted this research but discontinued their work in 1994 without explanation although a technical report was released in 2004 concluding that the Indian government and Dow were both responsible for failing to support and compensate the victims. All medical expenses were supposed to be covered by the settlement, however, only sixty-one percent of the compensated funds were used to pay for medical expenses. The International Campaign for Justice in Bhopal also demanded that Dow Chemical provide the funds for the medical treatment of survivors (Deutsche Presse-Agentur 2004). It appears that both the Indian government and Dow have profited from Union Carbide's mistakes at the expense of victims lives by neglecting these payments. One news report (Financial Times 2004b), refers to the Bhopal incident as the Hiroshima of the Chemical industry:

> On the night of December 2 [1984], families in Bhopal were awakened in the middle of the night by terrible burning in their eyes and lungs. Within minutes, children and mothers and fathers staggered in the street, gasping for air. As they ran in complete terror, someone yelled that the Union Carbide pesticides factory had exploded, spewing out poisonous gas throughout the city. Soon thousands of people lay dead in

> the city's main roads, with every truck, taxi and ox cart weighted down with injured and terrified refugees. No one in the emergency room at the hospital knew what the toxic gasses were or how to treat the flood of patients. By the morning, more than 5,000 people were dead, while a half million more were injured. Bhopal has rightly been called the Hiroshima of the Chemical Industry. ….Fifty thousand are disabled due to injuries. The abandoned factory site remains essentially the same as the day that Carbide's employees ran for their lives. Sacks of unused pesticides lay strewn in store-rooms, toxic waste litters the grounds and continues to leak into the neighborhood water well supply.

In 1994 an arrest warrant was issued for the former CEO of Union Carbide, Warren Anderson, but the Indian government failed to secure extradition perhaps because to do so would make the investment climate too hostile to transnational corporations. This became even more obvious when in January, 2007 Indian government officials began making plans for a new Dow investment in India—to the disappointment of the survivors of Bhopal (Financial Times 2007a). Interestingly, in February 2007, 23 years after the Bhopal disaster, the US Securities and Exchange Commission penalized Dow with a $325 thousand dollar fine to settle the charge that one of its subsidiaries DE-Nocil Crop Protection Limited made "improper payments" to Indian government officials. Corruption has led to on-going pollution in India as it has in many other developing nations while the corporate-state protects corporations' profit margins as illustrated by the minimal amount of the fine. This settlement included an agreement that Dow would not be charged with a violation of the Foreign Corrupt Practices Act and Dow could continue to deny that it committed any wrong-doings. Apparently, DE-Nocil paid about $200 thousand in bribes to Indian officials for registering its products between 1996 and 2001. This is a violation of the US federal criminal law. Ultimately this only cost Dow around $500 thousand (Financial Times Information 2007b)—a case of corruption greasing the wheels of environmental pollution and exemplifying the operation of the corporate-state.

In May 2007, the Indian Prime Minister finally agreed with protesters and activists to provide safe drinking water, complete a scientific assessment of the contamination around the abandoned factory now belonging to Dow, memorialize the Bhopal tragedy in the form of education, create a national day of mourning, and convene a national commission to allocate more funds for health care. The Prime Minister also agreed to explore legal options to hold Dow accountable for the on-going negligence of the property at the site. The Prime Minister refused however to institute a national ban on Dow products.

A New Image?

In 2004, Dow generously donated six million Chinese Yuan (US $724,000) over a 3 year period to aid China's weak and ineffectual environmental protection efforts. The fine print also reflects a letter of intent from Dow to assist ten to twenty of China's chemical related industries in a project to "improve their production and management system to achieve China's goals in its 'Cleaner Production Program'". It is ironic that China has selected one of the dirtiest chemical companies and one of the most prolific polluters on the planet to help them clean up and expand their own dirty industries. Of course, this is likely to mean China's dirty industries will remain pollution producers.

Dow had already expanded its base across China in 1999 through its purchase of Angus Chemical Company which has manufacturing facilities in the US and Germany. In China, Angus will be involved in paints, personal care and cosmetics, leather, metalworking

fluids, life sciences, and rubber while Dow Biocides, another unit of Dow, will focus on microbial 'challenges' during the production process. 'Challenge' here translates into 'problems with safety'. A Dow spokesperson reported that the company aimed to make China the second largest producer of chemicals after the US by 2015: 'We wanted to be more involved in China's economic development, not only for acquiring market share, it's not just the low cost of products here, but China itself…developing the market' (Financial Times Information 2007c). Dow is extending its power base and influence, not just its profits. One year after the project began, Dow's efforts, not for China but for Dow, paid off. Their revenues in China in 2005 topped 2.3 billion dollars. However, as part of their on-going project of image re-invention, the Financial Times reported that Dow's program in China has helped reduce wastewater by over three million cubic meters, gas emissions by over five hundred tons, liquid waste by over four hundred tons and solid waste by over four hundred tons. These efforts to improve and increase production will result in over twenty-nine million dollars profit annually. China is now Dow's third largest market after the US and Germany (Financial Times 2006).

