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Hi! My name is Rachel Garnett and I am a sophomore at the University of Lynchburg. I am double majoring in Biology and Chemistry, and hope to either become a sustainable engineer, or work in the realm of science communication. I love nature and I love to write. I am thankful for this opportunity to combine two of my interests. I decided this year to focus on my love for trees, which I find fascinating and equally valuable. I hope that my work one day will express how important it is to take care of our planet, both for ourselves, organisms, and future populations.

Roots

She stands proud and upright, delicate.

The birch sways and curves towards her peak in the sky, her large pores directing the eyes upward to rest on alternating light-green leaves. Birch bark envelopes the cambium in thin, pleated sheets, and produces a scent comparable to that of mint.

The pine anchors itself with thick roots, and rises stock-straight, its dark green needles puncturing the surrounding air with countless pinpricks. Terpenes and their corresponding subunits, monoterpenes, exude the pine's fragrant aromatic scent reminiscent of rosemary, clouding the tree and its surrounding landscape in a hazy mist of invigorating spice. The head of a Virginian whitetail deer peeks around its wide trunk, blinking black eyes ringed with white.

African Padauk, *Pterocarpus soyauxii*, indigenous to tropical regions in Africa, provides an aroma almost sickly sweet, like cinnamon sugar. Its red-orange base is delineated with dark mocha stripes, as the wood patiently develops to reveal a deep crimson when exposed to heat. African Padauk foliage can range from shades of kelly green to mint, revealing a flash of bright yellow lime when illuminated with sunlight.

Cherry has perhaps the most impressive transformation of all, darkening in color over the years, its tan and pink base deepening to a deep dark red. Cherry wood trees possess a thick, scalloped bark with trunk bases that vary in diameter - from thin, but solid trees that mingle and twist to cherry trees that dominate and exploit their neighbors, occupying as much of the landscape and canopy as possible when provided with the appropriate conditions.

As summer temperatures dissipate, the Black Walnut's pinnately-compound leaves ebb in chlorophyll, leaving behind a striking display of orange and yellow foliage that contrasts against the rich-brown bark of the walnut. The walnut tree in my backyard extends over the neighbor's fence, envious of an adjacent red oak, the *Quercus rubra*, with leaves the color of an Ambrosia apple and a thick, sturdy base that extends upwards of one hundred feet. The red oak is a majestic specimen; leaves are clear, sharp rubies that shimmer and reflect pink light onto my driveway.

The South American Tarara Canarywood produces an irregular wavy grain, light-yellow, flecked with golden lines. It's aroma is pungent and earthy. When flatsawn, the grain of the canarywood resembles that of a sunrise, displaying differentiated growth rings of pink and orange that emanate from the pith to the structural inner bark. Her branches extend outward into space, proudly flaunting a collection of foliage to the world. Leaves which, once battered with wind and rain, gently surrender and swirl downwards to happen upon land in a soft and quiet finale.

Few in nature hide secrets as well as the tree, who speak their truth in spite of our ignorance. Beneath the impassive exterior of bark, rough or smooth, a canvas blank or decorated with spots and scars, trees communicate, exuding chemical signals and scents relative to their surroundings. The trees twitter at our ignorance, communicating through one another's root systems to send messages back and forth - right in front of our eyes and under our noses. We see and recognize their beauty, their aesthetic appeal. Yet, we pillage their environments, slashing, burning, and chopping till we have reached our fill. We exploit their utility as giving trees,

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recognized as endless providers who ask for nothing in return. Nature, selfless and beautiful, powerful and proud, is taken advantage of.

Accumulation of carbon dioxide in the atmosphere disrupts delicate photosynthetic processes, and limits the total production of oxygen produced by a photosynthetic organism. The giving tree has exhausted her resources, and is finally relieved of duty: cut, slashed, and distributed. Yet another carbon sink removed from the equation as industrial production threatens to overthrow the delicate life-sustaining processes present in nature. If we are not careful, the decade of 2020 will be one defined by ecological and humanitarian crises. The continued use of fossil fuels and its subsequent production of carbon dioxide is slowly destroying the planet, and this environmental neglect extends into all sectors of life. Thankfully, we can reverse these processes to a certain extent, but it is imperative we begin quickly. The current indicators of climate change, as well as projections of its possibilities, show that the warming of our planet precedes a wreaking of havoc around the world, with little action being taken by global summits and developed countries - those players actually capable of reversing the damage that has left us in such dangerous territory.

The challenges our global world faces pertaining to the health of our natural environment and its inhabitants possess no geophysical or national boundaries. The quest for clean air and water is an entirely human enterprise, and must be recognized as both a political and environmental necessity. I believe that our natural world has intrinsic value, and our natural resources and wildlife must be preserved in order to provide a sustainable future for subsequent generations. Fossil fuel production and industrialization, if not abating, need to be met with regulations safe for both future generations and the natural world we have the duty to protect and

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admire. Technological innovations may be the deterrent this planet requires, but regulations still need to be in place, in favor of cleaner energy sources. Natural resources deserve our protection.

The increasing influence of carbon dioxide on our environment has contributed to an increasingly warmer planet, impacting every single living organism on this earth, not sparing those of the human race. Consequences such as raging wildfires, rising sea levels, and tsunamis are foreseeable disasters predicted to occur within the next twenty years if we are unable to counteract our reckless use of natural resources with clean and efficient energy sources. To underestimate the value of our natural resources, such as trees, is unethical. The roots of our history are cemented in the natural world; it is time we acknowledge her worth.