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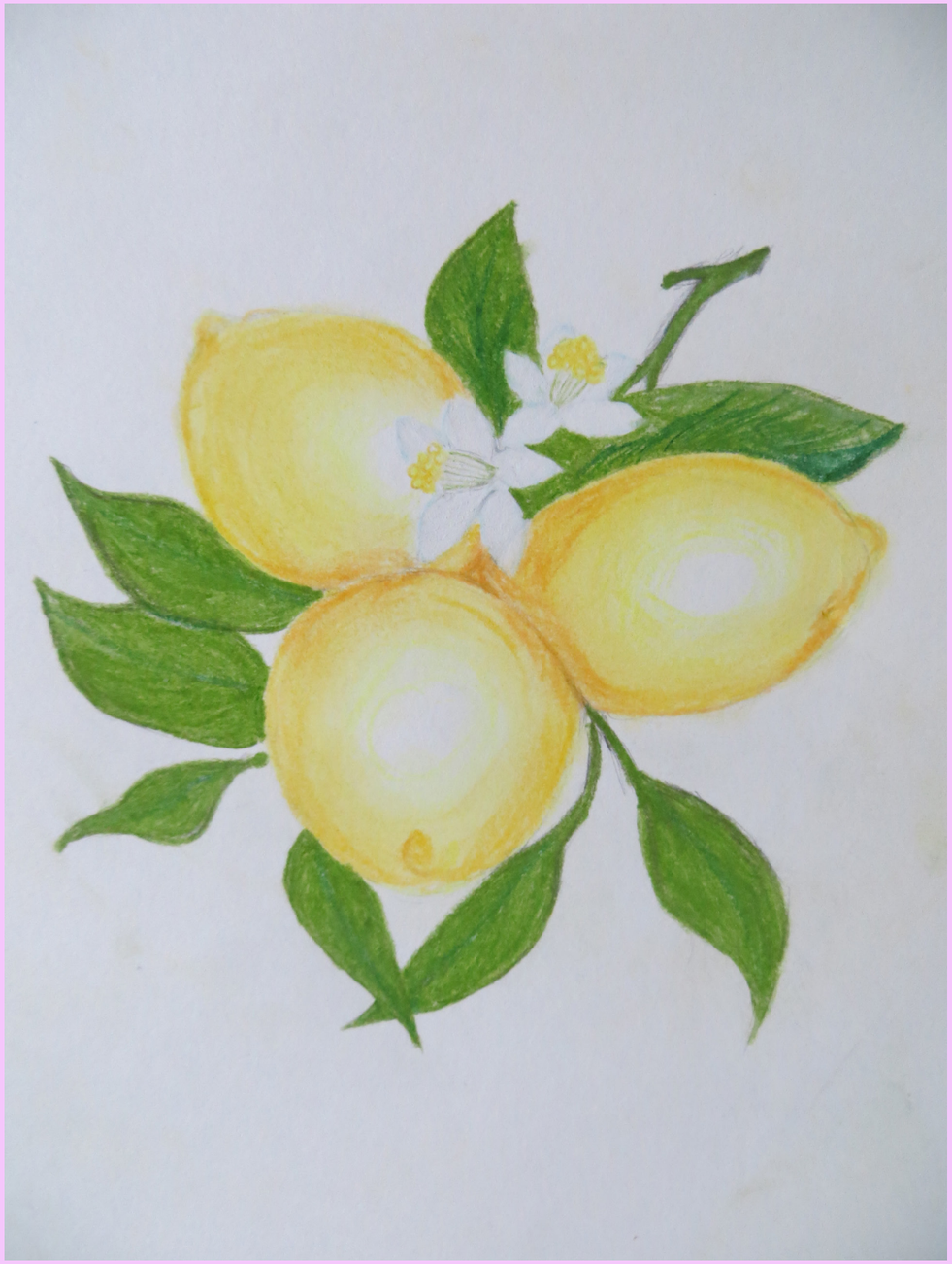
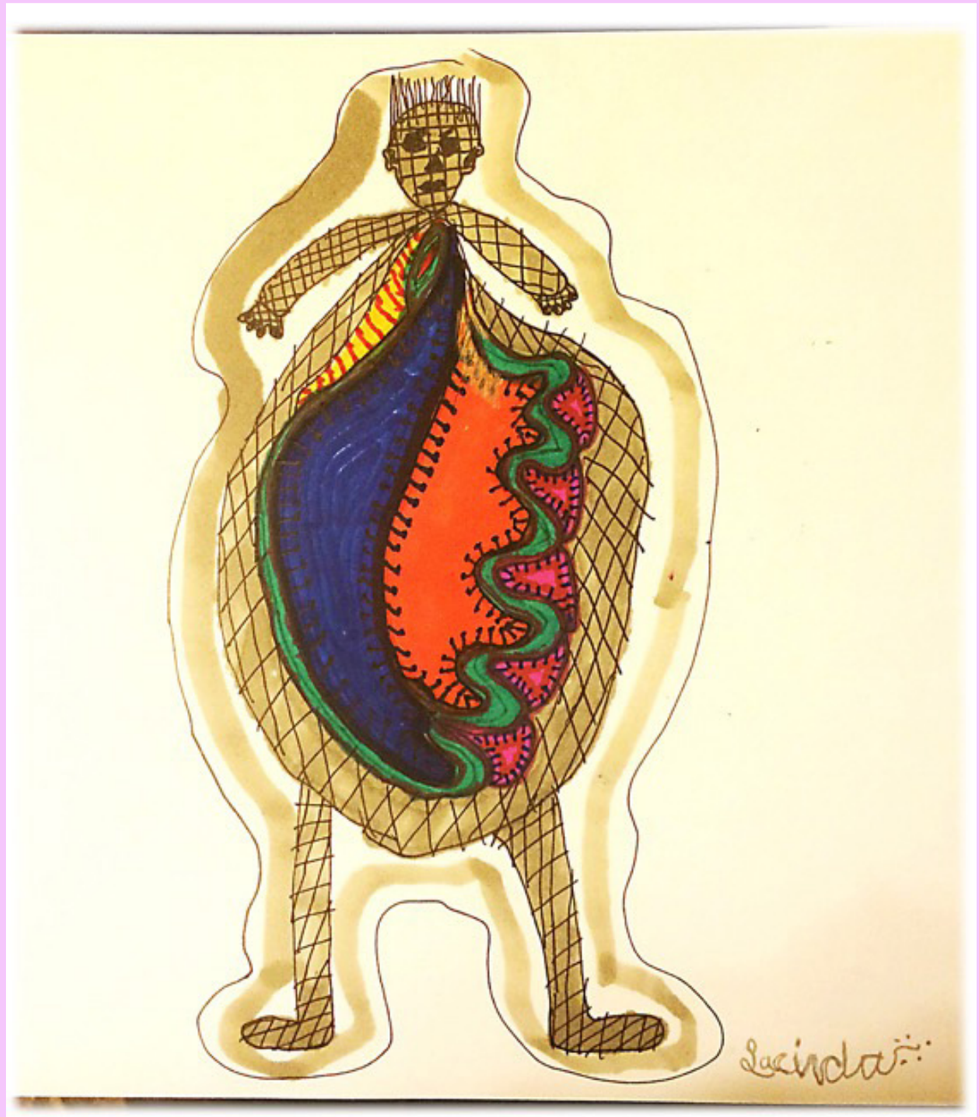
Art

