

**RELIGION AS A NATURAL KIND:
THE BIOLOGICAL AND SEMANTIC SEARCH FOR A DEFINITION**
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Jeffery L. Johnson
Department of Philosophy
Eastern Oregon University

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I.

There used to be a discipline called speculative psychology. It wasn't quite philosophy because it was concerned with empirical theory construction. It wasn't quite psychology because it wasn't an empirical science. But it used the methods of both philosophy and psychology because it was dedicated to the notion that scientific theories should be both conceptually disciplined and empirically constrained. (Fodor 1980, vii)

What follows is an essay in what might be called "speculative theology." It uses both the methods of philosophy, theology and cognitive science. It is, therefore, quasi-empirical, while at the same time, candidly humanistic. It seeks to use insights from anthropology, linguistics, and evolutionary psychology to address the classic philosophical and theological problem of defining *religion*. In brief, the argument is that the best explanation of the ubiquity of religion in all human societies is that a genetic predisposition for religious sympathy and practice has been hard-wired into the human brain by the forces of natural selection; it is part of our basic human nature. Articulating this neurobiological essence in everyday language offers hope for a perfectly general definition of religion. It should go without saying, of course, that almost every step in the argument to follow is scientifically, theoretically, and theologically controversial.

I must admit at the outset that there is a kind of chicken and egg circularity to my strategy. I need as a central part of my argument the anthropological evidence that, as Richard Dawkins says:

[t]hough the details differ across the world, no known culture lacks ... religion. Some educated individuals may have abandoned religion, but all were brought up in a religious culture from which they had to make a conscious decision to

depart. ... Religious behavior can be called a human universal in the same way as heterosexual behavior can. Both generalizations allow individual exceptions, but all these exceptions understand only too well the rule from which they have departed. (Dawkins 2006, 166)

The problem is that this widely conceded generalization seems to depend on some already agreed upon criteria for what counts as religion in the first place. Thus the project appears to demand a definition of religion in order to defend an empirical definition of religion. This quandary may not be as serious as it first appears. Social and natural scientists often find themselves in positions where a range of phenomena seem plausibly grouped, but no underlying theory (or definition) as yet specifies the exact nature of the group. One might consider the historical example of physicists trying to understand, and hence define, the nature of *electricity*, or the very contemporary example of defining *species* in biology.¹ When all is said and done, Max Weber might have got it right a century ago – “Definition can be attempted, if at all, only at the conclusion of a study.”²

II.

If you want a *good* rule-of-thumb generalization from anthropology I would suggest the following: Any sentence that begins, "All societies have ..." is either baseless or banal. (Shweder 2005, 4)

As alluded to above, my argument starts with a fact, actually two related facts. With due respect to Clifford Geertz, a towering figure in cultural anthropology, many scholars would be comfortable with the claim that *all societies have* religion and would add that this has been true of human societies for as far back as we are able to know anything about human societies. These scholars would further insist that this generalization is based on solid empirical investigation and is the exact opposite of banality from the perspective of our understanding of

human nature and society. These two facts are articulated not just by skeptical, secular scholars, but also by thoroughly sympathetic religious scholars like John Hick:

When we look back into the past we find that religion has been a virtually universal dimension of human life -- so much so that man has been defined as a religious animal. For he has displayed an innate tendency to experience his environment as being religiously as well as naturally significant, and to feel required to live in it as such. (Hick 1993, 133)

If we accept the ubiquity of religion, the question becomes its explanation. Why is it that all societies for at least 50,000 years have had religion? We will be highlighting one intriguing answer to this question that is at the forefront of much contemporary research.

III.

The different encounters with the transcendent within different religious traditions [are all] encounters with the one infinite reality, though with partially different and overlapping aspects of that reality. (Hick 1993, 139)

Given the ubiquity of religion, and the depth of belief that it engenders, the most straightforward explanation of the universality and pervasiveness of religion is what we might call *realism*, or in the specific case we shall look at below, Christian realism. Any creed makes assertions and buys into an implicit, and often explicit, ontology. The realist says that these assertions and ontological commitments are true -- they represent (theological) things as they *really are*.

[M]an is not a mere animal but differs from the beast in having an immortal soul and a religious instinct. The argument is as follows: Assuming there are no races which can be shown to be utterly devoid of religion, this element of human thought, because it is universal, we must consider as essential; hence, being essential, belief in a soul and in spiritual life is part of human nature; based on this natural conviction religion is the product of man's religious instinct. (Hopkins, 1923, 1)

John Hick's notion of religious pluralism is usually portrayed in contrast to the realist tradition, but in a sense it simply urges a more inclusive sort of religious realism. Humankind has believed in something supernatural, something transcendent, something of ultimate significance in every known culture for as far back as we have been a species. Why is that? Because, the religious pluralist answers, reality includes not just the physical, natural world, but something supernatural, transcendent, and of ultimate significance, as well. But, the skeptic counters, these cultures and religious traditions have described the transcendent in radically different terms -- "each is refuted by all."³ Not at all, replies the pluralist, indeed this is only to be expected.

