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Invisible Agencies: Toxic Repercussions of Chernobyl and Bhopal

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Abstract

This article delves into the fluidity of the toxic bodies drawing on Stacy Alaimo's *Bodily Natures* (2010) with reference to the Bhopal industrial leak and the Chernobyl Nuclear Power Plant accident in both of which tons of toxic chemicals and radioactivity leaked, causing extreme abnormalities in people's bodies. Resting on this grim reality, these two events are poignant examples in terms of the embodiment of fluid, toxic bodies of people who are wryly exposed to a massive amount of life-threatening toxicity which has been incorporated underground systems, groundwater lines, springs, and soil. Recognizing how bodies interact with the flow of chemicals and toxicants, this article examines the penetration of environmental toxicity into the bodies of people, explores how fluid the bodies which are, being in constant interaction and contaminated by the substances. I argue that by eroding the boundaries between human and non-human agencies, these eco-catastrophes provide a significant framework in making us realize pervasive toxicity in our lives. To my end, I employ Stacy Alaimo's trans-corporeality to offer a critical framework in understanding the fluidity of the human body which is not distinct and unmalleable but entangled in various rhizomatic webs of connections with the non-human world. Therefore, this article explores how human bodies who are exposed to two catastrophes are toxified through material forces, systems, drains and all underground agents as the boundaries between bodies and environment have become porous and permeable. In doing so, it scrutinizes how our lives, bodies, relationships, politics, and food have become enormously toxic with references to two texts, within the framework of "toxic discourse," Indra Sinha's *Animal's People* (2007) and Svetlana Alexievich's *The Voices of Chernobyl: The Oral History of a Nuclear Disaster* (2006), which dramatize two catastrophes, Bhopal and Chernobyl respectively. The foreboding effects of these two disasters are still profoundly felt and experienced not just locally but globally, which should definitely make us reconsider our taken-for-granted conceptions regarding the more-than-human world.

Keywords: Chernobyl, Bhopal, Stacy Alaimo, Trans-corporeality, *Animal's People* (2007), *The Voices of Chernobyl: The Oral History of a Nuclear Disaster* (2006)

Introduction

Both Indra Sinha's *Animal's People* (2007) and Svetlana Alexievich's *The Voices of Chernobyl: The Oral History of a Nuclear Disaster* (2006), dramatizing two world's greatest eco-disasters, Bhopal and Chernobyl "accidents" respectively, exemplify how bodies interact with the flow of chemicals, radioactive materials, pollutants, and various other xenobiotic substances, and how their agency changes the bodies often in drastic and irredeemable ways. They epitomize the interface with the chemical and radioactive toxicity dispersing over the cities that ontologically become part of the human and non-human flesh. From this premise, Stacy Alaimo's conceptual term, "trans-corporeality", is quite befitting in the scrutiny of the emergence of toxic bodies in both of these narratives as a result of this inseparable interaction with the toxified non-human world. Alaimo defines trans-corporality as "the movement across human bodies and nonhuman nature" (*Bodily Natures* p. 238) in which human agency is intertwined with the social forces and the environment. It "reconfigure[s] the human as a site of emergent material intra-actions inseparable from the very stuff of the rest of the world' (*Bodily Natures* p. 156). After these most destructive accidents, Chernobyl and the Bhopal gas leak tragedy, the emerging toxic bodies and subjectivities, challenge the conception of nature as a resource for human exploitation. By contrast, "nature, the environment and the material world itself signify, act upon, or otherwise affect human bodies, knowledges and practices" (Alaimo, *Bodily Natures* p. 78). It can easily be concurred that as a component of posthuman thought, trans-corporeality recognizes the symbiotic relationship of environments with the bodies and traces the rhizomatic trajectories of toxins across geo-political boundaries. Considering the trans-corporeal connectivity, both Chernobyl and Bhopal are plagued by environmental, toxic degradation that represents the entanglement of global with the local, rich with the poor, past with the future as it recognizes no boundaries of time, place, or concept. Thus, bearing this in mind, within the framework of "toxic discourse", this article explores the emergence of toxic bodies as a result of the toxic trans-corporeal connection of two disastrous accidents, Bhopal and Chernobyl, have engendered. The toxic impact of Bhopal and Chernobyl, particularly on bodies, is exemplified through Indra Sinha's *Animal's People* (2007) and Svetlana Alexievich's *The Voices of Chernobyl: The Oral History of a Nuclear Disaster* (2006), respectively. The analysis of toxic contamination that these eco-disasters have caused mutating bodies irreparably suggests increasing anxieties and concerns towards imminent ecological crisis and environmental deterioration.