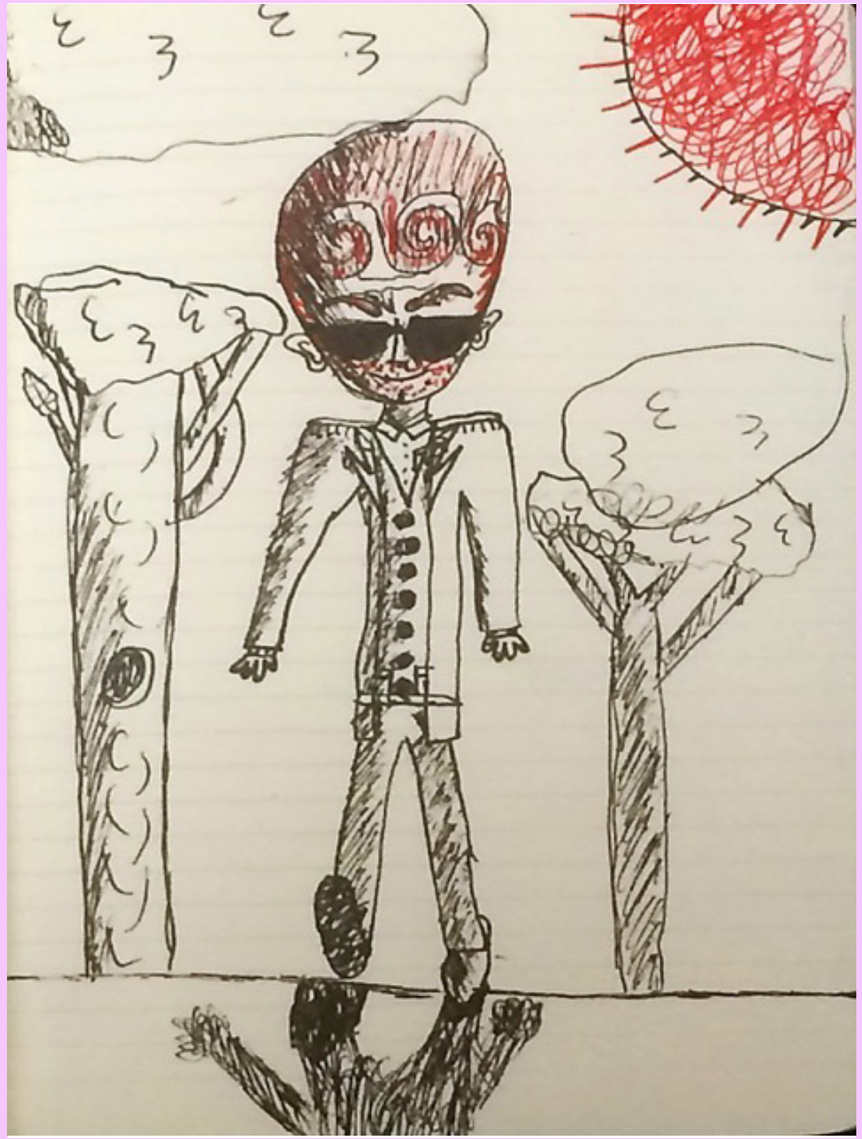
Isabella Kiedrowski



Isabella Kiedrowski is 13 years old and has been drawing ever since she could hold a pencil. She enjoys music which includes playing the harp, the piano, and singing. An ideal day for her would involve drawing, music, no mathematics whatsoever, and one of her chickens laying an egg.