Each of these two basic categories, God and the Absolute, is schematized or made concrete within actual religious experience as a range of gods or absolutes. ... [T]he particularizing feature ... is the range of human cultures, actualizing different though overlapping aspects of our immensely complex human potentiality for awareness of the transcendent. It is in relation to different ways of being human, developed within civilisations and cultures of the earth, that the Real, apprehended through the concept of God, is experienced specifically as the God of Israel, or as the Holy Trinity, or as Shiva, or as Allah, or as Vishnu . . . And it is in relation to yet other forms of life that the Real, apprehended through the concept of the Absolute is experienced as Brahman, or as Nirvana, or as Being, or as Sunyata. (Hick 1989, 245)

The realist, either in the guise of the Christian realist or the religious pluralist, therefore has a perfectly straightforward explanation of the ubiquity of religion.

V.

Consider, for instance, one of Mozart's compositions, one that is retained stably in our concert repertoire. The reason for its retention is not that the notes of the work are printed in particularly durable ink. The persistence with which the Mozart symphony reappears in our concert programmes is solely a consequence of its high selection value. In order for this to retain its effect, the work must be

played again and again, the public must note of it, and it must be continually re-evaluated in competition with other compositions. (Eigen 1992).

Darwin's two theories of common descent and natural selection teach us that biological good tricks, like the eye, or opposable thumbs, appear on the scene, and because they are good tricks they allow those organisms possessing them to out-compete those not possessing them. The gene replicates itself in each generation and competes with other genes.⁴ Music seems analogous in surprising ways. A symphony, rock hit, or musical style, replicates itself each time it is performed, listened to, or downloaded off the internet. It competes with other symphonies, rock songs, and musical styles. Many compete less successfully and fade away, a few become standards in the concert repertoire, or rock classics, and, of course, the jury is still out on hip-hop.

Music, symphonies, rock songs, and the like are ideas, or *memes*, that survive by sticking in our consciousness in mysterious ways that cognitive scientists are just beginning to understand. Other memes, however, survive because they are good tricks in ways directly analogous to eyes and opposable thumbs. They do good things for humans and human societies. Dennett offers a list that includes several good cultural tricks:

arch; wheel; wearing clothes; vendetta; right triangle; alphabet; calendar; the *Odyssey*; calculus; chess; perspective drawing; evolution by natural selection; impressionism; "Greensleeves"; deconstructionism (Dennett 2006. 344)

Many scholars have suggested that religion is a good trick that does something necessary within the society. The classical accounts of religion in anthropology and social psychology -- Tylor, Freud, Durkheim, Geertz, etc. -- all treat religion as performing an important function within a culture. They disagree, of course, as to exactly what this function is, but they agree

that it is crucially important to, and for some the survival of, the culture, and that religion is uniquely suited to performing this function.

No one would ever suggest that there is a gene for using arches or alphabets. Their close to universal adoption in cultural history is simply a product of their utility. The selection process that allows these memes to thrive is purely cultural. But many recent thinkers have seen this process as evolutionary, none the less.

During the course of social life, there is a continuous stream of variations in the way individuals think and behave, and these variations are continuously tested for their ability to increase or decrease well-being. This testing or screening may proceed with or without a conscious weighing of costs and benefits by individuals. The important point is that some variations turn out to be more beneficial than others and are preserved and propagated within the group (or subgroup) and across generations, while other variations that turn out to be less beneficial are not preserved or propagated. (Harris 1990, 127)

Perhaps the most universally accepted explanation of the ubiquity of religion within the academy sees it as a product of memetic, or cultural, evolution. Religion thrives because it is culturally adaptive.

'Religion' holds society together, sustains values, maintains morale, keeps public conduct in order, mystifies power, rationalizes inequality, justifies unjust deserts, and so on (Geertz 2000, 15).

V.

We have particularly compelling reasons for investigating the biological bases of religion *now*. Sometimes--rarely--religions go bad, veering into something like group insanity or hysteria, and causing great harm. Now that we have created the technologies to cause global catastrophe, our jeopardy is multiplied to the maximum: a toxic religious mania could end human civilization over night. We need to understand what makes religion work, so we can protect ourselves in an informed manner from the circumstances in which religion goes haywire. (Dennett 2006, 71-2)

The view of religion as a parasite has garnered the most attention in the popular media because of the aggressive anti-religion tone of champions like Sam Harris (Harris 2004) and Richard Dawkins (Dawkins 2006). But it is important to remember that what is being asserted is not a biological mutation, but a cultural one. Since religion is ubiquitous, its biological basis must be explained before we can begin an examination of the cultural forces that leads to inquisitions and jihads. Daniel Dennett is always careful to distinguish in his evolutionary story of religion the genetic aspects that natural selection may have been acting on, from the memetic aspects that cultural selection utilized. All of the religious skeptics, Harris, Dawkins, Pinker, and to a lesser extent, Dennett, believe that natural selection altered human consciousness in such a way that religious behavior became part of human (biological) nature.

