

Carved Face on Log

There are qualities that separate individuals from others. I carved a piece of wood, an individual piece of wood, in a particular fashion forged by the culture that surrounds me. It is a living, breathing, individual carved by chainsaw, chisel, and router, with a specific personality that will make a distinct impression, just as an individual would. It is just as alive as I am. It will not last forever; in fact I plan to burn it when I'm done with it, or maybe leave it in the forest to rot. This carved face is meant to confront the labels of alive, existence, right and wrong. Look into the face and see that everything is just a collection of matter. Endow it with meaning, love, hope, and potential, and it will become alive before your eyes. Touch it and feel the chiseled and sanded skin of an individual, growing and dying. Afterwards, leave it and never look at it again, because all art is temporary, all art is life, and all life will end.

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Morals And Ethics: A Scientific And Logical Approach

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Since the dawn of civilization, there have been questions that have plagued philosophers and thinkers. What do we live for? What is right and wrong? Is there a god? Apparently we thought the answers to these questions were fairly important, because quite a lot of people have been brutally killed because they tried to answer them and other people disagreed with their conclusions. I'm hoping that trend has died out, because here I am trying to answer them.

I am writing this paper for a purpose. My purpose is to understand, mostly for my own sake, what is right and wrong, and how the different views on the issue affect our world. I am *not* trying to convert people from believing their own faith. I am *not* working against anyone's individual beliefs. I am only trying to sort out my own thoughts, and these thoughts are all coming from as objective of a lens as I can muster, viewing the world in terms of proof and evidence. It has long been thought that science cannot answer moral questions. In my mind, science *must* answer them, because no questions can be answered without proof and evidence. This is a statement of my own beliefs, which makes my conclusions ultimately subjective. I am trying to clarify and present my beliefs with logical and evidence-based arguments so as to convince myself that I believe them. I have no obligation to be nice when I am only writing for myself and my own beliefs, my only obligation is to be truthful.

Ethics and Morals are two terms that are often used to mean the same thing: A set of principles that govern what is right and what is wrong. Both of these terms can mean the same thing, but when a distinction is made, the difference is subtle. Ethics often refers to a set of external principles, something that governs a group of people, where morals can refer to an individual's own, internal principles. For the purposes of this paper, I will generally be using them interchangeably, because I am not interested in anyone else's internal or external set of rules, I am interested in what is right, and what is wrong.

Why do these definitions exist in the first place? Why does anyone think that anything is right or wrong? Most religions have something to say about this. God said, *thou shalt not kill*. Buddhism condemns all lying. Islamic rules dictate a certain percentage of one's income to be donated to the poor. It is undeniably helpful to believe in a higher power when asking what is right or wrong. Religions are full of rules, and excruciatingly specific rules at that: from how to greet someone to which direction one should face while sleeping.¹ If someone is trying to understand whether or not they should steal an apple, most major religions have a host of descriptions of the fiery hell that they will be damned to for eternity because of it. Ethics, in this case, are pretty clear. It makes sense why ethics, in the context of religion, would evolve: people didn't want their apples stolen. It is the same reason some of us tell our children that if they are naughty, Santa will be watching and put them on the naughty list. It's helpful for most people, except the thief, if nobody steals any apples. In a world where anyone can easily get away with stealing an apple, more motivation is necessary than just a sign that says "don't steal." Of course, this is only speculation. I cannot say for certain how any religion came into being, only think critically about the reasons why it still exists. Suppose Muhammad was truly visited by an angel. Would anyone have listened to him if that angel had told him to preach murder and rape? They probably would have dismissed him as insane with no followers, or locked him up, just as they did with many scientists that challenged the religious viewpoint of the world. Galileo, an astrologist that believed the earth to be round, was locked up by the church for his findings, because they challenged their beliefs and were deemed "heresy." Many lessons that religions teach are also things that we as a society view

¹ Robert Sapolsky, in his book, *The Trouble With Testosterone*, outlined many of these rules in comparison to the daily life of someone with OCD. It is fascinating how eerily compulsive the specific numerology and cleanliness is something that permeates both.

as ‘good,’ separate from religion. Most people believe that killing is, in fact, ‘wrong,’ and that donating to charity is ‘good.’ It is much easier to justify something as ‘good’ or ‘bad’ if you do believe there is a design to the world, and something made it that way. Otherwise, we humans are the highest level of intelligence there is, so any one of us could state an ethical ‘truth’ that would be just as valid as anything anyone else states.