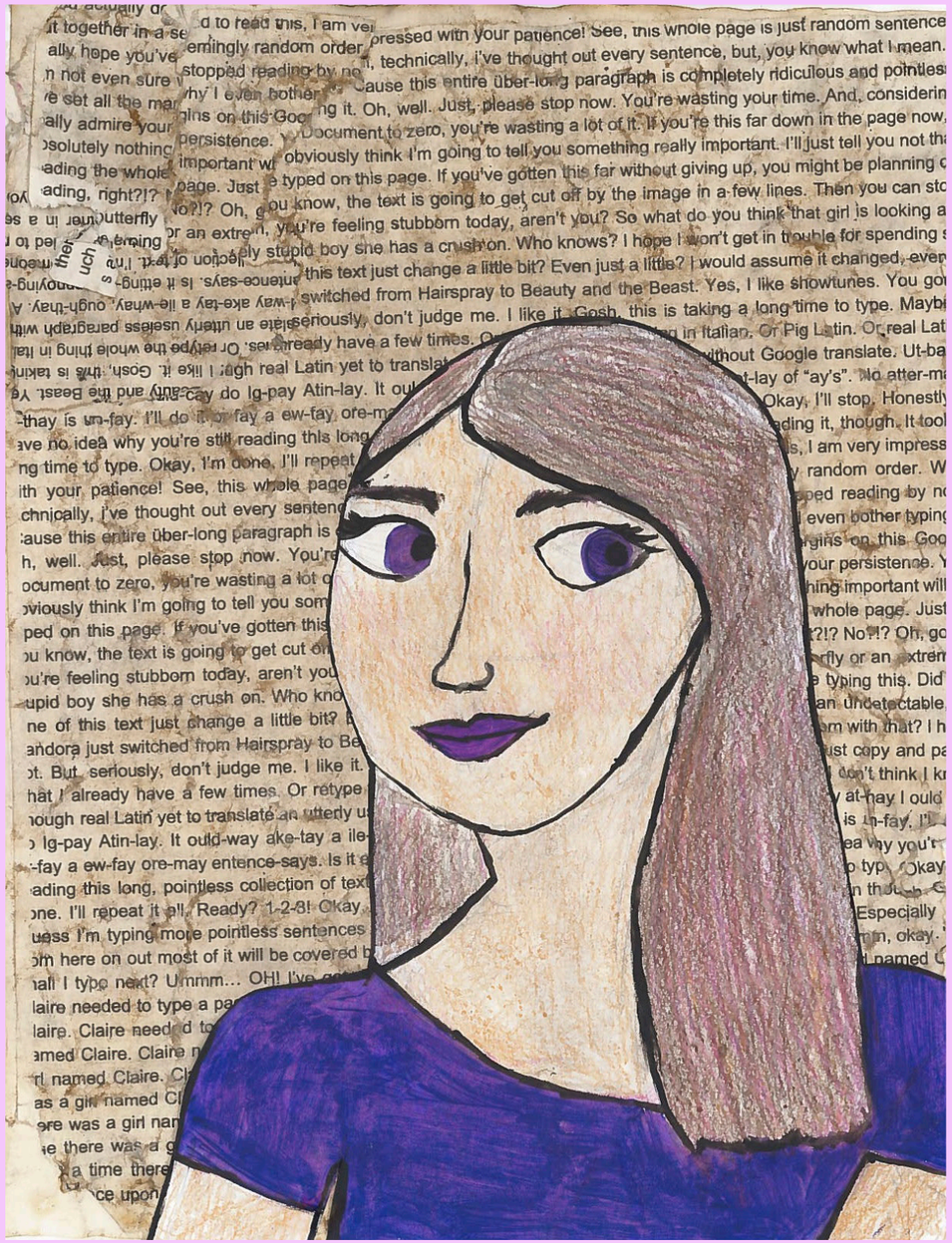
Lucinda Lodder Lindstrom





My name is Lucinda. I am 8 years old. I have been drawing all my life, and have always liked the way a pen makes a picture on the paper. I have started to like noticing the little details in real life and including them in my pictures. I also enjoy making origami. I have a cat named Aslan and a turtle named Myrtle. I would rather be set on fire than wear a dress.

Claire Goodman



Humanities

Elizabeth Medina

As a young child, I have always wondered why male primates have nipples. It turns out that male nipples are vestigial organs, left behind in the process of evolution. Male nipples are one of several pieces of evidence for the theory of evolution. The other two are the fossil record and rapid evolution in isolated populations, such as the Galapagos finches. It is interesting to compare the scientific evidence for evolution with the evidence for intelligent design.

A scientific theory is an explanation of a pattern of facts about the natural world. Facts are things or events in the world than can be repeatedly observed and are generally accepted as true. A scientific theory is supported by evidence and makes predictions that can be tested and confirmed or rejected through observation and experiments. The theory of evolution is a scientific theory and the theory of intelligent design may or may not be. This essay introduces evolution and presents evidence for and against human evolution. It then introduces intelligent design and presents evidence for and against that theory. It concludes by providing an opinion on both theories.
The theory of evolution is basically that "living species are the descendants of ancestral species that were different from present day ones." (Campbell, G-10) All organisms on earth are related through this process of descent with modification. The primary mechanism for this process is natural selection. Natural selection drives the variety of organisms because the natural world has limited resources, so organisms with certain inherited characteristics are more likely to survive and reproduce than competitors who lack such characteristics. The theory of human evolution states that evolution alone created human kind.

A scientific theory is strong if it is supported by several independent lines of evidence rather than just one. Three such lines of evidence for the theory of evolution come from the fossil record (paleontology), vestigial organs (morphology), and observation and lab experiments testing the process itself in organisms.
The fossil record is the chronicle of evolution through time as fossils appear in the rock. Geology says that later layers of sedimentary rock occur on top of earlier layers. Evolution predicts that similar species will occur together in the same or nearby layers. It also predicts that later species and descendants will occur later than – on top of – the earlier sedimentary layers. These predictions are confirmed by the evidence. Similar species are always found in the same or nearby layers and descendants are always found in later rock layers than their ancestors. (Quammen)

Vestigial organs are structures that have no current importance in an organism. They are remnants of structures that did have important functions in that organism's ancestors. Darwin said that "Vestigial structures stand as remnants of the evolutionary history of a lineage." (Quammen) Evolution predicts that since organisms share common descent, they will share common structures – like limbs, skeletal structures, and organs – that are shaped by natural selection but remain as evidence of their history. And in fact many confirming examples have been found in nature, such as the tiny legs and pelvis in some snakes, the tail bone in primates, the wings in flightless beetles, and the five-digit skeletal structure of the "hand" of porpoises. (Quammen)