[U]nderstanding the origin, composition, and persistence of religion and the supernatural beings it features requires an understanding of the evolved human mind. ... Due to a long history of adaptations designed for interaction with the world “out there”—in particular with *others* “out there”—humans today possess a powerful set of cognitive endowments that make their minds particularly good at producing and transmitting god concepts—and, as consequence, religion itself. (Tremplin 2006, 10)

VI.

Evolutionary adaptations are functional biological designs naturally selected to solve important and recurrent problems in ancestral environments, such as hands for grasping objects. Evolutionary by-products are necessary concomitants of adaptations that were not selected for their direct utility. Nevertheless, by-products can acquire or co-opt functions for which they were not originally designed, such as knuckles for fighting and fingerprints for tracking personal identities. (Atran 2002, 21)

When Noam Chomsky first proposed a biological, and hence evolutionary, account of human language acquisition, he went out of his way to insist that the “language organ” had not been directly selected for, but was an indirect result the evolution of larger and more complex

brains. His main concern was that in his estimation there had not been sufficient time for this complex behavior to have evolved for its own sake. Steven Jay Gould agrees, and sees language as a *spandrel* (Gould and Lewontin 1979), but is less concerned with time than the details of language itself.

What about language, the most common denominator and distinguishing factor of humanity? And I don't mean using sound or gesture for communication, as many complex animals do. I refer to the unique syntax and underlying universal grammar of all languages. I can't prove that language was not the selected basis of increasing brain size, but the universals of languages are so different from anything else in nature, and so quirky in their structure, that origin as a side consequence of the brain's enhanced capacity, rather than as simple advance in continuity from ancestral grunts and gestures, seems indicated. (Gould 1993, 321)

By far the most common evolutionary account of religion sees it a spandrel. The arguments for this hypothesis are both positive and negative. It is common to attack the adaptationist accounts as failing to distinguish the group advantages religious belief from belief in Mickey Mouse or Marxism.⁵ If shared belief in something beyond the group's immediate environment proves advantageous to group solidarity and survival, why would this something necessarily be religious? In addition, if religion is useful at a more individual level, say by providing comfort in the face of evil, death, and the unfairness of the natural world, why would belief in something counterintuitive (and for many of the skeptics, almost certainly false) provide comfort? And even if it did, why would this enhance the individual's chances of surviving (as would seem required for it to be an adaptation)? We will see in the next section that adaptationists with respect to religion have potential answers to these questions, but there is consensus that they pose serious challenges.

To my mind, much more interesting are the positive accounts that the by-product theorists offer. I dare any of my readers to watch a short internet video that recreates the famous Heider-Simmel experiment and not see a fairly complex little narrative.⁶ Objectively what appears on the screen are line segments, two triangles, one large and one small, a small solid circle, and a good deal of motion involving these geometric shapes. What we all see, however, are three creatures, a kind of structure that keeps these creatures in and out, and a drama where the two smaller creatures are threatened, attacked, chased by, and ultimately prevail over the larger creature. We cannot help ourselves; we impose, agency, causality, and intentionality to the motion of the geometric shapes.

Hardships of early human life favored the evolution of certain cognitive tools, among them the ability to infer the presence of organisms that might do harm, to come up with causal narratives for natural events and to recognize that other people have minds of their own with their own beliefs, desires and intentions. Psychologists call these tools, respectively, agent detection, causal reasoning and theory of mind. (Henig 2007)

Evolution, so the by-product theory goes, has hardwired the human brain to perceive the world in terms of agents, with minds, behaving in a world of cause and effect. The religion meme piggybacks on these more basic, but clearly adaptive features of the human mind.

In addition, according to Paul Bloom, we are ***natural born dualists***:

For those of us who are not autistic, the separateness of these two mechanisms, one for understanding the physical world and one for understanding the social world, gives rise to a duality of experience. We experience the world of material things as separate from the world of goals and desires. The biggest consequence has to do with the way we think of ourselves and others. We are dualists; it seems intuitively obvious that a physical body and a conscious entity—a mind or soul—are genuinely distinct. We don't feel that we *are* our bodies. Rather, we feel that we *occupy* them, we *possess* them, we *own* them. (Bloom 2004, 7)

If we are indeed hardwired to see the world as dualists, this would explain a great deal besides the origin and ubiquity of religion. It would not be surprising, for example, that articulating a naturalistic theory of human consciousness would prove to be so difficult. But it is quite easy to speculate that the addition of innate disposition to see a realm of reality beyond, or at independent from, the physical world perfectly completes the package for religion; now we have other-worldly intentional agents causally interacting with this world.

