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Publications

BOSTON HARBOUR: AN IMAGE OF ECOLOGICAL DISRUPTION IN NEAL STEPHENSON'S ZODIAC

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A healthy environment paves way for a healthy ecosystem. A disruptive environment or society results in disruptive ecosystem. Ecosystem is a chain where the animals and humans depends each other. The article *Ecosystem* explains the definition of ecosystem as "Ecosystems include living organisms, the dead organic matter produced by them, the abiotic environment within which the organisms live and exchange elements (soils, water, atmosphere), and the interaction with these components" (Ellis 1). If disruption occurs at any point of ecosystem, it alters the natural process of whole chain. In the earlier days, Boston Harbour is known for its good ecosystem. The water is pure, aquatic organisms are healthy and it is well-known for its trading and tourism. Later in the middle of twentieth century, the harbour gets completely polluted with heavy loads of pesticides, Polychlorinated Biphenyls (PCBs), heavy metals and contaminating sediments from the industries of Boston. It affects both the aquatic organisms and human beings. The ecological chain gets damaged due to water pollution. It takes many years to bring back the purity of the harbour's ecosystem from pollution. This paper is analysed from the aspect of ecological anthropology. The cultural shift due to new technological development has impact on the nature and its ecosystem. In Boston, the new technological adoption in the industrial sector and its toxic sewage pollutes the harbour heavily. The cultural shift in Boston by adopting modern technologies in industries like new machineries and chemicals spoils the environment. It traces the biography of Neal Stephenson, origin of anthropology, types of anthropology, ecological anthropology and the application of ecological anthropology in *Zodiac*.

Neal Stephenson is the author of speculative and historical fiction. Speculative fiction encompasses imaginative, futuristic and supernatural elements. Historical fiction reconstructs the story that has taken place in the past. Historical fiction can be an imagination or a real incident that has happens in the past. Stephenson has written on the future world and the life of human beings in the world of technology. He has received Hugo and Locus SF Awards, Prometheus Hall of Fame Award and Clarke Award. Mathematics, philosophy, cryptography, linguistics, science and technology are the fields that he has explored in his writings. He has written sixteen novels, short fictions, non-fictions, critical studies and essays. His first novel is *The Big U*. In this novel, Stephenson uses technological weapons like radioactive rats, lab made railguns and hordes of artificial bats. His second novel *Zodiac* (1988) explains the real incident of Boston Harbour's pollution. It explains the degradation of harbour's ecosystem and its effects. This novel narrates the story of Sangamon Taylor, an environmentalist, brings out the conspiracy of industrial pollution in Boston. Taylor gets inspired by Marco Kaltrofen due to his efforts in Boston pollution. Kaltrofen, in reality, is the present President of Boston Chemical Data Corporation. He has undergone environmental investigations regarding toxic, petroleum and radioactive wastes. In the novel, Taylor is a chemist, working under a fictional environmental activism group GEE. He gets involved in the project of Boston harbour's pollution. The Boston industries are the major suppliers of Agent Orange, a hazardous pesticide. His project includes sampling of PCB's concentration in the harbour. Through the evidence, Taylor begins to identify the crimes of industries. As an evidence, he moves one of their ships containing huge toxins quietly and reveals out to the media and public. Through ecological anthropology, disruptive image of the Boston harbour is analysed.

The word 'anthropology' is blending of two Greek words 'anthropos' and 'logos' representing "reason about humans" or 'knowledge about humans'" (Hylland 2). The term anthropology is stated that "the systematic study of human kind" (Scupin 2). Through anthropology, its branches and sub-branches, complete human kind can be analysed. There are different types of anthropology that helps to explore human beings and their relationship with the society, culture, environment, technology, psyche and history. Initially anthropology is sub divided into four types as: biological or physical anthropology, cultural or social anthropology, archaeological anthropology and linguistic anthropology. Cyborg anthropology, media anthropology, data anthropology, software anthropology, computational anthropology and digital anthropology are the upcoming new disciplines of anthropology in the modern digital era. These divisions of anthropology are further subdivided into various types to study the subject in-depth.

The detailed study of cultural anthropology brings way for the interdisciplinary fields like ecological anthropology, economic anthropology, political anthropology, psychological anthropology, medical anthropology, anthropology of religion, anthropology of art, familial anthropology, urban anthropology and legal anthropology. These different sub disciplines help to identify the detailed norms of culture and habits of a particular society.