What about the rest of the world? The ones that don’t believe in a higher power? What makes them do good things and not do bad things? It’s good for our genes. We didn’t get to our vast numbers on the planet by behaving completely selfishly all the time. In fact, there are people who dedicate their lives to *helping other people reproduce*: one of the many functions of a doctor in our society. We have built a world for ourselves so that each person can do one job, such as type at a computer or lay bricks, and still be able to survive because the rest of our species is doing all the other jobs necessary to maintain everyone else’s survival. Besides a few kinds of social insects, like ants and bees, we are the only other organism that relies this deeply on each other, and we are the only known organism that has the mental capacity inside of each individual to contemplate why we are doing any of it in the first place.² As a society, we praise those who put others before themselves, and look down upon those who put themselves first, using words like ‘greedy’ and ‘selfish.’³ In doing so, human society creates an interesting mutualistic relationship between each individual: If one person needs help, and another person helps, both are rewarded. One is rewarded with help, and the other is rewarded with social praise. Take a look at any preschool, and likely you will witness teachers speaking in approving voices to any child that sticks their neck out for a friend. Another example, and one I find slightly off-putting, is colleges and universities admitting the student with community service hours logged away. At first this seems a wonderful way to select students who also care about their community, until it becomes a chore for students to do in order to go to college, without any real regard for the people they are helping. I had a conversation with a peer recently who I was working on a presentation with about the environmental benefits of putting up solar panels. The thing I will remember about our collaboration is what she said after we finished: “I hope we get to present in front of the board so I can put it in my college apps.” Societal rewards are constant for being a ‘good’ person. So much so that I believe it is an inevitable case of operant conditioning. Just as a dog can be given a treat for sitting down over and over again until it will sit without the treat because it knows that sitting is the ‘right’ thing to do, isn’t it possible that we, humans, can internalize the constant social praise until we no longer need it to feel good about doing the ‘right’ thing?⁴

When people are ‘good’ to each other, it benefits our genes and creates the complex social structure that humans, ants, and bees have in common. When people are ‘bad’ to each other, it doesn’t, just as an ant would never murder it’s peer out of jealousy.⁵ The next logical step is to

² E.O. Wilson goes very in depth into the inner workings of social insects, and how it’s possible that a ‘group selection’ could be possible within these societies, as well as humans.

³ Richard Dawkins wrote a book called *The Selfish Gene*, where he laid out the evidence that our genes must always be slight “selfish” or they cannot be in the gene pool. He noted that even though it is just the way that genes are, selfish still has a negative connotation, despite the fact that he was in no way insinuating that genes are ‘bad’ in any way.

⁴ I’m not trying to say that this conditioning is bad, all I am trying to do is explain how it is possible that we believe things are good or bad without any evidence that they are. If someone does something because they believe it to be the right thing, even if it’s really just because they were conditioned to do so, does it matter that they were conditioned?

⁵ E.O. Wilson goes very in depth on ant social structure. A lot of their actions mirror our own, yet within each colony there seems to be extreme cases of individual altruism.

determine that people are ‘good’ to each other because of their genes. There is no gene that anyone has found that codes for being ‘good,’ yet if there is a genetic advantage to a behavior that an organism exhibits, this is enough for most scientists to determine that the behavior evolved as an adaptation to its environment. Therefore, I will be assuming that our acts of ‘good’ are evolutionary adaptations.