VII.

Natural selection is a multilevel process that operates among groups in addition to among individuals within groups. ... Moral systems include both an innate psychological component and an open-ended cultural component that enables groups to adapt to their recent environments. Belief in supernatural agents and other elements that are associated specifically with religion can play an important role in the structure and function of moral communities. (Wilson 2002, 43-4)

David Sloan Wilson tells a fascinating "just-so" story of the genuinely adaptive value of religion. His argument candidly relies on two major theoretical assumptions, at least one of which remains hugely controversial in evolutionary biology. The first, and least problematic, is his claim that both genetic and memetic evolution can work simultaneously, and indeed, hand in hand. Consider, for example, milk consumption in adults. The cultural meme of domesticated cattle almost certainly led to the biological evolution of human adults who could continue to consume milk past weaning -- pretty much unique in mammals (Wade, 2006). The second is that natural selection works not only on individuals, but on groups as well. So thorough is endorsement of group selection, and group adaptive phenotypes, that for his purposes groups become, not just metaphorically, but literally, organisms.

Any unit becomes endowed with the properties inherent in the word organism to the degree that it is a unit of selection. The history of life on earth has been marked by many transitions from groups of organisms to groups as organisms. Organistic groups achieve their utility with mechanisms that suppress selection within groups without themselves being overtly altruistic. Human evolution falls within the paradigm of multilevel selection and the major transitions of life. (Wilson 2002, 43-4)

Suppose we begin with preconditions for religious belief identified by Altran and Bloom. Human ancestors would have likely benefited from changes in neural architecture that predisposed them to find agency, causality, and intentionality within the challenging environment in which they found themselves. A strictly adaptationist account of these cognitive features is easy enough to construct. In addition, if the tendency to bifurcate reality into physical and mental realms is also innate, and of adaptive value, we have in place all of the ingredients for robust religious belief and practice. But why do these costly and minimally counterintuitive, beliefs persist? It is here that co-causality between culture and natural selection, and group selection, enters the picture.

Religion, as we have stressed many times, has a clearly cultural dimension -- it is taught, regardless of its biological underpinnings, from generation to generation (in ways that mirror almost perfectly the way that native speakers, regardless of their biological hardwiring for a syntax, acquire the semantics and surface-structure grammar of their language through their environment). Wilson insists, following a long and distinguished list of theorists from the social sciences, that religious belief and practice gave those groups that embraced it and nurtured it significant adaptive advantages over those groups that did not.

Since the ubiquity of religion goes back at least 50,000 years, before human hunter-gathers left Africa, both the groups and the proposed adaptive value must be understood in this

context. Hunter-gather societies were small, close-knit, and often doing battle with other hunter-gather groups. Presumably they consisted of economically rational individuals committed to maximizing their own personal and genetic utility; that is they possessed the all too human tendency to behave selfishly. So how does the group manage to suppress the innate selfishness of the individuals and cause them to put the interests of the group ahead? Not by force, threat, law or punishment. There simply was no Hobbesean sovereign to be in charge, to issue the threats, administer the punishment. Wilson emphasizes that hunter-gather societies were radically egalitarian.

Anthropologists don't agree on much, but they appear to agree that modern hunter-gather societies around the world are remarkably egalitarian. ... Hunter-gather are egalitarian, not because they lack selfish impulses but because selfish impulses are effectively controlled by other members of the group. ... In human hunter-gather groups, an individual who attempts to dominate others is likely to encounter the combined resistance of the rest of the group. (Wilson 2002, 21)

Notice that we have the interplay of natural and cultural selection here. It is not hardwired neural circuits that produce the egalitarianism but good old fashioned cultural practices.

In addition, hunter-gather groups were in competition. In the biologist's sense, some would be more successful in continuing, thriving, and replenishing the members of the group. But they were also engaged in much more literal and violent competition in the form of war.

War seems to have been the natural state of human hunter gather society. "Peaceful pre-state societies were very rare; war between them was very frequent, and most adult men in such groups saw combat repeatedly in a lifetime." (Wade 2009, 25)

The evolutionary good trick that solves all of these group problems in hunter-gather cultures, of course, is religion. Nicholas Wade, building on Wilson and others, argues that the internal problems of setting the rules, and enforcing them, is beautifully solved by religion.

A system of supernatural punishment carries enormous advantages for primitive society. No one has to assume the thankless task of meting out punishment and risk being killed by the offender or his relatives; the gods perform this chore willingly and vigilantly.

No legislation is needed: the list of offenses and associated punishment is set out in religious ritual and kept well in mind by all believers. No police force is required; believers restrain their own behavior, and are consumed by fear of divine retribution for any sin they commit. (Wade 2009, 55)

Even more important, according to Wade, is religion's contribution to group success in war.