Although evolution is supposed to happen slowly there is some observational and experimental evidence of it working. Peter and Rosemary Grant claimed to have observed it in their studies of changing beak size in the Galapagos finches after a natural disaster on the island changed the island's environment. William Rice and George Salt claimed to have seen it in fruit flies with their experiments involving mutations on a single gene that changed wing morphology. Lenski and his colleagues claim to have observed the process over thousands of generations in E. coli. (Quammen)

The primary objections to evolution and natural selection that don't come from the intelligent design community accept these theories as generally true. The disputes are over aspects of the theories. One of the main general objections to evolutionary explanations of the origins of characteristics and species comes from Stephen Jay Gould and Richard Lewontin. The objection is that biologists too often tell evolutionary "just so stories" about the origin and function of characteristics and the development of species. These explanations are not rigorous or testable. Another objection to natural selection is that there are many other biological processes responsible for the features of organisms that Darwin did not know about, such as "gene transfer, symbiosis, chromosomal rearrangement, and the action of regulatory genes." (Scott) It is likely that all of these mechanisms shape organisms in addition to natural selection. Even physics and geometry play a role: the hexagonal shape of honeycombs is likely due to the physics and geometry of those structures (as with soap bubbles) rather than natural selection shaping how bees design them.

Intelligent design is the theory that an intelligent agent created the universe. According to intelligent design, evolution alone cannot explain how life is so complex, and how human kind is different from the other primates. There are several arguments for intelligent design but they all are negative in nature. They say that since evolution cannot explain X, an intelligent designer must be posited. The three arguments discussed below differ in what they say "X" is. In the first, X is the general improbability of life. In the second, X is the "irreducible complexity" in nature. In the third, X is all the features of living things.

The first argument is that life needs a designer because life itself and the necessary conditions for it are wildly improbable – maybe impossible -- without design. The second law of thermodynamics is often used to support it. This law of physics states that "every energy conversion reduces the order of the universe, increasing its entropy." This means that the universe is slowly getting messier, losing complexity and order. But since evolutionary processes require an increase in complexity and order, they violate the second law. The problem with this argument is that the second law applies only to closed systems rather than open systems. The universe as a whole is a closed system and is losing order and complexity. But organisms and the earth are open systems. They take in energy from outside of themselves (animals eat and the earth gets sunlight) and so can increase order and complexity.
The second argument is Behe's argument from "irreducible complexity". Darwin himself recognized that if one could find a complex organ that could not be created by "numerous, successive, slight modifications," his theory would be refuted. Behe gives several examples of such "irreducible complexity", such as mousetraps, the bacteria flagella, and the proteins that clot blood. Such irreducibly complex systems cannot be built by modifying prior systems "because any precursor that was missing a crucial part could not function." And since natural selection can only work with systems that are already working, these irreducibly complex systems cannot come from natural selection.

The problem with this argument is that parts and assemblies of parts can have useful functions before they combine into a final assembly. Pieces of a mousetrap can be used for many things. A group of proteins from the flagellum is used by some bacteria to inject poisons into cells. And proteins used to clot blood are modified versions of proteins used in the digestive system.

The third argument says that natural selection and evolution cannot account for all features of living things. Jonathan Wells makes this argument. He argues that the best examples of observational and experimental evidence for natural selection and evolution demonstrate only minor changes and not the big changes in species needed by the theory of evolution. Similarly, when geneticists in the 1970s discovered that mutations in a single gene could modify fruit fly wings to produce an extra pair of wings, they actually only discovered duplication of existing structures, not anatomical structures that create new species.

There are two problems with this line of argument. The first was outlined above: biologists who accept the theory of evolution and natural selection don't believe evolution and natural selection are the only causes of all features of organisms. They recognize many factors outside of evolution or natural selection – like one-time events such as comets or the effect of physics and geometry in honeycombs. But evolution and natural selection are a primary cause. The fact that there are causes of biological features beyond natural selection does not support intelligent design.