So, our genes make us nice to each other, and yet, we have morally justified years of war and suffering. How does this fit in to our structure of genetically beneficial morals? We have set up a society where people are praised for putting others first, but that extends all the way to putting other’s lives before one’s own. The ultimate act of altruism is the self-sacrifice for those we do not share genes with. The soldier who jumps on a grenade is hailed a hero. This is the product of people who simply believe that it is the right thing to do. Self-sacrifice has not stopped our population growth, in fact, it may have set a precedent for more people helping others. World War II had the largest death toll of any war in history. Millions of people all over the world signed up to fight, knowing that there was a high likelihood of never returning, and quite a lot did not return. This was the biggest opportunity for people to sacrifice themselves for the ‘greater good’ recorded. Yet, since then, we have more than tripled our population.⁶ This is also disturbing in the context of operant conditioning: someone can be raised in a specific way so that they will eventually fulfill their purpose as a meat shield for a grenade, and willingly, too, because that’s how they have been trained. Let’s say, to make things a little more clear, that there exists somewhere in our genome a string of DNA that codes for us to behave more altruistically. If we had a war that relied upon huge numbers of soldiers signing up to go fight and die for a ‘good’ cause, we might have quite a deficiency of this gene, due to the war naturally selecting the people among us most willing to give up their lives for what they believe is right. Yet, as a society, we still encourage people to have empathy, to be selfless, and to sacrifice themselves, which would select positively for the altruistic individuals. This selection for and against the trait at the same time would explain why everyone isn’t constantly giving up everything for others, yet also why everyone isn’t constantly stealing and murdering everyone else. Even though we know that there is probably not a single gene for altruistic behavior, we can still treat it as a behavior that may or may not be explained through genetics. Since we are able to see a clear benefit, genetically, from the behavior, we can assume that the behavior is an evolutionary adaptation. The balance is the best way for us as a species to maintain and grow our population and for the individual to pass on their genes.

The best case for any individual, genetically, is to be successful enough to produce fertile offspring, and enable their offspring to reproduce as well. So in our society, where we praise those who are selfless and punish those who are selfish, yet the most selfless ones can end up dying anyway, what is the best way to success? Richard Dawkins explains how a group of individuals (or rather, genes) can all behave altruistically, and still be on equal footing, yet when one of them behaves selfishly, that individual can control resources and reproduce much more, and will outcompete the altruistic individuals, simply by adding competition. Therefore, natural selection favors those who are selfish. However, human society needs an extra variable. Overtly selfish individuals are instantly demoted in the hierarchy, due to our own notions of right and wrong: we put tax evaders in prison, and look up to the billionaires that donate to charity. So, the best case for our genes is to be altruistic enough to rise in the social hierarchy, yet selfish enough to gain resources and not sacrifice one’s self for anything but the survival of our offspring or close relatives. Therefore, a billionaire who keeps hordes of money to themselves can be still seen as ‘good’ in our society as long as they donate a certain amount to charity. Also, it helps when

⁶ According to the U.N. population division *2017 Revision of World Population Prospects*.

everyone else is also altruistic, because otherwise your altruism could be taken advantage of. Thus, religion, or believing in an inherent right or wrong, (or at least preaching it so that *others* will believe it) would be beneficial. The reason we have morals and ethics is so that *other people follow them*. Once this is achieved, it becomes much easier for the feudalistic hierarchy of the church to be understood, and why many early societies functioned similarly and were directly tied to a religion. This only what is best for the gene, because the gene has a very specific purpose, as outlined by Dawkins, and that is to live and procreate. We are not genes, we are individuals, with much more complicated motives and purposes.

A behavioral adaptation is a product of evolution that results in a specific behavior that helps an organism survive longer or reproduce. Such adaptations include behavior such as hunting, where an organism may track and kill another for food, in order to survive. The job of an evolutionary biologist is to look at a phenotype of an organism (which includes behavior) and ask, “what benefit does this phenotype give to the organism and its genes?” The assumption is that the phenotype *does* give an evolutionary advantage, and that is why it evolved. Otherwise, in the billions of years of evolution, it is *assumed* to have been selected against and died out. This is a common assumption among evolutionary biologists, as put succinctly by Ridley, “We can confidently assert that there was nothing in our natures that was not carefully ‘chosen’ in this way for its ability to contribute to eventual reproductive success.”

It’s easy for most to wrap their heads around a mouse evolving to be small and fast to escape the cat, but harder to imagine why humans have a taste for pretty paintings. Why do we get special treatment? We exhibit some pretty fascinating behaviors, and many people assume it is because we are different, we want more than just survival and reproduction. This is likely because, for the most part, survival and reproduction are already a given, and most of the time it seems like we have other motives. And yet, we are still only organisms, built through the process of evolution. Take the human behavior of worshipping a deity, for example. This is a phenotype. What benefit does this phenotype give the organism and its genes? In a smaller society, the benefit could be a unification of the community, an increase in altruistic behavior because people are afraid of punishment from the deity, which can result in a host of things such as better infrastructure, the will to gather/farm/hunt more food for the community in order to please such deity. Overall, quite a lot of benefits. The downsides? Having a brain complex enough to comprehend something such as a deity comes with the possibility of getting depressed and killing oneself, starting a war with another society who worships another deity or believes a different thing is inherently ‘right’ or has a different culture. Is it net-beneficial to the gene? The answer is right in front of us. If the phenotype still exists today over vast numbers of individuals, then clearly it *must* have been evolutionarily beneficial. We can apply this to any behavior that humans exhibit. Art, music, entertainment, religion, government: It all comes down to evolution. As Matt Ridley states in his book on the evolution of human nature, *The Red Queen*, “Reproduction is the sole goal for which human beings are designed; everything else is a means to that end.”