Agentic Reminder of Toxicity in Bhopal: Indra Sinha's *Animal's People* (2007):

On the night of December 2, 1984, in Bhopal, India, an industrial Union Carbide pesticide plant factory, as a result of a leak, sprayed forty tons of deadly poisonous gas-cloud methyl isocyanate with other toxic agencies into the sky, spreading over the slum areas, which can be regarded as "the world's worst man-made disaster" (Mukherjee, p. 1). On that frightful night, people woke up from their sleep with a severe burn in their lungs, feeling extreme panic and fear. Due to high levels of exposure to toxic chemicals, a great number of townspeople died immediately without even noticing the chemical drift in the atmosphere. Although the number of people who died after the accidental release of gas has been arguable, Kim Fortun points out that "[r]eliable estimates indicate that 10,000 people died within the first few days" (p. xiiv). However, according to recent estimates, in the subsequent years, the death toll rose to 25,000 with ongoing suffering, pain, and birth deficiencies, as well as many internal, respiratory, growth, and neurological damages and disorders, increasing to 60,000 after-effect cases as people continued to be exposed to this large-scale pervasive toxicity. The toxic methyl isocyanate (MIC) gas poignantly integrated into the main water line and sewers in the city, thus into tap water, resulting in the contamination of drinkable water.

Moreover, the factory and the surrounding area have not yet been completely cleared of toxins and remediated, perpetually putting people under the risk of continual poisoning and contamination. The Union Carbide pesticide factory, "a site of industrial catastrophe" (Horrigan, p. 366), which was later owned by Indian Dow company, was subsequently shut down. The CEO of Union Carbide, Warren Anderson, imputes blame on Indian chiefs and workers for this chemical gas leak. He states, "[o]ur safety standards in the U.S. are identical to those in India […] Same equipment, same design, same everything […] Lines of communication were broken at Bhopal plant. Compliance with these procedures is the responsibility of the plant operators" (Everest, p. 18-19). Union Carbide Company accused the operators and workers of not possessing enough skills and not paying necessary attention to protocols and safety measures, as for them, safety was the responsibility of the operators who worked in the plant even though as Everest observes, "safety systems were not designed to cope with extremes or worst-case scenarios" (p. 34). Refusing their complacency in the occurrence of the disaster, therefore, Union Carbide representatives did not take responsibility for this catastrophe and immediately left the city.

With regards to this, Praful Bidwai avers that "Bhopal isn't only about charred lungs, poisoned kidneys, and deformed fetuses. It's also about corporate crime, multinational skullduggery, injustice, dirty deals, medical malpractice, corruption, callousness and contempt" ("No Way Out"). A related argument is put forward by Pramod K. Nayar, who declares, "[t]he greed, neglect of safety features, carelessness, culpability and deliberate production of potentially lethal toxins" ("The Sunday Edit") combined, resulted in this calamitous disaster. For Suroopa Mukherjee, on the other hand, this cannot be even dubbed as an accident "but the inevitable result of a series of corporate decisions" and "a total systemic failure" (p. 38). Besides, despite the evidence supplied, the representatives of the company repudiated the recognition of present illnesses as the symptoms and wide-reaching effects of that industrial leak. The people of Bhopal have thus been deserted by the American corporate benefactors as well as their own government, who also fail to recognize the horrible effects of this disaster, especially on the poor and disadvantaged people staying at the shanties. In order to evince the severity of the disaster, Kim Fortun lays bare its huge impact explicitly:

> Most of those killed were poor. Many lived in slum colonies adjacent to the Carbide plant, in flimsy houses that offered little protection from the weather-or from airborne toxics. The railway station and surrounding areas were also hard hit […] Meanwhile, people working, waiting, and sleeping on the platform were asphyxiated. The courtyards of Bhopal's hospitals became lined with bodies. Rumors circulated about the dead being dumped in surrounding forests or in the nearby Narmada River. (p. xiv-xv)

As the horrible case was like this, it may not be wrong to agree with Pramod K. Nayar, who declares, "Bhopal is a code-word for all the possible inhumanization that may be inflicted upon a people. The inhuman is not the 'other' of the human but a subset of the humans who have been forced to lose their humanness […] Bhopal is the world's most frightening laboratory where all experiments, with chemicals and with truth, have gone wrong" (*The Sunday Edit*). More than two decades later, the situation sadly has not much improved. The foreboding effects of the Bhopal disaster are still profoundly felt and experienced in the ruined lives of survivors. The toxic trace still lingers in the water, in the land, and in both human and non-human bodies. All in all, today, the groundwater is still virulent, and medical supplies, as well as facilities, do not suffice for the victims of this pesticide chemical disaster to recover. The persistent circulation of toxic chemicals within bodies and the environment continues to this day. Thus, the pernicious repercussions of this disaster are still prevalent, terribly worsening survivors' lives and causing more related health problems, mainly respiratory diseases, and eye problems, and congenital disabilities.