Dow's efforts to re-define itself includes making food packaging that changes color when food is spoiled, biodegradable plastic wrap made from corn, a new kind of 'technology' (i.e., 'chemical') for plastic food wrap that detects the presence of bacteria, plastics made from plants instead of petroleum, and a pill made from the immune boosting protein in milk. The plastic made from corn is the result of a joint venture between Dow and Cargill Inc., called Natureworks, that is already selling its product in Europe and Asia. However, this last product (and possibly others listed above) has not yet undergone any clinical safety trials. Dow continues its deviance.

In 2003, in South America, Dow Chemical was ordered by a Nicaraguan court, along with several other corporations including Shell Oil and Standard Fruit (Dole Fruit in the US), to pay four hundred and ninety million dollars in compensation to five hundred and eighty-three banana workers injured by a toxic soil fumigant chemical called Nemagon that resulted in the sterilization of thousands of Central American banana workers (Ling and Olson 2003). This pesticide allegedly controls rootworms but it also has been documented to cause depression, impotence and is suspected as a leading cause of stomach cancer in humans. The pesticide's active ingredient is called DBCP or Dibromocholoropropane, labeled as extremely hazardous and classified as 'Discontinued' by the World Health Organization. The chemical nematicide was first produced in the late 1950s by Dow and Shell. Both companies had evidence then that DBCP reduced sperm counts and atrophied the testicles of rabbits and monkeys but neither company revealed that information at the time. In 1964, the US government approved the chemical for commercial use. Again, the companies remained tight lipped about the chemical hazards. By the early 1970s over eleven million kilograms of Nemagon was produced annually and Standard Fruit used it most often in Central America. In 1977, the workers and their Union at a plant in California identified the first human sterility cases linked to DBCP. Subsequently, the chemical pesticide was banned in the US but the company continued to supply exports to Standard Fruit in Central America. In the early 1990s, 16,000 banana plantation workers from Costa Rica, Ecuador, Guatemala, Honduras, Nicaragua and the Philippines filed a class action lawsuit in Texas against a number of US fruit and chemical companies asking for compensation for permanent sterility linked to DBCP exposure. In 1997, four chemical corporations that produced DBCP, Amva, Dow, Occidental and Shell agreed to pay $41.5 million in an out of court settlement. Divided among sixteen thousand workers that is not a large payout (Ling and Olson 2003). However, by July 2003, newspaper reports indicated that a separate Nicaraguan court had ordered the companies to pay $489 million dollars to

four hundred and fifty workers exposed to this pesticide (Epson 2003). As this long saga illustrates, despite attempts to re-construct their image, Dow continues to cause disease and death and pay limited damages while making exorbitant profits. Along the way, the US EPA has been usurped by the chemical industry, creating a living breathing corporate-state.

In January, 2007, Dow Chemical and a number of other transnational companies joined together to call for a government mandated nationwide cap on pollution to limit global warming. It is ironic that these companies should appear to be asking for government mandated caps, reflecting not the capture of the EPA but rather the colonization of the state (Chipman 2007). As a further irony, Dow's dousing of humanity and other living organisms with pesticides has opened a new niche for the company in the bottled water business (Deutsch 2006). This is an extremely lucrative arena for a company that is destroying the integrity of the natural water supply. Once again it is all about profit as the general manager of Dow's Chemical Water's Solution Unit explained: 'Of course we're investing significantly in the water business', worth $150 billion in the US in 2010 and particularly significant as the US EPA predicts that thirty-six states will be suffering from water shortages by 2013 (Deutsch 2006).

Conclusion

Since WW II, Dow Chemical Corporation and the US government have developed and maintained a long-term, mutually rewarding, symbiotic relationship in order to accumulate political and economic hegemony under the guise of national security and international developmental assistance resulting in transnational corporations not being held accountable for numerous environmental crimes. In order to pursue such accountability, four objectives must be accomplished. First, future research must continue to conduct case studies of the chemical and oil industrial complex and the new transnational corporate-state. Secondly, the new International Criminal Court must be empowered to prosecute transnational corporations for crimes against humanity. This necessitates a revision of the Rome Statute in order that the Prosecution can investigate and turn such cases of environmental pollution over to the Judicial Branch for trial. Sentencing must become innovative and include swift victim restitution and medical treatment in conjunction with re-training employees who may suffer the repercussions of downsizing resulting from the company's loss in stock value and profits. This would also include sizable severance packages so that companies like Dow will be unable to transfer their loss of profits down to their employees. Thirdly, transnational corporations must be re-structured and divorced from their complicit partners, the state regulatory agencies. This may require an amendment to the constitution clearly outlining that separation. Finally, this author also hopes that the current (2010) disaster in the Gulf of Mexico will empower a grass roots social movement and provide the conditions in which some of these objectives can be met.

References

Beirne, P., & South, N. (2007). *Issues in green criminology confronting harms against environments, humanity and other animals*. Devon, UK: Willan Publishing.

Canadian Business and Current Affairs. (2003). Micromedia Limited. New Internationalist Publications Ltd. New Internationalist. July, 2003 http://wwws.morehead-st.edu:2088/universe/document?_m-b8defeee, Accessed July 3, 2007.