Religion evolved as a response to warfare. It enabled groups to commit themselves to a common goal with such intensity that men would unhesitatingly sacrifice their lives in the group's defense. Because this remarkable behavior has become engraved in human nature, people throughout history have died in defense of the religion and their fellow believers, putting their own and their family's interests second to what they considered a higher cause. (Wade 2009, 233-4)

VIII.

[T]he only very general thing we can say about what we do when we evaluate evidence is rather coarse-grained. When we *do* prefer one member of a list of rivals to others, we do so simply because it comports best with the data we have, against the background of our relevant knowledge. Some rivals score better in some ways, others in others. We weigh the tugs in all directions and judge one rival to 'fit' better than the others, all things considered. ... So at bottom it is always a complex judgment of fit: which one fits most easily with everything we know about the matter. (Wright 1982, 6)

Coarse-grained, indeed, but still something we are pretty reliable at. After all, our determinations of criminal guilt in jury trials or scientific truth in the laboratory are based on our confidence that we can spot the best explanation of the facts offered as evidence in the trial or the experiment. It's unrealistic, of course, to expect the kind of intersubjective agreement we hope for in courts or laboratories, in areas as abstract and controversial as theology and evolutionary psychology. Nevertheless, some assessment of the explanatory strategies for accounting for the ubiquity of religion must be hazarded.

I have already endorsed some version of the biological account. Surprisingly, only one of the accounts we have discussed is logically incompatible with this theory when stated in its most general form. The ubiquity of religion cannot simultaneously be explained as ***totally*** a product of ***cultural selection***, while at the same time as ***partially*** a product of ***natural selection***, as all versions of the biological theory insist. The problem that the purely cultural account has is the absolute ubiquity of religion. Alphabets, arches, and calculus have clear advantages for cultures that embrace them, and it is therefore not surprising that we find them playing prominent roles in so many different cultures. But at the same time, there are other cultures in which, for whatever historical reasons, they have no role whatsoever. Religion, like language and morality, is to be found in every culture.

The principle evidence for thinking religious behavior is an evolved part of human nature is the fact that religion is universal. Every known society possess some form of religion. And though there are wide cultural variations—religions across the world are very different from one another—there are also many shared elements. These constant or almost constant features of religious behavior are the ones likely to have a genetic basis. (Wade 2009, 40)

Now I certainly concede that religion could be purely cultural, but I find that a much less plausible account than the biological hard-wiring explanation. None of this, of course, means that cultural factors do not play a huge role in religious practices and dogma.

The biological account is perfectly compatible with both religious realism and religious pluralism. An evolutionary origin for religious belief and practice is no more incompatible with religious truth than any other aspect of evolution, and indeed, for theists, a biological mechanism to support faith and enlightenment could have been a part of God's plan. I realize, of course, that many realists, and probably some pluralists, will have major problems with any evolutionary account of any part of the human, let alone religious, story. With those thinkers I

must merely agree to disagree. My whole argument presupposes the basic truth of the neo-Darwinian paradigm, and for that I offer no apologies.

As to the debate between the benign by-product theorists, the religion-as-a-virus theorists, and the adaptationists, much more theoretical and empirical work needs to be done. There is no doubt that the by-product hypothesis and the adaptation theory are logically incompatible, indeed that is the whole point of the distinction. As things stand, the spandrel account enjoys the most theoretical support. I confess a fondness for the adaptationist view, but for the purposes of this argument the details and evolutionary history of the agreed upon hard-wiring for religion are unimportant.

IX.

Religion, in the largest and most basic sense of the word, is ultimate concern. And ultimate concern is manifest in all creative functions of the human spirit.⁷

Definitions of religion seem to suffer from one of two polar opposite defects – they either include too much or too little. Take Tillich’s famous definition of religion above. It is an admirable model of inclusion – no one's belief system is left out. But that is what finally proves fatal to the definition, at least in the unqualified form I have quoted it here. I have many colleagues whose commitment to the environment, feminism, or the evils of the corporate culture would count as "being grasped by an ultimate concern." Their adherence to, say, the feminist cause and world view, may be held with "religious fervor." But it seems wrong, from a linguistic point of view, to characterize feminism as being a religion. Tillich’s views on religion are more subtle and complex than these two brief quotes may indicate. But the slogan of “ultimate concern” has been used as a definition of religion in some very influential Supreme Court cases.

In *United States v. Seeger* (380 U.S. 163), the Supreme Court was forced to decide whether individuals were entitled to conscientious objector status, even though they did not profess belief in the standard Judeo-Christian concept of God, or as the Selective Service act specifies, a Supreme Being. The problem for the Court was to articulate some understanding of **religion** within the First Amendment.

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof

Their strategy was to find a very inclusive “definition” of religion in legal precedent, and the thoughts of distinguished theologians. To that end they make much use of Tillich, including the following.