The proximity of slums with thousands of inhabitants, lack of precautious emergency plans, and poor medical conditions exacerbated the disaster. Victims of the Bhopal gas leak tragedy still wait to be compensated and their environment to be cleansed of toxic substances. Although not very much widely known, the industrial catastrophe in Bhopal has shaken many lives, both human and non-human, terribly paving the way for raising voices against injustices, inhumanities, and inequalities that Bhopal survivors have been subjected to. A writer and an activist, Indra Sinha, in *Animal's People* (2007), strives to attract humanity's attention to toxic atrocity still prevailing in Bhopal, which sets as an example of imminent toxic reality engulfing our contemporary lives on a bigger scale. With this, he helps us re-contemplate our increasing kinship with the toxicity that is vital and alive more than ever.

Indra Sinha's *Animal's People* (2007) dramatizes the toxic legacy of this catastrophically destructive Bhopal gas leak tragedy and its calamitous effects with a dramatic story of a post-disaster life in Khafpur, a fictionalized version of Bhopal. Succinctly, it recounts the experiences of a nineteen-year-old orphan boy, nicknamed Animal, whose body gradually is bent over; as a result, he has to walk on his fours. Carrying the burden of toxic residue on his back as evidence of the contaminated past and toxic landscape, he has become a grotesquely deformed figure that epitomizes a relentless reminder of the toxic disaster and the misery of townspeople in the polluted environment of Khafpur. The toxicity has become part of his flesh, turning his body into a toxic body. "Thinking through toxic bodies," as Stacy Alaimo contends, allows us to re-imagine human corporeality and materiality itself, not as a utopian or romantic substance existing prior to the social inscription, but as something that always bears the trace of history, social position, region and uneven distribution of risk" (*Bodily Natures* p. 261).

In this sense, Animal's non-normative posture as the most complex visual and concrete representation of invisible toxicity bears witness to the calamity of the disaster that still pervades the natural environment. His body, in this sense, signifies "vast archive," that bears the toxic history of Khaufpur. Animal mourns this as "[e]veryone on this earth has in their body a share of the Kampani's poisons. But of all the Kampani's victims, we are the youngest. We unborn paid the highest price. Never mind dying, we never even got a fucking shot at life" (Sinha, p. 257). Contaminated by the toxic materials, he endeavors to grapple with the reality that that disaster stripped off his humanity and compelled him to walk on his fours like an animal. As a slow violence effect, it took nine years for his spine to get twisted, and grapple with his "excruciating transformation" (Holoch p. 131), which he vividly explains:

> The pain gripped my neck and forced it down. I had to stare at my feet while a devil rode my back and chafed me with red hot tongs. The burning in the muscles became a fever, when the fevers got bad I was taken to the hospital, they gave me an injection. It did no good. After that my back began to twist. Nothing could be done. It was agony, I couldn't straighten up, I was pressed forward by the pain. Before this I could run and jump like any other kid, now I could not even stand up straight. Further, further forward I was bent. When the smelting in my spine stopped the bones had twisted like a hairpin. ... (Sinha, p. 14-15)

His agonizing recount shows the staggering amount of toxicity that invades his body and piles up over time, turning his body into a posthuman toxic body clearly that designates the vulnerability of the bodies to xenobiotic substances. Pointing to the biological transformation his toxic-inflicted body has undergone, he comes to terms with his own state and denies his humanity, saying, "I no longer want to be human" (Sinha, p. 1). Disowning his humanity, he thus turns out to be a posthuman entity as posthuman entities are "miscegenation of all organisms that are between/inbetween/among humans and non-humans" (Buran p. 157).

Reduced to a deformed being having to walk on his fours, he associates himself more with four-legged creatures rather than human beings.