Chipman, K. (2007). *General Motors joins group calling for carbon cap; First carmaker. High fuel standards could hit truck sales*. The Gazette, A division of CanWest MediaWorks Publication Inc. May 9, 2007. Accessed July 3, 2007.
Deutsch, C. H. (2006). Global demand for clean water attracts big and small. *The New York Times Company*. August 10. Accessed July 3, 2007.
Deutsche Presse-Agentur. (2002). Thai Greenpeace urges Dow Chemical to clean up Bhopal Mess. Bangkok, December 2 2002. Accessed July 3, 2007.
Deutsche Presse-Agentur. (2004). Greenpeace demands Dow pay medical bills for Bhopal Victims 2004 December, 2. Accessed July 3, 2007.
Doyle, J. (2004). *Trespass against us Dow Chemical and the toxic century*. Monroe, Maine: Common Courage Press.
Environmental Protection Agency. (2000). Default Order, Docket No. EPSCRA 09-99- 0030, FIRFA-09-99-025. In the Matter of Dow Chemical-Respondent. Region 9, dated August 7, 2000. Accessed July 3, 2007.
Epson, J. (2003, July). Silicon Jack. Freedom Magazines International Incorporated. *Latin Trade*.
Financial Times Information. (2004a). Dow Chemical should take part in the decontamination of Bhopal 2004 global news wire-Europe intelligence wire, Pozitron Information Services, and Access Czech Republic Business Bulletin. November 24, 2004 http://wwws.morehead-st.edu:2088/universe/document?_m=b8defeee. Accessed July 3, 2007.
Financial Times Information. (2004b). Amnesty wants Bhopal studies made public. Global news wire-Asia Africa intelligence wire, Indian Online Media Limited. November 30, http://wwws.morehead-st.edu:2088/universe/document?_m=b8defeee. Accessed July 3, 2007.
Financial Times Information. (2004c). A mushroom cloud of poison. Global News Wire-Asia Africa Intelligence Wire, Indian Online Media Limited. November 30, http://wwws.morehead-st.edu:2088/universe/document?_m=b8defeee. Accessed July 3, 2007.
Financial Times Information. (2006). Eco friendly project aids clean-up of production, 2006. Global News Wire-Asia Africa Intelligence Wire. April 13. Accessed July 3, 2007.
Financial Times Information. (2007a). Global News Wire-Asia African Intelligence Wire. The Indian Express Online Media Limited Source, 1984. Bhopal Survivors Say Ratan Tata is Anti-National. January 3, 2007. Accessed July 3, 2007.
Financial Times Information. (2007b). Global News Wire-Asia Africa Intelligence Wire. Dow Chemicals Kick-Back Issue Rocks Agricultural Ministry. February 16, 2007. Accessed July 3, 2007.
Financial Times Information. (2007c). Dow Chemicals kick-back issue rocks agricultural ministry, 2007b. MP Task Force Ignores Advice on Bhopal Gas Leak Waste Global News Wire-Asia Africa Intelligence Wire. February 16, 2007 Accessed July 3, 2007.
Herrick, T., Newman, M., & Schroeder, M. (2003). US opposes EU effort to test chemicals for health hazards. The Wall Street Journal 9 Sept 2003 Retrieved http://www.mindfully.org. Accessed July 3, 2007.
Kramer, R. C., Michalowski, R. J., & Kauzlarich, D. (2002). The origins and develop of the concept and theory of state-corporate crime. *Crime and Delinquency, 48*(2), 263–282.
Ling, A., & Olson, M. J. (2003). Pesticide action network of North America. Multinational Monitor. The Front, Pesticide Justice. January/February, p. 6.
Mead, N. (2008). Cancer and TCDD: The mitochondrial connection. *Environmental Health Perspectives*, 116:3:A112.
Mokhiber, R., & Weissman, R. (2004, December) The ten worst corporations of 2004. *Multinational Monitor*, 8–21.
Multinational Monitor (2004, November). Interview chemical trespass, the verdict on Dow, an interview with Jack Doyle, 23:11:24–27.
Palmer, M. G. (2007). The care of agent orange. *The Journal of Contemporary Southeast Asia, 29*, 72–195.
Pearce, F., & Tombs, S. (1996). Hegemony, risk and governance: 'Social regulation' and the American Chemical Industry. *Economy and Society, 25*(3), 428–454.
Pearce, F., & Tombs, S. (1998). *Toxic capitalism: Corporate crime and the chemical industry*. Aldershot: Ashgate Dartmouth Publishers.
Sutherland, E. H. (1983) *White collar crime formulating the concept and providing corporate baseline data.* From white collar crime: The Uncut Version (pp. 13–25). Yale University Press.
Transnational Organization Transnationale.org. (2007). Dow Chemical Report http://www.transnationale.org/companies/dow_chemical.php Paid for and accessed July 2, 2007.
United States Security and Exchange Commission Washington DC. (2005). Annual report pursuant to section 13 OR 15(d) OF THE For the fiscal year ended DECEMBER 31, 2005 Commission file number: 1-3433. http://www.dow.com/corporatereport/2005/pdfs/161-00644.pdf (123 pp.).