Ecological anthropology examines the complex relationship among the human beings and environment. The cultural, social and political life of human beings changes or shapes the environment intentionally or unintentionally. In anthropology, ecological perspective is first stated by Steward in 1930 through his concept 'Cultural Ecology'. Kottack explains ecological anthropology as "study of cultural adaptations to environments" (579). It refers to the relationship among the cultural behavior and environment of

the people. The change in culture or social life has both positive and negative impacts on the environment. In this novel, the impact of cultural change alters the nature of environment. Initially people depend upon nature and every object is man-made. After the industrial revolution in the nineteenth century, the human beings started to adapt the machinery products instead of hand-made products. Man power is replaced by the machine power. This change in cultural adaptation reflects upon the environment in which they live. The use of unsafe machineries, the toxic chemicals and their discharge highly pollute nature. The cultural shift in people's life like adapting to the technological world and desire for artificial products leads to forget in preserving the nature. It results in degradation of both human beings and the environment. In *Zodiac*, the aftermath effect of industrialization is depicted clearly. The purity of water is spoiled due to new technological adaptation resulting in various health defects.

The Boston harbour's ecosystem is healthy due to purity of water. When the time rolls, everything is changed; it becomes America's dirtiest harbour. This reputation is depicted as "Boston Harbor earned a widespread reputation as "the dirtiest harbor in the nation" during the 1988 presidential campaign" (Levy 91). The harbour has received this name through the data "collected by the National Oceanic and Atmospheric Administration (NOAA)" It is due to dumping of toxic substances inside the water for a long period. Charles, Mystic and Neponset are the major rivers that lead into the Boston harbour. These rivers are used by the corporate companies "for the disposal of sewage wastes for hundreds of years" (Levy 92). Millions of gallons of unprocessed sewage per day are dumped into the Boston harbour. Stephenson explains this as "Basco and a couple of other companies had rained toxic waste on his native land for years" (Stephenson *Zodiac* 46). The corporate companies try to escape from the government's clutch for polluting the harbour and hiding all their criminal activities from their end. They have taken water resource as a tool to hide all their illegal activities like over use of Polychlorinated Biphenyls (PCBs) and pH level. In an article, the water contamination of Boston harbor is depicted as "Thirty years ago, the harbor was heavily polluted, and costly cleanup activities were motivated by the 1972 Clean Water Act" (Jin 1). The ecology gets affected due to the shift in the mindset of the society. The technological adoption of people in their life affects the nature and its ecosystem.

Changes are inevitable. As there are changes in culture, it reflects towards nature. Adapting new technologies result in cultural change. The utilization of hazardous chemical products in the Boston industrial manufacturing sector affects its environment. Sometimes the reaction of the chemical substance is toxic. In the Journal of Ecological Anthropology the release of toxic chemicals from the industrial sector is depicted as "Although the United States Environmental Protection Agency monitors the 4.1 billion pounds of toxic chemicals that industrial facilities legally released each year, *ten times* that number of chemicals- an estimated 42 billion pounds-or brought daily into our lives" (Grandia 5). Boston harbour is the receiver of all the toxic wastages of corporate companies and sewage. As a result, the aquatic organisms and the ecosystem of the harbor are affected. The lobsters and fish are suffered from tumors and liver problems due increase in the levels of pH and PCBs in water. It is said that:

Two of these problems are significant in Boston Harbor: Beach and shellfish bed closures owing to bacteria; High concentrations of toxic contaminants in fish and sediments... The concentrations of toxic contaminants in fish tissue and sediments are uniformly high in Boston Harbor. The major contaminants of concern are polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs)" (Levy 100, 101).

Taylor and his environmental activism group take steps to prevent the pollution. They sealed the pipes that discharges chemical wastages whose pH level is double than the permitted level.