Besides Animal in the novel, the deadly chemical contamination has deteriorated Ma Franci's psychological stability and caused her to have aphasia. She believes toxic fumes have turned people into either creatures or "prophesying angels," speaking different languages: "On that night all sorts of people lost all kinds of things, lives for sure, families, friends, health, jobs, in some cases their wits. This poor woman, Ma Franci, lost all knowledge of Hindi. She'd gone to sleep knowing it as well as any Khaufpuri, but was woken in the middle of the night by a wind full of poison and prophesying angels" (Sinha, p. 41). The other survivor, who is a musician, has lost his voice, while the mothers have stopped breastfeeding their babies as the poison is passed onto their milk. Such examples from *Animal's People* suggest that fatal toxicity has become an integral part of their lives as their bodies are reciprocally entangled with the circulating chemical, radioactive, or industrial agents in the air. Sinha, by representing fictional chemical leak in the novel, seeks to draw attention to the real event in Bhopal, which is tended to be forgotten.

The Representation of Toxic Bodies in a Toxic Wasteland: Svetlana Alexievich's *The Voices of Chernobyl: The Oral History of a Nuclear Disaster (2006)*

"we did not know the death could be so beautiful."

extract from Svetlana Alexievich's *The Voices of Chernobyl:*

The Oral History of a Nuclear Disaster (2006)

With similar dreadful ramifications, Chernobyl nuclear plant disaster taking place in the early morning hours, on April 26, 1986, as "the second major single exposure to radiation with substantial population" (Baverstock and Williams, p. 1312) after atomic bombs, has engendered widespread radioactive contamination and toxicity on vast geography from some areas of Ukraine, Russia, Belarus to Turkey, and thus shaken the entire world tremendously. The Chernobyl power complex is 130 km north of Kiev, Ukraine, and about 20 km south of the border with Belarus, constructed around the long Pripyat marshes. Due to a violation of certain safety protocols during trials coupled with faulty design, the abrupt increase in heat production occurred and "ruptured part of the fuel, which reacted with water and caused a steam explosion" (Paine, p. 7). A hydrogen explosion, followed by a nuclear explosion of reactor number four, resulted in the deposition of 100 - 250 tons of radioactive substance and dust into the air, as "one hundred times more radiation than the atom bombs dropped over Hiroshima and Nagasaki" (Rigby, p.122).

In the days after the explosion, soviet-Ukraine could not figure out the impact of the disaster and thus failed to alert the public against the real threat until the Swedish government reported to the whole world: "The invisibility of giant doses of radiation was doubled up, covered over, and magnified by the political obfuscation of the disaster, the full scope of which started to emerge only when abnormally elevated readings were detected in Sweden two days after the release of radioactive debris into the atmosphere" (Marder, p.19). "Unperceivable and unannounced" (Marder, p. 19), the extent and magnitude of radiation and its possible effects on both human and non-human life forms was not unfolded immediately, which made "the explosion of the Chornobyl nuclear reactor in 1986 became the first man-made ecological and informational disaster" (Karpushava, p. 260). It took months to evaluate the imminent precarity and impact on humans and the more-than-human world, but the first report released was a sign of ignorance. It says, "toxic limits have been exceeded, but this is not dangerous; one must be

careful about what one eats, but it does not matter if one isn't, all increases in radiation raise the chances of cancer but they are negligible" (Nou, p. 19).

The Soviet Union, unfortunately, took time to respond to the disaster, and by the time the leaders understood the severity of the disaster, so many lives were already broken and lost by the "radiation's deadly invisible force" (Marder, p. 28). First, the firefighters and plant operators were exposed to initial radiation, and many lost their lives. In the aftermath of the disaster, the cloud of radiation from the explosion spread to the northwest by wind currents, leading to the contamination of some parts of Europe, particularly Western Europe and Turkey, which led to an increase in death toll and acute radiation sickness. With the blink of an eye, the radioactive cloud passed over borders, recognizing no walls, territories, or boundaries. As a result of this deadly radioactive fallout, "approximately 4,000 deaths might ultimately result from the drifting radiation" (Jones, p. 93) along with many cancer cases, bodily and neurological diseases, and the long duration of exposure that resulted in many critical health detriments, from lung problems to death of infants, miscarriages and premature births, numerous complications during pregnancy and after birth, and various different genetic consequences. Especially, the enlargement of thyroids became a widespread disease following the nuclear catastrophe. For example, "only 40 per cent of the total release of iodine – 131, a radioactive isotope of iodine that accumulates in the thyroid gland and leads to thyroid tumors and cancers, occurred on the first day" (Ramana, p. 1743). More than 6,000 thyroid cancer cases and a substantial increase in leukemia have been reported. The potency and the magnitude of this nuclear accident affected people can be seen in the following:

> Among the worst affected by the accident were the "liquidators-" those involved in emergency actions on the site during the accident and the subsequent clean-up operations, and who were exposed to high radiation doses. It is estimated that up to about 6,00,000 people were involved in such activities [NEA 2002:13]. Also subjected to significant radiation doses were the over 1,00,000 people, mostly from within a radius of 30 kms around Chernobyl, who were evacuated during the first few weeks following the accident. Finally, about 2,70,000 people continued to live in contaminated areas of the former Soviet Union, with high levels of cesium and requiring protection measures. All three population groups have undergone great suffering in terms of health, social conditions, and economic opportunity. (Ramana p. 1744)

Similar to Bhopal disaster, the controversies around the number of victims exposed to the toxicity still remain unresolved. Irrespective of passing the time, it remains "a symbol of tragedy, a disaster all the more fearsome because of its imperceptible and yet inscrutable effects" and "functions as a cipher for an unmarked trauma" (Marder, p. 43). As Kate Rigby points out, tracing the radioactive fallout and the toxic damage Chernobyl has caused is hard, as, for example, some cancers are likely to take twenty to thirty years to develop, as many as thirty thousand more people might yet die as a consequence" (p. 123). She continues as:

> The fact is, though, that we soon run short of hard facts. Nobody really knows exactly what the long-term consequences of this catastrophe are going to be. Indeed, part of its uncanniness lies precisely in the incalculability of its magnitude. What also makes it particularly disturbing is the imperceptibility of the potentially lethal danger that it has generated. (p. 124)

Because it is "uncontainable in its geographic extent, incalculable in its long-term consequences, indiscernible to human perception, the nuclear contamination that resulted from the Chernobyl disaster" (Rigby p. 124), it can be best explained with what Rob Nixon coins as "slow violence." Rob Nixon defines "slow violence" as an "attempt to give symbolic shape and

plot to formless threats whose fatal repercussions are dispersed across space and time" (p.17). While some disasters have a tremendous instant effect, some like Bhopal and Chernobyl have delayed but formidable slow-acting effects.

From this stance, on account of their long-standing and pervasive ramifications that have transcended generations, Bhopal and Chernobyl disasters both epitomize what Rob Nixon calls "slow violence." As Nixon exemplifies, "stories of toxic buildup, massing greenhouse gases, or desertification may be cataclysmic, but they're scientifically convoluted cataclysms in which casualties are deferred, often for generations" (p. 17). In other words, the catastrophic magnitude of some disasters is unveiled over time and space and therefore has a persistent and wide-ranging impact crossing the local, national, and geographical boundaries and borders. Since toxic pollution disperses among bodies at a slower pace, it is also hard to trace the toxic residues in the bodies until they accumulate to an alarming degree. As Nixon says, this is a violence "that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all (p. 2). "Violence," for Nixon, "is customarily conceived as an event or action that is immediate in time, explosive and spectacular in space, and as erupting into instant sensational visibility" (p. 2). He further claims that because their disastrous repercussions are not instantaneous and visible, the incidents, such as "climate change, the thawing cryosphere, toxic drift, biomagnification, deforestation, the radioactive aftermaths of wars, acidifying oceans" (p. 2) are not generally considered to be violent. After they occur, the illnesses, birth defects, deformities following them develop gradually in time as the staggering effects of the slow violence "encompasses a long and uncertain timeframe" (O'brien, p. 22). Thus, because they have debilitating and accumulated impact affecting a vast scale of geography and temporality with human and non-human species, Bhopal and Chernobyl disasters slow violently continue to violate, damage, and kill.

In order to underline the importance of how invisible chemicals alter our lives, minds, and bodies, Pramod K. Nayar draws our attention to Bhopal campaign that "forces us to acknowledge that the damage has gone beyond what is visible matter. Poisoned blood is a dramatic signifier, but the campaign asks us to pay attention to invisible matter like DNA. By representing the material signs of hidden alterations to the bone, tissue, or molecular structure, these campaigns generate material biographies of victims" (The Sunday Edit). Even though a myriad of radioactive materials and chemical substances are drifted into the atmosphere and thus become no longer visible and traceable in time, their deposits into the soil, land, crops, vegetation, and water bodies persistently and uncontrollably continue and extend over time span incomprehensible to human beings. Still, there is considerable uncertainty about the plausible long-term risks and threats awaiting these two catastrophes. These two catastrophes are pertinent examples that have altered how we understand the nuclear power and chemical poisoning and science and technology that spawned it, and the way we understand our intricate and intimate interrelatedness with our natural surroundings.