We are capable of complex thought, growth, and behavior *because of our genes*. In the same way we call eating and drinking a natural instinct, coded in our genes, we can call a toddler learning a language a product of genes. Both rely on an external stimuli. In one case, food must be present for me to eat. In another, a language must be present for the toddler to learn. What was coded in its genes was its ability to learn quickly as a child and absorb every ounce of information specifically about language that it could. English happened to be the one laying around. It doesn’t matter what language I ended up with, because the potential was coded in my genes for me to be who I am today. And, because of the assumptions we make on the account of evolution, we must

assume that learning a language was net-beneficial to my genes. This is clear to see. It would be much more difficult to survive in today's world without being able to communicate, orally or otherwise, and almost impossible to reproduce.

Think about the very first life forms. In the primordial soup, a bunch of elements swam around in a hot bubble of water. What would happen was something that was bound to happen, the elements bonded in ways that they were most stable, creating simple proteins simply because they were more stable that way. Eventually, these became more complex through the first forms of natural selection. The weaker proteins were outcompeted by the stronger ones. Then, fatefully, there was the one replicator, the one protein that could divide and copy itself. Natural selection took its course, and a few billion years later the replicators built huge machines around them in order to propagate.⁷ We are those machines. At some point down the line, creating a brain structure that was more than just a list of do's and don'ts became something beneficial. A brain structure that held purpose in mind: grow and mate. As there was more competition, there became more complex brain structures, to the point where the organisms could model things in their brain rather than just blindly eating and mating. Eventually, the brain became complex enough to model the world so completely as to include a model of itself. And thus was born the conscious brain! We have art, music, architecture, paper, computers, religion, all because of this small adaptation of the replicators inside of us. All because it has made it easier to reproduce, and the organisms that go along with it tend to replicate more. If we are attracted to places with more art and music, with intelligent life and entertainment, then that makes most of human culture the equivalent of the bright plumage on birds in mating season. Is it working? We have been growing as a population at an alarming rate, and are becoming increasingly more dependent on one another, with more and more of an appetite for entertainment than ever before.⁸ Yes, it's definitely working.⁹

Sometimes, of course, it doesn't. People kill themselves. This evolutionary adaptation of consciousness occasionally overpowers our instinct to survive and reproduce. If everything about our society and culture is truly the product of our instinct to reproduce, how is it possible that they let things like this happen? Genes aren't perfect. They are not gods, only tiny blind pieces of information. They do not "want" anything, they simply survive a long time if they are capable of doing so, and don't survive if they aren't. In the world around us, we see animals and plants that are successful in their own environments, and even so losing out to others all the time. Bacteria is constantly being killed almost everywhere, yet it is prevalent on almost everything we touch. An ant colony may lose a few ants in a battle with a spider, but ultimately will come out stronger, without the spider in the way. A mother may sacrifice her life for her children, so that even though her genes are gone, there are other versions of her genes who will rise to take her place and live on. We have evolved a consciousness and an individual intelligence along with a collective intelligence greater than any other species on the planet, so much so that we have eliminated the need for most individuals to struggle to survive. You no longer need to hunt for your food. You no longer need to struggle to find shelter every night. We can busy ourselves watching movies and

⁷ This theory, developed in the 1970's by Richard Dawkins, changed how biologists viewed organisms for good. Instead of simply describing the parts and pieces of organism anatomy and behavior, the new necessity was function. If there was a part or behavior of an organism that did not have an evolutionary function, then it therefore had no place on the organism.

⁸ In only the last few years, the average American expenditure on entertainment has risen 12.5 percent, according to the Bureau of Labor Statistics.