Once the purity of nature gets spoiled, it automatically starts to affect other living creatures that depend on it. The harbour's water gets contaminated and so the living creatures of harbour's water and human beings also receive its impact. The liver and reproductive system of the fish, lobsters and flounders. According to the researchers in National Oceanic and Atmospheric Administration, "From the icy waters of Boston Harbor to the warm waves of San Diego Bay, bottom dwelling fish suffer liver damage caused by chemical contaminants" (Contaminants 270). A healthy environment paves way for a healthy life. Stephenson explains the condition of Boston as "The environment" was an immense garbage dump to begin with" (Stephenson *Zodiac* 96). Human beings change the nature of water by dumping garbage inside the harbour. As a result, the Boston harbour and its environment are affected to the core. In *Zodiac*, like Rachel Carson's *Silent Spring*, Stephenson brings out the chemical pollution to the limelight and ignited awareness among the people. It is depicted in an article that "In 1962, Rachel Carson made history when she published her seminal book *Silent Spring*, which cataloged the toxic effects of a ubiquitous, but seemingly harmless chemical [dichlorodiphenyltrichloroethane (DDT)]" (Worm 11752). This article explores the effects of plastic pollution in water. The sea birds and other aquatic organisms are at the stage of their extinction due to the plastics in ocean. The pollution is prevented and nature is saved unless human beings take steps to stop pollution. A technological shift occurred during twentieth century results in change in the ecosystem.

Human beings are responsible for the degradation of the environment. The change in cultural and social life of people reflects in the environment. Centuries back, people worship nature as their God. When years passed by people start to demolish nature for their own benefits. In Boston, the industrialists degrade the harbour, resulting in various health defects. This degradation is rejuvenated by building water treatment plants and implementing laws in dumping wastages in sewage. The bond between nature and human beings moves apart due to cultural shift. Changes are inevitable. Though culture changes according to the period, nature is to be protected.

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METaverse: AN EXPLORATION OF VIRTUAL REALITY IN NEAL STEPHENSON'S SNOW CRASH

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Abstract:

This paper explores online addiction and its consequences in Neal Stephenson's *Snow Crash* (1992). He has predicted the concept of Metaverse in this novel. The study reveals the impact of virtual shared platform through the concept 'Digital Addiction' in Cyber psychology. Through this concept the interaction of characters in the virtual world and their real life is analysed psychologically. The physical and mental illness of Da5id, a character in *Snow Crash*, is analysed through Cyber psychology's 'Digital Addiction'. As a science fiction novel, Stephenson has brought out the virtual traps like spreading of viruses and hacking in the plot.

Key Words: Cyber Psychology, Digital Addiction, Metaverse, Avatars.

Technology is intertwined with the life of human beings. The separate concept of human beings and machines gets blended together and it becomes inseparable. Human beings escape from the real world by getting into the world of computers and internet, which are technologically enhanced. A simulated environment, created by using computer technology is known as Virtual Reality, where human beings are the visual creatures. It becomes a major concept in post modernism. Neal Stephenson, an American Novelist, has used the concept of Virtual Reality in his novels. He has coined the term 'Metaverse' in his novel *Snow Crash*. Metaverse represents a collective virtual space, which is full of daemons and user controlled avatars. Daemon, a computer program, is run in the background of Metaverse. Neal Stephenson explains this sub-culture that the people remain in Metaverse with their goggles.

This paper focuses on Metaverse, a virtually shared space in the computer world in Neal Stephenson's *Snow Crash* through the Cyber psychological concept 'Digital Addiction'. Neal Stephenson is known for his speculative fiction. His writings have blended numerous technological and sociological ideas together. His first novel is *The Big U* (1984), which depicts students' satirical life in college. All his writings have some science fiction elements. His third novel *Snow Crash* (1992) portrays the themes like anthropology, cyber space, religion, linguistics, culture, corruption and humanity. Neal Stephenson has predicted the possible cyber future before two decades. The imaginary technological developments in the field of virtual reality and its impact are discussed through the Cyber psychological concept 'Digital Addiction'.

Cyber psychology, also called as 'Digital psychology' or 'Web psychology', is a psychological interaction of people with digital technologies like internet, virtual reality and artificial intelligence. Cyber psychology is defined as "the study of how new communication technologies influence, and are influenced by, human behaviors and subjectivities"(Harley). The digitalized technological enhancement makes mankind to get addicted to it and it becomes difficult to come out of the addiction. 'Digital Addiction' is a concept of cyber psychology. It refers to "an impulse control disorder that involves the obsessive use of digital devices, digital technologies, and digital platforms, i.e. internet, video game, online platforms, mobile devices, digital gadgets, and social network platform" (Singh). People become addicted to certain digital platforms or devices by over using them. It makes them to drop their control in handling the digital platform or device. In the contemporary life, the concept of getting addiction becomes increased. The digital addiction in recent years is described as "almost every activity has been a prey to make it look addictive, which has resulted in new disorders musical activity addiction (or musicorexia), food addiction etc" (Starcevic 919-920). The digital addiction results in certain disorder which can be avoided only if the person comes out of that addiction.

