

## Carbon Dioxide Production and Utilization

### THE CURIOUS CASE OF THE CORN CANNIBAL

**THE SCENE:** A courtroom in Providence, R.I. Doug West, a 46-year-old molecular biologist, is on trial for multiple murders in the first degree.

#### DR. JULIA YANG'S TESTIMONY

I am the head of the molecular biology research team at Hyperion Technologies in Cranston, Rhode Island. Dr. Doug West was one of five applicants who made the first cut for a spot on this team. His CV revealed brilliant graduate work on genetically modified organisms, and his first job was in that field with Gene Frontier Laboratories, an affiliate of the Monsanto Corporation. The CV also revealed a troubling employment gap of five years, from 1998 to 2003. Naturally, I asked him about this time period. He began to fidget, raised his voice and said that he had been “developing his dark gifts.” When I asked him to be more specific, he became extremely agitated, stood up and started pacing around the room and shouting. He told me that he was “an intellectually gifted cannibalistic spirit of the forest.” He referred to himself several times as a “Wendigo” and said that a dark being known as the “the Nameless One” had revealed to him “the forbidden secrets of knowledge.” Although he wasn’t threatening me, I judged that he might become dangerous and pressed the buzzer to call security repeatedly until they arrived. He said that during those five years he had been “following the dictates of the Nameless One to gain great power” and that this made him the best candidate for the job because “he could achieve things that ordinary scientists could only dream of.” At this point, the building security arrived and restrained him while we waited for the police. They took him away and I haven’t seen him until today.

#### DETECTIVE MARK BRONSON'S TESTIMONY

I’m a Detective Second Class with the Rhode Island State Police. The Yawgoo Valley Police called us in because in additional interviews after his arrest, West boasted that in order to get his “extraordinary powers” he had “absorbed some of the best scientific minds in recent history.” Then he said some names: Radhika Gupta, Laura Van Damme and Michael Wozzeck. Those are three scientists who worked at the Gene Frontier Laboratories until they disappeared. Gupta vanished in 1999, Van Damme in 2001 and Wozzeck in 2003. This made us take another look at the cold case file: West was a suspect in the disappearances because in a staff meeting in 1998, he lunged at Dr. Gupta and bit her arm deeply enough to draw blood. Like you might expect, West was dismissed and when Gupta disappeared we thought it might be an act of retaliation for the dismissal, but we found no evidence and had to put the case on ice. His mentioning those names made us think there might’ve been a connection after all and we got a warrant to search West’s home and its grounds.

On July 9th, 2004, myself, Detective Sergeant Romney and Officer Alvarez drove to West’s home, which is near Taunton in the area known as the Bridgewater

Triangle. West lives on two acres backed by the Hockamock Swamp and most of those two acres are planted in corn. I don't know anything about farming, but it looked like regular corn to me. We entered the house and saw no evidence of anything unusual until we reached the kitchen. There were two brand-new refrigerators and every inch of them was crammed with ears of corn and sticks of butter. This seemed pretty weird—I mean it seemed unusual enough to justify further investigation of the cornfield. Those same two officers and I came back the next day along with a backhoe operator. We excavated the cornfield and buried underneath it we found the skeletal remains of three human bodies. Forensic examination and comparison with dental records proves that these were the bodies of Gupta, Van Damme and Wozzeck. Because West kept insisting that he was a “Wendigo” and that we would be sorry when he achieved his full powers, the District Attorney advised that we get a psychological evaluation and called in Dr. Freeman.

#### DR. LOUIS FREEMAN'S TESTIMONY

I'm the consulting psychologist brought in by the State of Rhode Island to evaluate Dr. West's mental state. When we met, Dr. West introduced himself as a “Wendigo”. He informed me that he had researched my career and didn't think I was prestigious enough to be worth “absorbing.” West told me that in 1998, he received a visit from the “Nameless One” who revealed to him his destiny as a superior being and instructed him to “absorb the powers” of others by eating their flesh, which would make him the greatest molecular biologist in the world. This,

he said, was why he bit Dr. Gupta's arm, but he found he didn't like the taste of human flesh. He had worked with corn in the past and concluded that the best way to consume his colleagues would be to allow their dead bodies to fertilize the corn. In decaying, he said, the complex molecules in their bodies would break down and enter the corn stalks as simpler molecules that he could then digest, making their “powers” his own. West appeared calm unless I made any attempt to challenge his version of reality. I concluded that he was suffering from persistent delusions and hallucinations. Let me explain those terms to the jury: a delusion is a fixed false belief that can't be shaken by the presentation of contrary evidence. A hallucination is a sensation that does not come from any verifiable exterior source—the most common example is “hearing voices.” These symptoms strongly suggested to me that Dr. West is the victim of a possibly temporary but probably permanent psychosis—a loss of contact with reality—and thus was not able to distinguish right from wrong at the time he committed these crimes.