⁹ This is not to imply that we should not be alarmed by our population growth. Our genes have never experiences such dense population, and are not omniscient They will only ever adapt to the immediate consequences of their actions. It is entirely possible that populating the world so much will be their undoing.

reading books rather than sowing seeds and defending your children from the creatures of the night.¹⁰ At what cost? Sometimes that consciousness and intelligence gets the better of us, and we fall into a depression or go to war against each other. Our genes are still working to make our lives easier, only balancing the cost of adapting a conscience with the benefit of the society we have built.

I can say for certain that, in a sense, morals exist. People have their own opinions about ‘right’ and ‘wrong,’ and we can classify those as morals. The difference is that those morals are strictly in our heads. You may say that something is the right thing to do, but if I say that it is actually the wrong thing to do, who is in the right? Neither of us, because we are simply stating things without any actual evidence to back it up. Sure, you may say that insulting someone is bad *because* it causes someone else to suffer, but really, what you would be trying to say is that you believe that suffering is inherently bad, without any proof to back that up. The belief that there is an inherent right or wrong is akin to the belief in a higher power, for both are based in faith of an idea not based in logic. The reason we don’t want people to suffer is because we also don’t want ourselves to suffer. The belief in a higher power, or laws of good and evil, are ideas that can help things to be ‘right’ and void of ‘evil.’ This does not mean that they are necessarily objective truths. Objectively, things just *happen*, and as a society we project meaning onto those things. We don’t have an inherent purpose, but if you believe that your purpose is to spread good and love into the world, then you might end up happy. Just because something is the truth does not mean we should all believe it, because ‘should’ and ‘shouldn’t’ are also constructions from the belief of right or wrong.

So, nothing is right or wrong, everything is neutral, and nothing we do matters. Well, not necessarily. Just because something doesn’t have meaning to begin with does not mean that we can’t or shouldn’t project meaning onto it. In fact, we do this every day and we are all conscious of it. We are constantly exchanging little bits of paper for much larger, more (subjectively) valuable things. We know that these pieces of paper, or even just pixels, are just what they are, paper and pixels, yet we choose to collectively project meaning and value onto them. Why? Because it makes daily life easier, and it contributes to our society in a way that we deem ‘good.’ If there was a person who truly believed that a one dollar bill was inherently endowed by a higher power to be worth less than a twenty, and exactly as much as a candy bar, would it matter? Not at all, because they could still be functioning members of society. In fact, if everyone believed that, then maybe it could eliminate inflation. As the saying goes, ignorance is bliss. In this case, it is (subjectively) beneficial for the society if some people are ignorant.

Is this just the case for money? Or are there other ways that ignorance results in a “what they don’t know won’t hurt them” situation? If someone goes to church every Sunday, believes that by doing so, and by acting in accordance of certain values, they will eventually go to heaven, and contributes to the greater society because of it, who are we to say that is the wrong thing to do? We don’t get frustrated at dogs for not knowing the earth is round, because they are happy not knowing. So whatever you believe, be it God or Allah, or Nirvana, there’s no point in me ruining your bliss. Being religious is a choice that has the potential to make society a more pleasant place,

¹⁰ Unfortunately this isn’t the case for all of humankind. This further proves that we do not fully embrace our ideas of right and wrong, as we consistently take advantage of other, perfectly similar individuals who labor for us across the world without batting an eye. We are still blissfully ignorant of our own creation: a system of hierarchy based on ethnicity and location. In many ways, ignoring this is similar to believing that there is an inherent right or wrong, or that one day when we die we will go to heaven for eternity. It is ignoring the facts so that we can feel better about the things that we do in our daily lives.

by believing things that aren't objective fact.¹¹ Unfortunately, it also has the potential to do a lot worse. Hence, it has a bad reputation among a lot of circles. I was talking to a mentor who said that they believed organized religion to be one of society's "greatest evils." The sheer amount of war and suffering done on behalf of religion, or a core set of beliefs that are justified through false objectivity, is staggeringly high.¹² So is it wrong to be religious? Should we look down upon those who put faith in things that aren't objectively true? That depends on what we value, what we see as our *purpose*.