This article attempts to highlight the characters in *Snow Crash*, who are addicted to Metaverse and its consequences. Metaverse is a "collective virtual shared space, created by the convergence of virtually enhanced physical reality and physically persistent virtual space" (Smart). In Neal Stephenson's *Snow Crash*, Metaverse looks like an urban environment which has a hundred meter wide road and a street which runs to 65536 km circumference. The people can access Metaverse with their laptop or system by connecting it to high quality goggles. Monorail is used for transportation within Metaverse. The user can appear as an avatar in any form without restriction. An avatar is merely similar to a cyborg in reality. It is very interesting to learn about avatar. This is explained in an article as:

The term came to popular consciousness with the success of Neal Stephenson's novel *Snow Crash*. Discussions of the nature of the avatar are often mixed with current cyborg theory. Although the avatar and cyborg share numerous social constructions and identity politics, in the interest of developing an understanding of an avatar, it is necessary to distinguish from its cousin, the cyborg. (Morningstar 275)

People find to relax themselves in virtual world by disconnecting from real world. Hiro, the protagonist, enters into the virtual world called Metaverse often. It is depicted as "He's in a computer-generated universe that his computer is drawing on to his goggles and pumping into his earphones" (Stephenson22). Metaverse has everything as in the real world except the laws, government and death. People inside Metaverse are the software pieces in the form of avatars. They can take any form as they want to look like, beautiful or ugly, fat or lean and tall or short.

In Metaverse, Hiro is given a file called Snow Crash but he has not heard the name so far. He assumes that it can be linked with computer virus. He says that "It means a system crash – a bug – at such a fundamental level that it frags the part of the computer that controls the electron beam in the monitor, making it spray wildly across the screen" (Stephenson 39). The same black and white person in the Metaverse has offered Da5id a hyper card. Initially Hiro warns him not to open because it can contain any harmful virus. But Da5id laughed at him and said he has got so much contaminated stuff like this from many hackers. Da5id said working in his system is like "it's like working in a plague ward" (Stephenson 67). Later Hiro is informed that Da5id is admitted in hospital and they put him on a temporary pacemaker. The doctor says "he's got such bad cardiac arrhythmia" (Stephenson 176). Hiro takes Da5id's goggles which are on the floor and looks through it. He identifies that Da5id's computer is affected by Snow Crash and he can see the black and white wall on the monitor.

The digital form of the Snow Crash virus looks like a series of binary information which appears as a bitmap image full of black and white pixels. It is explained that "The virus that ate through Da5id's brain was a string of binary information" (Stephenson 329). The black denotes one and the white denotes zero. Not only Da5id's system software is poisoned by Snow Crash but also his brain. Jaunita explains that "Da5id had a snow crash last night, inside his head ... That digital information was going straight into Da5id's optic nerve" (*Snow Crash* 186). She further explains that when the system gets affected by a virus like Snow Crash, the system flashes with zeros and ones with huge digital information. This digital information enters the brain through the optic nerve so that the person's brain stops working.

The characters in *Snow Crash* escape from reality by getting into the world of Metaverse in the form of avatar. They do not use Metaverse for relaxation but they imagine that it is their world. Mankind becomes prey to online addiction. They considerlingering in virtual world as a necessary one in the digitalized world. Not only Metaverse, but there are so many things in the cyber world that make human beings to get into addiction. It does not merely end in addiction but result in some adverse consequences like mental disorders, health issues and also affects the familial bonding. In this novel, Da5id's optic nerve got affected by using Metaverse. Thus, according to cyber psychology, due to interaction with Metaverse, the life of Da5id gets affected. He started to live in Metaverse more than in the real world. This addiction made him to believe people in Metaverse than in the real life. Through the concept of Digital Addiction, it is explored that Da5id got addicted to Metaverse and his lethargic way of handling it resulted in losing his consciousness. The enhancement in technology is appreciable for its good cause. The over utilization of any technology has its negative side also, which is to be avoided for the betterment of the mankind and environment.

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