The second problem with the argument is that it looks at particular examples of research and then claims that they do not show dramatic evolutionary change. The finches didn't become a new species and the new sets of fruit fly wings aren't better than the old ones. But the research shows how evolutionary processes work – with more time and genetic mutations. It shows the actual processes and genetic mechanisms that drive species change along with other mechanisms.

In my opinion the theory of evolution makes clearer predictions and explanations, and is better supported by the evidence. There is a vast range of evidence – ranging from how fossils are layered in rock to why snakes have tiny legs to why the human and chimp genomes differ by only 3.9% -- that is explained by the theory of evolution. The evidence for intelligent design, on the other hand, is unvaried ("evolution can't explain X"), and focuses on demolishing the theory of evolution. The believability of intelligent design relies overwhelmingly in a belief in a God or other intelligent designer – while ironically evolution is also compatible with a belief in God, though perhaps one who doesn't tinker once the machine is in motion.

Elizabeth Medina is 13 years old. She lives in Palatine with her two brothers, her parents, her dog, Bella, and her cockatiel, Bowser. She plays violin in the Elgin Youth Symphony Orchestra. She enjoys horse-back riding, reading and playing with her pets.

Fiona S. K. Repp

Most wild tiger populations live in Asia, specifically throughout Southeast Asia, China, Korea, and Russia, and they prefer to be in swamps, grasslands, and rainforests. Unlike other cats, tigers love the water and are very sensitive to heat. Most tigers will go soak in water after a kill. Tigers usually eat grass, deer, buffalo, wild cattle and boars, and occasionally fish and crabs. Tigers are either diurnal or nocturnal, depending on which species of tiger is in question. They are usually solitary animals, only seeking other tigers during mating season. Tiger cubs leave their mothers after only two or three years. Challenges tigers face day to day are largely human-related. They are the apex predator in their natural habitat, challenged only by us. Their problems are mainly along the lines of humans invading their territory and destroying their habitat.

We've all heard stories or seen YouTube videos of people owning predatory cats as pets. Or seen a roadside petting zoo advertising an up-close-and-personal experience with a baby lion or tiger. But what happens to those cats when they become adults? Can they be released into the wild? Or are they destined to a cage in a basement somewhere for the rest of their lives? The goal of this paper is to educate you, the reader, on just what happens to big cats in captivity.

According to the World Wildlife Foundation (WWF) there are more tigers in captivity in the United States than free in the wild. While this may seem like there are lots of tigers in safe havens, this is not the case. For example, in October 2011, Terry Thompson of Muskingum County Animal Farm opened the cages containing various dangerous animals including tigers into the local community of Zanesville, Ohio, after which he committed suicide. First responders were forced to shoot more than 10 captive tigers, along with other animals. On the first anniversary of this tragedy in 2012, WWF was among several other conservation and welfare organizations in submitting a joint petition to the United States Department of Agriculture (USDA) asking for a ban on public contact with tiger cubs, because the babies are desirable for petting zoos but the adults are not. The cubs are more desirable as pets and attractions because during the first year after birth they're largely helpless, but when they get a bit older they grow big enough to start hurting people. The cubs are also cruelly removed from the care of their mother too early. Any adults that are kept as pets are often maimed, with their teeth and claws removed. In many jurisdictions, people can legally keep a tiger on their property without reporting it to local officials or neighbors. In some states, it's easier to buy a tiger than adopt a dog from a local animal shelter. The lack of regulation of captive tigers is a major threat to public safety. Lax oversight means tigers can be held in areas that may not be adequately secured. Officials are rarely able to determine how many tigers there are in captivity within state borders, or where they are, who owns them, or what happens to their body parts (highly prized on black markets and Asian markets) when they die. When tiger ownership and breeding aren't monitored, captive tigers become easy targets for black market sales, and those sales end up threatening wild populations, too. The illegal trade in products derived from captive tigers stimulates demand, especially for tigers in the wild. The greater the demand, the more wild tigers will be poached.

Tiger Ridge is an example of a small petting zoo that didn't take care of their animals. The Perrysburg, Ohio zoo's downfall came when a scheduled city inspection in January 2015 revealed that the owner Kenny Hetrick hadn't completed any legal paperwork (licenses to own exotic animals, monthly upkeep reports, etc.) since the zoo's establishment in 1975. The zoo also failed to comply with fencing regulations. Thus they were closed down and the animals were removed from the zoo's custody.
WWF and Trade Records Analysis of Flora and Fauna in Commerce (TRAFFIC) were among the first to raise the alarm on the lack of captive tiger regulations in 2008. Since then they have called for a ban on private possession of big cats like tigers and lions and asked for those who currently own big cats be required to register these animals.