Purpose: the one thing that can separate right from wrong. It's easy to see on a small, low stakes scale. A pair of scissors has a purpose, and that purpose is to cut. Therefore, using the scissors to hammer in a nail would be the 'wrong' thing to do with the scissors. Despite this, we know that the scissors have no inherent purpose, and the only reason we know that they are for cutting is because everyone says they are. We project the purpose on the scissors, likely because it's much easier to cut paper with scissors than, say, a rock. We made the scissors, true, but doesn't mean that they are inherently purposeful because of that. However, if I declared that the right way to use scissors was to hammer in nails with them, how could anyone possibly argue with me? They couldn't, only by stating that it might be easier to use a hammer. Now is about the point in my argument where the reader might be thinking that I am about to say that murder and rape and torture are justifiable. While my emotions tell me that I do not want to talk about these things as if any of it should ever happen, I still have a point to make, and I have an ideology that would be incomplete without making my point. So let me explain.

If there existed someone out there who truly believed that murdering innocent people is their purpose, then in terms of *that purpose*, and that alone, then the right thing to do would be to murder. The same goes for all of the horrible atrocities that humankind has ever committed. Believing they are right is no different than believing they are wrong, other than the fact that most people would probably agree that nobody's purpose should be to commit such atrocities, because nobody wants those things to happen to themselves. In fact, there could be a person who believed that suffering was the right thing to do, and they could even believe in the same things that Christians believed, only that they saw their purpose as pissing off God and going to hell. In that case, for that purpose, the 'right' thing to do would be to do the opposite of everything that Christians believe to be the 'good' thing.

So I've gotten to the point where there isn't many more places I can go. I've explained my theory of purpose, and also how we are only products of the gene. It's enough to put a damper on my self worth, and maybe yours as well. But, there is a reason, deep and tangled somewhere in my thoughts and feelings, that I don't just give in to the world. There is a reason why I am writing this, despite the fact that, as I have stated, it might be better if nobody believed me. Even though we are aimlessly walking on a planet in an galaxy that doesn't care, we still have our emotions. We still have this complex thing inside of us that we call consciousness. And we can use that to imbue importance into anything that we want. In my case, I must come to terms with the fact that it doesn't naturally have any meaning, but I can continue my efforts despite their inherent futility nonetheless. Albert Camus, a philosopher who wrote about absurdism, was obsessed with the myth of Sisyphus. Sisyphus was a man in Greek Mythology who tricked the gods out of death several

¹¹ By "choice," I mean in terms of the free will of the human brain. If our actions are controlled by genes and past experiences, then nothing is truly a "choice."

¹² Depending on definitions, almost all wars can be traced back to a set of beliefs that were incorrect. Of course, whether or not each example counts as a "religion" is up for interpretation. It is undeniable that there are similarities.

times. When he finally succumbed to mortality, he was punished with the task of rolling a boulder up a hill, but when he reached the top, it would roll back down, and we would be forced to start again, over and over, for eternity. Camus compared this to our search for meaning and purpose in the world. It may be completely futile, and the only way to come to terms with that is to accept that as our purpose. Sisyphus's purpose became rolling that boulder, and he worked hard for it. He may even have come to believe it was the right thing to do. Mankind's purpose may not be so clear, but we can give ourselves purpose, just as we give a pair of scissors purpose. And who knows? Maybe the scissors are happiest when hammering in a nail.

Bibliography

- Dawkins, Richard. *The Selfish Gene*. Oxford University Press, 1976.
- Dawkins, Richard. *The Blind Watchmaker*. Penguin, 1986.
- Sapolsky, Robert M. *The Trouble with Testosterone: and Other Essays on the Biology of the Human Predicament*. Touchstone, 1998.
- Sapolsky, Robert M. *Behave: The Biology of Humans at our Best and our Worst*. Penguin, 2017.
- Ridley, Matt. *The Red Queen: Sex and the Evolution of Human Nature*. Penguin, 1993.
- Camus, Albert, and Justin O'Brien. *The Myth of Sisyphus: and Other Essays*. Vintage Books, 1959.
- Goodman, Charles. "Ethics in Indian and Tibetan Buddhism." *Stanford Encyclopedia of Philosophy*, Stanford University, 1 Feb. 2017, plato.stanford.edu/entries/ethics-indian-buddhism/#BasTeaBudEth.
- Britannica, The Editors of Encyclopaedia. "Pillars of Islam." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., 1 June 2018, www.britannica.com/topic/Pillars-of-Islam.
- Chalabi, Mona. "100 Years since the First World War: Numbers That Show What Has Changed." *The Guardian*, Guardian News and Media, 16 Jan. 2014, www.theguardian.com/news/datablog/2014/jan/16/100-years-since-ww1-numbers-change-photographs.