By unraveling the fact that Chernobyl has become a toxic wasteland, Svetlana Alexievich's *Voices From Chernobyl: The Oral History of a Nuclear Disaster* (2006) embraces not only personal and political observations and reflections of the survivors and witnesses, but also scientific precision regarding this Chernobyl nuclear disaster. Meticulously recounted from the perspectives of the survivors, the eye-witnesses of the gravity of the disaster, the book constitutes the memories and experiences of the survivors of Chernobyl, blended with their anguish, pain, sorrow, and mourning, and how their bodies turned to be toxic as the legacy of the radioactivity is still in and out their bodies as an agentic force.

The survivors, as they state in their interviews with Svetlana Alexievich, are not just mourning over the loss of their beloved ones but also over the negligence of the government, which spares inadequate attention for the survivors, whom they believe, deserve to be more praised, respected, and remembered. Colonel Yaroshuk, now paralyzed, is one of the soldiers of Chernobyl, who, despite the radioactive risks, did not hesitate to do what was required of him. He, cold-bloodedly,

> walked through the Zone and marked the points of maximum radiation — they exploited him in the fullest sense of the term, like he was a robot. And he understood this, but he went, he walked from the reactor itself and then out through all the sectors around the radius of reactivity. On foot. With a dosimeter in his hand. He'd feel a "spot" and then walk around its borders, so he could put it on his map, accurately. (Alexievich, p. 131)

One of the survivors, asserting that they were "a sacrifice," associates Chernobyl with the catastrophic war and miners as the soldiers who devoted their lives to prevent further poisoning:

> But they [miners] were down there naked, with temperatures reaching fifty degrees Celsius, rolling little cars before them while crouching down on all fours. There were hundreds of roentgen. Now they're dying. But if they hadn't done this? I consider them heroes, not victims, of a war, which supposedly never happened. They call it an accident, a catastrophe. But it was a war. The Chernobyl monuments look like war monuments. (Alexievich, p. 135)

Being referred to as "shiny" due to their radioactive exposition, survivors always felt alienated and separated from the rest of the world. One survivor bitterly states: "I felt we were Chernobylites, that we were already a separate people" (Alexievich, p. 152). The head of the executive committee of the shield of the Chernobyl Association, Sergei Vasilyevich Sobolev, however, ably explains the inevitability of agentic entanglement of the radioactivity that no one is exempt from: "we who were raised in a world without Chernobyl, now live with Chernobyl… At first, it tore the ground from under our feet, and it flung pain at us for real, but now we realize that there won't be another world, and there's nowhere to turn to" (Aleksievic, p. 138). Finally, as Aleksievic attests, the Chernobyl incident dismantled the sociological, economic, and political structure of the Soviet Union, and triggered its collapse; hence, Chernobyl, in that sense, can be viewed as to "start of a new history…A history of catastrophes has begun" (p. 33-34). Because, as also put forward by Michael Marder, "our insatiable desire for energy would consume the entire world, without sparing us either" (p. 27). For that matter, these disasters should set us an example of how trans-corporeal embodiment causes us to become part of their flesh by entanglement.

With all these in mind, one of the leading posthumanist scholars, Stacy Alaimo, referring to the xenobiotic chemicals and radioactive particles that encapsulate our lives as "deviant agents," emphasizes the infeasibility to comprehend the extent of the toxification and poisoning. She states they have "effects – many of which are as yet unknown – on living, fleshy creatures" (*Bodily Natures* p. 138). The pervasive toxicity, however, in time, gradually but poignantly, manifests itself in the imminent physical bodily mutations and mental degradation of people "inhabiting these deviant spaces" (Alaimo, *Bodily Natures* p. 122). By directing our attention to the invisibility of the extent of the magnitude of chemicals and radiation in our lives, Stacy Alaimo also aptly touches upon the importance of recognition of how the material agencies, notably, toxic pollution and contamination, disperse across local boundaries, human bodies, environments, and social and economic systems. From this point, one can easily associate how the survivors of two horrible accidents are invaded by these invisible deviant agencies that re-lentlessly toxify and metamorphose them into toxic bodies.

