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Is Carbon Dioxide Causing Global Warming?

"I wonder, I wonder, wonder, don't you?" Sixto Rodriguez sang in his album, "Cold Fact." This question brings wonder to whether climate has been changing due to human activities or by the course of nature. Michael Crichton's novel, *State of Fear*, enables its readers to see a multitude of perspectives on global warming. This novel possesses thrilling dramas surrounding the controversial topic of global warming that help to shape the reality of its theory. Throughout the novel, many characters hold different views about global warming, some in agreement of human-induced climate change, and others convinced of its falsity. Throughout his novel, Crichton offers a large variety of data and research on the theory of global warming in order to prove the phenomenon to be real by displaying his studies of the correlation between Earth's average temperature and CO2 levels increasing as well as showing the human influence of CO2 production as the Earth struggles to keep up.

Crichton uses the character Peter Evans, a shy lawyer, to develop his case that global warming is merely a theory, not a fact. Early on in the novel, Peter Evans has little to no sources to back up his belief of global warming to be induced by human activity. For example, Evans speaks to Dr. Balder about the definition of global warming, which Evans states as, "the heating

up of the earth from burning fossil fuels," (Crichton 102). However, Evans' belief was rejected by Balder. Balder informs Evans that the definition of global warming is,

> "A *theory that* [increases] levels of carbon dioxide and certain other gases [which] are causing an increase in [the] average temperature of the earth's atmosphere because of the so-called 'greenhouse effect'." (Crichton 102).

Notice that through the character Balder, Crichton emphasizes that global warming is a theory which suggests that there is more research to be conducted before being able to prove the actuality of this theory. Within his novel, Crichton provides a graph that gives insight into the heating of the Earth due to CO2 levels. The graph, titled "Global Temperature 1880-2003" (Crichton 108) shows an increasing correlated relationship between temperature anomaly and CO2 levels. This graph shows that the global temperature has risen by one degree Celsius over the 120-year gap. Furthermore, the graph reveals that carbon dioxide levels in the atmosphere have also increased from 290 PPM to 380 PPM within that same timeline. The evidence provided by this graph undoubtedly proves that carbon dioxide is a factor in the rise of global temperatures. In addition to this, several studies have revealed that humans are responsible for most of the CO2 levels outputted in the last 150 years which further substantiates the claim that global warming is real and majorly contributed to by the actions of humans.

Humans produce carbon dioxide in more ways than one would think. Almost half of the factories in the US burn coal as their main energy source, which creates large amounts of carbon dioxide emissions. For example, Hond, from Energy Information Administration, reported that "complete combustion of 2,000 pounds of this coal will generate about 5,720 pounds of carbon

dioxide." Additionally, a graph from Index Mundi, showcases that coal is being burned at a rate of nearly nine million short tons each year, thus meaning that nearly 100 trillion pounds of carbon dioxide are being generated each year. Coal burning has become a highly normalized practice used by humans as a way to produce cheap energy. However, it is not only factories releasing large quantities of carbon dioxide, but also our everyday activities too. Things like driving cars, taking the bus, and flying on planes generate massive amounts of carbon dioxide. The United States Environmental Protection Agency states, "The transportation sector generates the largest share of greenhouse gas emissions." The amount of carbon dioxide created by people's usage of transportation is absurd and is only increasing as more people are born every day on this planet. Index Mundi suggests that a major increase in CO2 emissions took place between 1980 to 2013. Not only do factories produce excessive amounts of CO2, but humans' natural respiratory cycle does as well. Brian Palmer, a writer for Slate Magazine, reveals in his article 'Are you Hearing the Planet When You Breathe?' that "The average human exhales about 2.3 pounds of carbon dioxide on an average day." Take this number and times it to the 7.5 billion other people on this planet. Every day us humans emit large amounts of carbon dioxide whether it is through producing goods that are made in factories, using transportation, or even simply just breathing.

Carbon dioxide is linked with the greenhouse effect. This is when gases absorb infrared radiation from the sun and re-emit it into the Earth's atmosphere instead of returning it to space. This then causes the earth's surface temperature to warm. Farrar, the author of the book Global

Warming, states, “human activity has significantly increased the number of greenhouse gases—in particular, carbon dioxide.” Unfortunately, the earth is struggling to keep up with our output of CO2 levels as carbon dioxide levels are increasing within the atmosphere. The Earth’s atmosphere is made up of essential gases necessary for the sustainability of life, however, with humans increased usage and production of CO2 and greenhouse gases, Earth’s natural ability to maintain CO2 levels in its atmosphere is slowly becoming hindered. According to NASA, the earth's atmosphere is made up of 78% nitrogen, 21% oxygen, and less than 1% carbon dioxide and other gases. These gases are what keep our earth a constant temperature for plants and humans to thrive. Farrar reports that “greenhouse gases have been essential to the survival of the planet. Without them, the average temperature on Earth would be just 0.4 degrees Fahrenheit.” When CO2 gases get trapped inside the earth’s atmosphere it acts as a thin blanket that provides warmth to our earth. The theory of global warming begs the question of whether this thin blanket surrounding the planet can become a thick fluffy comforter, thus causing the earth to heat to an overwhelming temperature unable to support human life. Climate Research Committee Board on Atmospheric Sciences asserts, “An overload of carbon dioxide is entering our atmosphere at a rate in which it never has done so before.” According to studies conducted by NASA, “Two-thirds of… [global] warming has occurred since 1975, at a rate of roughly 0.15-0.20°C per decade” which furthermore demonstrates the fact that Earth’s temperature is steadily rising due to CO2 emissions.

However, you may be wondering -- does the Earth not have any way of regulating carbon dioxide levels in its atmosphere? Well, the answer to that is yes, it does. The Earth has been known to balance the levels of carbon dioxide emitted into the atmosphere through its carbon

sinks. These sinks are the oceans and forests, places that use the CO2 as a benefit to their own creation. Therefore, the planet naturally keeps its blanket, the atmosphere, at a nearly constant temperature. However, humans have been flushing extensive amounts of carbon dioxide levels into our atmosphere, putting the earth at a disadvantage to maintain proper levels. Earth can be compared to both Mars and Venus to see the effect of varying amounts of CO2 levels in the atmosphere and how it affects global temperature. Mars has a very thin atmosphere, mostly consisting of a small amount of carbon dioxide. Due to this, Mars's average temperature is minus 125 Degrees Celsius. On the other hand, according to NASA, Venus holds, "154,000 times as much carbon dioxide in its atmosphere as earth, and about 19,000 times as much as Mars does." Venus has an extremely high temperature compared to Earth because of its high CO2 levels. These comparisons show a direct relationship in global temperature to CO2 levels.

Today, the theory of global warming is growing to be a fact, rather than a theory as more research has been conducted to prove this claim. What scientists have discovered is a relationship between human development of CO2 and rising temperature of the earth. A graph presented by IPPC fourth assessment report reveals that carbon dioxide levels have doubled, almost tripled since the beginning of the industrial era. The constant increment of carbon dioxide that is entering our atmosphere is unhealthy for earth's inhabitants. Farrar writes, "Never in human history has earth warmed up so quickly before and for such an extended period of time. Greenhouse gas levels are rising at unprecedented rates as well." The theory of global warming is clearly no longer a theory since it is backed up by science. In conclusion, research provided within Michael Crichton's novel, *State of Fear,* as well as other sources prove that global warming is

happening at a faster rate than ever before and that humans' are the main contributor to this increase in temperature. It is important that humans realize that global warming is real and that we are responsible for the worsening state of our planet due to our daily uses and production of CO2 in order for us to work to improve the safety of our future.

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