In October 2003, there was a tiger attack on stage in Siegfried Fischbacher and Roy Horn's Las Vegas magic act, Siegfried & Roy at the Mirage Resort and Casino. They were known for appearing with white tigers and white lions on stage. Natural white tigers do not survive in the wild; all white cats that appear on stage possess a gene mutation common in Bengal tigers. This gene mutation is sometimes called leucism. Any white Siberian tigers are the result from captive breeding with Bengal tigers. The gene for white tigers is so rare that only one of four cubs is born white, and eighty percent of those die of birth defects. A white tiger cub sells for about $60,000. And what happens to the unwanted tawny tigers that are born? Usually they are killed for their parts (which are then sold to Asian medicine markets), or sold to an independent, unregulated petting zoo. This kind of show and similar attractions usually showcase tigers that have been inbred, or will be sold off to canned hunts once the show they are in stops making money. As for lots of small-business petting zoos, they mistreat their animals regularly, putting them in too-small cages, failing to feed them properly or cater to their mental and emotional needs, and subjecting them to constant contact with tourists and domesticated pets, which could lead to disease for the cats.
So it seems captive tigers pose a threat to wild tigers and public safety, and are mistreated regularly. But what about the pre-existing tigers that have been abused by exotic pet hoarders and can't be released into the wild? What will happen to them if tigers in captivity are banned?

One nonprofit organization that takes in wild cats that have been abused in some way is InSync Exotics, stationed in Wylie, Texas and founded as a nonprofit organization in 2000. They drive all around the country, picking up animals that local and federal officials are have asked them to re-house, animals that were bought by unthinking parents getting a "cool" pet for their child, babies that have been bought by poorly maintained roadside petting zoos, or put in any number of unintentionally or intentionally abusive situations. They give these animals a place to live with adequate space, toys, food, friends, and medical care for the rest of their lives. They also provide all the tigers with swimming pools. InSync also provides education to the public about why not to buy an exotic pet, buy black market tiger products, or go to petting zoos offering tourists an opportunity to pet a wild cat. InSync also contributed to vaccine research after suffering an outbreak of a strain of canine distemper, which killed a number of their big cats. Canine distemper is spread by other species like wild raccoons, but the main sources are unvaccinated domestic animals.

However, places like InSync and Tiger Ridge aren't really conservation. InSync is technically one woman's (Vicky

Keahey) private collection, and Tiger Ridge was a family business. They're legally required to sterilize their animals, meaning they can no longer help contribute to the wild gene pool.

As for other organizations that keep tigers in captivity, there are reputable zoos worldwide (like San Diego Zoo) that keep tigers. Most of them, like InSync, are there for public education about wild animals and why they're important to conserve. Though not all zoos, even well known zoos, are ethically caring for the animals they possess. Most provide little to no mental stimulus or insufficient enclosure space, and it shows when their animals endlessly pace or show other unnatural repetitive behaviors. Ethical zoos manage not just a diverse reservoir of individuals for their genes but fully promote the mental and physical health of their specimens.
These ethically managed conservation and rescue organizations help deal with the problem of big cats' shrinking habitat in the wild. They provide a reasonably safe and interesting life for cats that would otherwise be killed by villagers or logging operations, or captured by hoarders and poachers. They also keep a genetically diverse population on hand in case an animal's population would need to be replenished due to a natural or manmade disaster.

In summary, the private ownership of big cats appears to lack regulation, and regularly feeds into black markets and Asian medicine markets, which creates a market for breeders and a burden on international resources. But, there are organizations like InSync that are trying to make the best of a bad situation, and some reputable zoos that try to educate the public. Ideally, organizations like InSync wouldn't need to exist, and that there would be heavy regulation on exotic animal ownership and no need to take in abandoned big cats.

Fiona Repp, aged thirteen, spends most of her time outside, studying, or both. She enjoys reading, spending time with friends, caring for her ever-growing menagerie, and training for bike races. At the moment, the menagerie consists of a cat, a kitten that thinks she's a dog, and an actual dog.

Thank you!

Isabella Kiedrowski

Lucinda Lodder Lindstrom

Claire Goodman

Elizabeth Medina

Fiona S. K. Repp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