And if that word [God] has not much meaning for you, translate it, and speak of the depths of your life, of the source of your being, of your ultimate concern, of what you take seriously without any reservation. Perhaps, in order to do so, you must forget everything traditional that you have learned about God. (Tillich 1940, 57)

If we take Justice Brennan as understanding that religion in the United States Constitution is to be construed as ultimate concern, just exactly what kind of definition is this? I think it can helpfully be seen as a stipulative definition. It is unlikely that he is suggesting that dictionaries be rewritten, and he certainly is not pretending that the Court’s opinion is a careful bit of conceptual analysis. We often find ourselves in positions where there is a continuum between two important characteristics and a vague borderline zone between them. Consider, for example, the difference between being a child and an adult. We must make some sort of arbitrary dividing line for the purposes of deciding who may drive an automobile, vote, or legally consume alcohol. Interestingly enough, most states stipulate this dividing line differently for the three different behaviors. One important decision the Court must make, indeed citizens must make, is what sorts of behavior and beliefs are included under the First Amendment’s religion clauses. For this purpose it’s hard not to applaud the Court’s decision to err on the side of including too much. But we should not forget that such a decision is, by its very nature, arbitrary. And just as being an adult for the purposes of driving may be very different from being an adult for drinking

or voting, ultimate concern may be useful for First Amendment jurisprudence but quite unhelpful, or even misleading, in many other contexts.

X.

Consider for example the proceedings that we call "games". I mean board-games, card-games, ball-games, Olympic games, and so on. What is common to them all? -- Don't say: "There must be something common, or they would not be called 'games' "-but look and see whether there is anything common to all. -- For if you look at them you will not see something that is common to all, but similarities, relationships, and a whole series of them at that. To repeat: don't think, but look! (Wittgenstein 1953, 66)

If definitions of religion like the ultimate concern model include too much, it is all too easy to find definitions that egregiously include too little.

When I mention Religion, I mean the Christian Religion; and not only the Christian Religion, but the Protestant Religion; and not only the Protestant Religion, but the Church of England.⁸

Fielding, of course, uses his character, Mr. Thwackum, for satirical purposes, but definitions similar in spirit, if perhaps a little less narrow, have been put forward in all seriousness.

[B]elief in a supreme being remains a necessary characteristic of religion for the purposes of English charity law.⁹

Certainly, religion is wider in scope than the Church of England or belief in a supreme being.

But perhaps we are seeing the fundamental difficulty in defining religion. Religious beliefs and practices vary in dramatic ways across religious traditions and cultures. Dennett introduces a "tentative" definition with the following words of caution.

What is the essence of religion? This question should be considered askance. Even if there is a deep and important affinity between many or even most of the world's religions, there are sure to be variants that share some typical features while lacking one or another "essential" feature. (Dennett 2006, 7)

Although there is no direct reference at this juncture, his analysis seems identical to Wittgenstein's claims about games. Wittgenstein suggests a way of treating "cluster concepts" in his famous analogy with family resemblance.

I can think of no better expression to characterize these similarities than "**family resemblances**"; for the various resemblances between members of a family: build, features, colour of eyes, gait, temperament, etc. etc. overlap and criss-cross in the same way.-And I shall say: 'games' form a family. (Wittgenstein 1953, 32-3)

One of the most widely used strategies in religious studies for defining the entire discipline is to treat the relationship between paradigm cases of religion as forming a family, united by a family resemblance. Stephen Prothero reminds his readers of Smart's seven "dimensions" of religion – ritual, narrative, experiential, institutional, ethical, doctrinal, and material.¹⁰ He immediately retreats, though, to family resemblances.

These family resemblances are just tendencies, however. Just as there are tall people in short families (none of the men in Michael Jordan's family was over six feet tall), there are religions that deny the existence of God and religions that get along just fine without creeds. Something is a religion when it shares enough of this DNA to belong to the family of religions. What makes the members of this family different (and themselves) is how they mix and match these dimensions. ... The world's religions are clearly related, but they are more like second cousins than identical twins. They do not teach the same doctrines. They do not perform the same rituals, and they do not share the same goals. (Prothero 2010, 13)

XI.

In every society, there are

1. Widespread counterfactual and counterintuitive beliefs in supernatural agents (gods, ghosts, goblins, etc.)
2. Hard-to-fake public expressions of costly material commitments to supernatural agents, that is, offering and sacrifice (offerings of goods, property, time, life)
3. Mastering by supernatural agents of people's existential anxieties (death, deception, disease, catastrophe, pain, loneliness, injustice, want, loss)
4. Ritualized, rhythmic sensory coordination of (1), (2), and (3), that is, communion (congregation, intimate fellowship, etc.)