The extent of the damage they have caused is still unraveling as the toxicity continues to be dispersed over time and various different spaces. Stacy Alaimo uses the term trans-corporeality which "as a mode of posthumanism, occupies the outline of the human, only to dissolve corporeal boundaries by tracing how the substantial interchanges between bodies and places extend into global flows" ("Dispersing" p. 180). Thus, for Alaimo, one of the best ways of critically exploring the embodiment of human bodies with the larger environment and "the material interchanges" between them is trans-corporeality. She also highlights the unpredictability of the amount and impact of toxicity that encapsulates our lives, bodies, and environments. She posits, "the unpredictable material agencies that will unfold as staggering amounts of xenobiotic substances become part of our bodies and environments." (Alaimo, "Dispersing" p. 180). Trans-corporeality showcases "the material interconnections between the human and the more-than-human-world" (*Bodily Natures* p. 2). She defines trans-corporality as "the movement across human bodies and nonhuman nature" (Bodily Natures p. 238) how human agency is entwined with the social forces and environment. This is a posthuman understanding of the human as substantially and perpetually interconnected with the flows of substances and the agencies in the physical environments. These very substances, one can observe, can be both nurturing and beneficial or toxic and fatal. Therefore, the interconnections and interchanges that trans-corporeality demonstrate between various bodies and the places can provide positive outcomes and precarious results.

In a similar proclivity, Nancy Tuana stresses the importance of recognition of swirling uncertainty of accumulated "toxic soup" (p. 198) we are exposed to in our natural environment, which she says it stems from the "viscous porosity" between our bodies and the non-human world. She clarifies this as follows:

> The boundaries between our flesh and the flesh of the world we are of and in is porous. While that porosity is what allows us to flourish –as we breathe in the oxygen we need to survive and metabolize the nutrients out of which our flesh emerges –this porosity often does not discriminate against that which can kill us. We cannot survive without water and food, but their viscous porosity often binds itself to strange and toxic bedfellows. (p. 198)

What scholars Stacy Alaimo and Nancy Tuana, and various others in the field of environmental humanities and posthumanities underscore is the understanding of the trans-corporeal circulation between human bodies and the environments, which does not always lead to positive outcomes. While, as Nancy Tuana points out, the porosity between humans and the non-human environment helps us sustain our living; it may also potentially kill us. Because of this porousness, the toxicity from industrial, chemical, or radioactive agencies toxifies the bodies to a greater extent, the residues of which become hard to trace as it dispenses over a longer time period. From this perspective, Bhopal and Chernobyl disasters serve as a suitable but bitter ground for exploring the interconnectedness and porosity between human bodies and the natural world, as a result of which toxic bodies appear.

The examples of toxic bodies appearing as a result of Bhopal and Chernobyl are best represented in Indra Sinha's *Animal's People* (2007) and Svetlana Alexievich's *Voices From Chernobyl: The Oral History of a Nuclear Disaster* (2006). As Stacy Alaimo argues, "as a particularly vivid example of trans-corporeal scape, toxic bodies insist that environmentalism, human health, and social justice cannot be severed" (*Bodily Natures,* p. 22). Thus, she introduces "toxic bodies" as a site of "trans-corporeal space" (*Bodily Natures,* p. 22) that are permeable and openly intra-acting with the material world freighted with chemicals, substances, toxins, pollution as well as poison. In doing so, she adamantly challenges the cognition that bodies are essentialist and closed entities with well-defined boundaries, representing self; on the contrary, she asserts that bodies are fluid and permeable trans-corporeally interfaced with

"material stuff" of the world. She says: "Civil rights, affirmative action, and identity politics models of science – all of which assume that individuals are bounded, coherent entities – become profoundly altered by the recognition that human bodies, human health, and human rights are interconnected with the material, often toxic, flows of a particular place" (*Bodily Natures*, p. 23). Relatedly, Michael Marder points to the trans-corporeal effect of the Chernobyl disaster, and how the fallout "affected the land and its ecology, the people and their health, political and social institutions, moral and intellectual precepts, culture and agriculture. It sparked off external and internal exposure to radiation, which grazed our skin and which penetrated into us with every breath and every bite from a piece of contaminated food" (p. 44). Thus, both Bhopal and Chernobyl disasters have become significant sites for thinking about the trans-corporeal interaction between bodies and the environment. As a consequence of the gradual built-up toxicity, they both become a toxified place where "both human and non-human bodies are interlaced in the 'trans-corporeal' domino-effect of the toxic event: contaminated are the soil, the vegetation, nonhuman animals, humans, and their future – the future of all living forms involved in this process of genetic toxification" (Iovino, "Toxic Epiphanies" p. 43).