### DR. DOUG WEST'S TESTIMONY

I don't know why Dr. Freeman keeps talking about "psychosis." I'm not crazy; I had a vision. The Nameless One told me that I was destined to be the greatest molecular biologist in history, but I couldn't do it alone. I needed the powers that my colleagues had. Sure, it was fine to kill them. They didn't have any destiny. I did just what the detective said. I'm not ashamed of it; I killed them, I buried their bodies in the cornfield, and I ate the corn that grew from their bodies. But you know, it hasn't worked so far. I can't feel myself getting smarter, and I think I know why. I should've done my math more carefully. See, the main thing that plants want from organic material in the soil is nitrogen, and only 3% of the human body is nitrogen. The rest is 65% oxygen, 18% carbon, 10% hydrogen—those are the big ones. If I assume that the intellect of the scientists was distributed equally among all elements and that the corn absorbed all of their nitrogen, I would've had to eat the entire corn stalk, not just the ears, to gain just 3% of their intellect. Maybe there's no shortcut, maybe I would really have had to eat all three of them, but I just couldn't stand the taste of Dr. Gupta's flesh and I couldn't face eating 500 pounds of that. I mean, that would just be nuts. 500 pounds of corn is a totally different story. I just love the stuff! You know, now that I think about it, if I had studied botany instead of molecular biology I wouldn't be in this mess at all.

### Scientific Connection

You might think that this story is implausible, but it pales in comparison to many actual cases involving psychotic individuals. Many people who have committed a crime try to fake a psychosis on the legal grounds that a psychotic person is not responsible for his or her actions, but the aberrant behavior exhibited by psychotic individuals is so extreme that this strategy is rarely successful. Although many people who commit violent crimes are sane enough to know right from wrong, Doug West's hallucinations and delusions suggest that he has indeed lost contact with reality; in addition, his plan would not have worked. He should have stopped listening to evil spirits and picked up a biology textbook.

Dr. West is correct that matter is made of elements that are passed from organism to organism throughout the biosphere. In living systems the most common elements are carbon, hydrogen, oxygen, and nitrogen, with limited amounts of phosphorous and sulfur. This elemental recycling is easily approximated by "The Circle of Life" analogy made in the *Lion King*. When a gazelle eats grass, it absorbs the elements the grass is made of and incorporates some of those elements into its own molecules. The same thing happens when a lion eats the gazelle. After the lion dies, decay will break its complex molecules into simpler ones that are absorbed by and incorporated into plants, scavengers, and bacteria. When another gazelle eats those plants, the cycle continues.

This constant recycling of matter throughout the ecosystem has given rise to "matter cycles" like the carbon, nitrogen, and water cycles. The elements in your body have been recycled over and over through again for trillions of years. Some of your carbon could have at one time been in the bodies of dinosaurs, saints, philosophers, and kings.

Dr. West is also correct that not all of the scientists' molecules would have entered the corn and then his own body. Unlike herbivores and carnivores, which consume organic material (meat or plants) to obtain carbon for the synthesis of complex molecules, plants obtain the carbon they need from the carbon dioxide gas in the atmosphere, which is the product of cellular respiration in animal and bacterial cells. This carbon dioxide gas is captured or "fixed" by plant cells to be used in photosynthesis, which in turn produces the oxygen essential to cellular respiration. Simply put, this means that these two principles oppose one another in their actions and complement each other's effects. Because plants get their carbon from the air, they would not absorb the carbon in the bodies of the murdered scientists. Plants do absorb nitrogen from the soil (many artificial fertilizers contain high percentages of nitrogen), but nitrogen composes only 3% of the human body—making this system of indirect cannibalism extremely inefficient. In addition, intellect and ability are not chemicals and aren't passed on through the carbon, oxygen or nitrogen cycles; if they were, you would only be as smart as the cows or carrots you consume. So if you were thinking of eating the kid next to you in order to do better on your next test, forget about it.

↪ **Take Home Message** ◀

**Matter can be neither created nor destroyed and is constantly recycled throughout the biosphere.**