In all societies there is an evolutionary canalization and convergence of (1), (2), (3), and (4) that tends toward "religion"; that is, passionate communal displays of costly commitments to counterintuitive worlds governed by supernatural agents. (Atran and Norenzayan 2004, 713)

Atran and Norenzayan couch their definition of religion as stipulative ('what we shall refer to as "religion"'), but almost immediately make tacit appeal to something like the family resemblance strategy.

These four conditions do not constitute the necessary and sufficient features of “religion.” Rather, they comprise a stipulative (working) framework that delimits a causally interconnected set of pancultural phenomena, which is the object of our study. One may choose to call phenomena that fall under this set of conditions “religion” or not; however, for our purposes the joint satisfaction of all four conditions is what we mean by the term religion. Nevertheless, we offer this working framework as an adequate conceptualization that roughly corresponds to what most scholars consider religion. (Atran and Norenzayan 2004, 713)

As noted above, scholar after scholar, retreats from offering a definition that tries to capture the, to use an antiquated expression, *essence* of religion, to a “working definition,” a stipulative definition, a Wittgensteinian characterization in terms of family resemblance.

Why, it’s fair to ask, don’t Atran and Norenzayan’s conditions constitute necessary and sufficient conditions of religion? Why must Dennett qualify his definition as “tentative”?

Tentatively, I propose to define religions as *social systems whose participants avow belief in a supernatural agent or agents whose approval is sought.* (Dennett 2006, 9)

I concede that my rhetorical question must have many answers – including modesty, deep appreciation of religious diversity, and commitment to the Wittgensteinian paradigm. But I want to suggest that for many, if not all, of those who take refuge in family resemblance definitions, one reason for their analytic caution is the apparent counter-example of Theravada Buddhism.

[W]ithin the wide domain of this very general characteristic religion takes such widely different ways that it cannot be adequately defined but only described. Thus we can say that the worship of a ‘higher unseen power’ is a widespread feature among this family of phenomena. It is however absent from Theravada Buddhism, which nevertheless shares many other prominent characteristics of the family, such as claiming to teach the true nature and meaning of life and to show the way to final liberation from suffering. (Hick 1989, 9)

So, does Theravada Buddhism count as an example of a religion not committed to supernatural agents?

I think there are three powerful reasons for thinking that it does not. Theravada Buddhism doesn't *worship* an unseen power, but it surely encompasses a metaphysics which includes "widespread ... beliefs in supernatural agents." Theravadists see themselves as adhering to "the Way of the Elders ... the Buddhism taught by Gautama himself" (Smith 1991, 121-2). But what could possibly be more fundamental to this perspective than the account of the Buddha's awakening under the Bo Tree?

The records offer as the first event of the night a temptation scene reminiscent of Jesus's on the eve of his ministry. The Evil One, realizing that his antagonist's success was imminent, rushed to the spot to disrupt his concentrations. He attacked first in the form of Karma, the God of Desire, parading voluptuous women with their tempting retinue. When the Buddha-to-be remained unmoved, the Tempter switched his guise to that of Mara, the Lord of Death. His powerful host assailed the aspirant with hurricanes, torrential rains, and showers of flaming rocks. (Smith 1991, 86)

The supernatural, indeed quite purposeful supernatural agents, are at the heart of this story. And it seems *ad hoc* to treat this part of the beginnings of the religion as merely mythological, but the texts authored by the Buddha as fundamental and articulating its true version.

Secondly, Buddhism is often described as a godless religion, but Huston Smith reminds us that to evaluate that claim we need to pause and consider the multiple meanings of the term 'God.'

There is a second meaning of God, however, which ... has been called the Godhead. The idea of personality is not part of this concept, which appears in mystical traditions throughout the world. When the Buddha declared, "There is, O monks, an Unborn, neither become nor created nor formed. ..." he seemed to be speaking in this tradition. (Smith 1991, 114)

Smith cites approvingly the work of Edward Conze and his connection of the central metaphysical concept in all of Buddhism, *nirvana*, with the deeply supernatural notion of the Godhead.

We may conclude with Conze that *nirvana* is not God defined as personal creator, but that it stands sufficiently close to the concept of God as Godhead to warrant the name in that sense. (Smith 1991, 115)

Finally, what counts as a religion? Suppose that every aspect of the Buddha's thought, along with every responsible Theravada monk's beliefs and proclamations, endorsed a purely secular and naturalistic metaphysical view, as they surely do not. Would this even matter? What about everyday Buddhist believers in Theravada cultures like Thailand or Sri Lanka? Don't their beliefs and religious practices have equal claim to be considered in a definition of Buddhism, or religion itself? Buddhism is famous for adapting itself to local cultures and religious practices.