Conclusion

Overall, Bhopal and Chernobyl disasters are just two examples of many that evince how humans have come to mesh with toxic incursion more tightly than ever in the age of Anthropocene. Becoming more entrenched in our lives, marked by techno-scientific risks, waste, commodification, the trans-corporeal dissemination of toxicity as a part of our post-natural and post-industrial society finds itself in toxic food, toxic environment, and communities, toxic minds and bodies, as well as toxic relationships and politics. The escalating environmental toxic threats, the widespread nuclear power plants, high level of exposure to toxicity, chemically and industrially polluted materials, contaminated environment, and their lethal consequences, in particular, have incited, to a certain extent, compelled in a way environmental scholars and writers to produce fiction and non-fiction writings to draw attention to its pervasiveness and the new reality of toxicity in our lives.

Summoning these writings within the framework of what he coins as "toxic discourse," Lawrence Buell, his *Writing for an Endangered World: Literature, Culture, and Environment in the U.S. and Beyond* (2003), defines toxic discourse, a narrative of toxicology, as an "expressed anxiety arising from the perceived threat of environmental hazard due to chemical modification by the human agency" (31). Toxic discourse is suited to exploring how toxic matter is storied within us through the complex display of compromised lives, violated and toxic bodies, polluted minds, and tainted landscapes. This neglected discourse, Lawrence argues, retells narratives of ― rude awakening from simple pastoral to complex, and reminds us to consider the ― facticity and accuracy of the images that are produced in such works (Buell, p. 647-48), which helps us re-contemplate our kinship with the vitality of toxic substances. Rachel Carson's *Silent Spring*, and the subsequent environmental crises of Love Canal, Three Mile Island, Bhopal, and Chernobyl, which remind us of the agentic entanglement of a toxic environment and human bodies, have inspired Lawrence Buell for the immediacy of toxic discourse in the environmental scholarship, as "seldom … is toxicity discussed as a discourse" (Buell, p. 639). For Buell, the toxic consequences of environmental disasters can aptly be addressed in contemporary fiction in order to contribute to a better understanding of environmental degradation and devastated lives and ecologies.

While contributing to raising awareness to the very precarious threats to the natural environment, contemporary writers writing within the framework of toxic discourse, as Ursula Heise notes, use the metaphor of toxic components and toxic laden environment to display how the boundaries between "environment and body, public and domestic space, and harmful and

beneficial technologies" (p. 748) dissolve. As part of toxic discourse, two toxic narratives, Indra Sinha's *Animal's People* (2007) and Svetlana Alexievich's *The Voices of Chernobyl: The Oral History of a Nuclear Disaster* (2006), while the former dramatizes the Bhopal accident and the latter reveals the invisible enemy behind Chernobyl, allow us to recognize how modern, supposedly technological life, is producing toxicity and causing toxic lives. By delineating toxic bodies in an attempt to unravel the incomprehensible effects of disasters, they make us reconsider the toxic flow prevailing in our lives and their lethal consequences. These toxic narratives help us relate to and conceive the natural environment, which has been altered by various material agencies.

In recent years, marked by toxic infringement, it has become crucial to acknowledge matter as a vital and living force that shapes how we know about ourselves and the entire world. This is what new materialists and posthumanist scholars have attempted to do so to pinpoint our very self, and our bodies can no longer be thought disjunct and immutable from the environment that we inhabit. On the contrary, our bodies as "material text[s]" as Serpil Oppermann argues, yields many stories of the particular place with the body is enmeshed:

> Like all material agencies, bodies tell stories: stories of social choices and political decisions, of natural dynamics and cultural practices, and of environmental risks and health issues. The most conspicuous of those stories are those of corporeal porousness and environmental pollution. In this sense, bodies are vast archives of toxic substances and discourses, and political, social, and medical conflicts. ("Alien Agencies" p. 416).

The repercussions of disasters creating toxic bodies have contributed to the emergence of "toxic discourse" which *Animal's People* and *Voices from Chernobyl* is part of. They, as meaningful models of trans-corporeality, offer us an opportunity to help defy the human corporality is separate from the more-than-human world. When "various toxins take up residence within the body," as Alaimo reminds us, "the supposedly inert 'background' of place becomes the active substance of self" (*Bodily Natures* p. 102). These two horrific incidents in two different places yet affecting all humanity show us the material symbiosis between bodies and the wider landscape. They help us developing toxic consciousness towards the environment and make us realize that the invisible yet alive agentic toxicity always remains and lives with us to eternity.

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