As a child of India, Buddhism inherited Hinduism's absorptive strategy. In India it picked up most of the typical trappings of its religious kin, not least an elaborate pantheon of Buddhas and other spiritual beings with all the supernatural powers of Kali and Shiva. In Tibet it picked up some of the magic of the indigenous shamanism of Bon. And in China it adopted some of the naturalness, spontaneity, and simplicity of Daoism. (Prothero 2010)

From the biological basis I will be using in the next couple of sections, the attitudes of everyday believers are actually more important to defining religion than the specific thoughts of their creators or authoritative spokespersons, since these are the people practicing the religion. And on this score Theravada Buddhists are no counter-example at all to the sorts of suggested definitions proposed above.

XII.

This is a lemon. [Here the instructor displays a specimen.] A thing is a lemon if it resembles this [the specimen] or this [another displayed specimen] or this [a third specimen] in the relevant way. I say the *relevant way*. But to understand better what that way is you must inquire, just to the extent necessary for your purposes, into the *nature* of these three things that I am showing you.¹¹

Consider three different ways of referring to a person or a kind of fruit:

- The United States President who was owner of a major league baseball team
- George W. Bush
- Lemon

What is the relationship between these three bits of language and the things they refer to? In the first case we need to know a lot about the meaning of several words. If you know the meaning of the component phrases, with just a little bit of research you can easily figure out the unique individual who is being talked about. In the case of the proper name, “George W. Bush,” the linguistic story to be told is entirely historical. On July 6 a baby was born in New Haven, Connecticut, and his parents christened him “George Walker Bush.” In the latter half of the twentieth century something of a revolution occurred within analytic philosophy of language as philosophers came to realize that *natural kind* terms – lemon, gold, water, etc – seemed to behave semantically more like proper names than definite descriptions.

If one were to learn to use the term ‘lemon’ through the stylized procedure that David Wiggins suggests as an illustration of this new, causal, or indexical, theory of natural kinds, above, the first key step would be the introduction of the specimens, in exactly the same way one might be introduced to George Bush. Now since lemon is a general term, several different exemplars must be shown, but at a certain point, normal language users *get it*, and become perfectly competent at using this bit of language. For all sorts of purposes, scientific,

philosophical, or lexicographical, we may desire to try to express this *it* that has been gotten in words. We may offer a definition that looks something like this.

The supposed “defining characteristics” of lemons are: yellow color, tart taste, a certain kind of peel, etc. (Putnam 1975, 140)

Putnam’s appeal to a “supposed” definition tips us off immediately, but the key to appreciating the new theory of reference is to see how far this definition diverges from the philosopher’s idealization of a definition.

Consider the following definition of a (Euclidian) triangle.

The defining characteristics of a triangle are: being a plane figure, being a closed figure, being composed of three straight lines, having interior angles equaling exactly 180° .

Here, each of the characteristics is logically necessary – something cannot be a triangle if it has any more or less than three straight lines. A proper collection of the characteristics can be logically sufficient for being a triangle – being a plane, closed figure composed of three straight lines guarantees being a triangle (as does being a plane closed figure with interior angles of 180°). In our definition of lemons, however, the characteristics fail to be necessary (“[a] green lemon is still a lemon—even if, owing to some abnormality, it *never* turns yellow” (Putnam 1975)). The characteristics themselves are vague (“[t]here is ... a problem with ‘tart taste’—shouldn’t it be *lemon* taste?” (Putnam 1975)). And the list itself is vague, incomplete, and fails to be logically sufficient (“[t]here is, of course, a problem with ‘etc.’” (Putnam 1975)).

Just because the catalogue of lemon characteristics fails to be a philosophically ideal definition does not mean that it is of no practical use. There was a time not that long ago when this list of contingent, empirical features of *normal* lemons was the best that could be produced by philosophers, lexicographers, and scientists. Even in those days, however, there was a

shared faith that there was some sort of underlying essence to lemonhood, and it was the task of natural science to discover it.

If I describe something as a *lemon*, or an *acid*, I indicate that it is likely to have certain characteristics (yellow peel, or sour taste in dilute water solution, as the case may be); but I also indicate that the presence of those characteristics, if they are present, is likely to be accounted for by some “essential nature” which the thing shares with other members of the natural kind. What the essential nature is not a matter of language analysis but of scientific theory construction: today we would say it was chromosome structure in the case of lemons, and being a proton-donor in the case of acids. (Putnam 1975)

XIII.

Structural theories in the natural sciences provide definitions of natural kinds that are plausibly considered as revealing their essences. Familiar examples are the claim that water is H₂O and the claim that gold is the element with atomic number 79. However, there is no reason to suppose that religion is a natural kind, for religions are social products rather than things we discover in nature. (Quinn 2005, 400-1)

Peter B. Clark and Peter Byrne are two scholars who take seriously, though remain skeptical of, the hypothesis that religion is a natural kind that could be defined through scientific theory construction.

If the theorist of religion is to use this non-metaphysical notion of an essence in his search for an explanatory unity in the phenomena of religion, he needs also to suppose that some of the logic of natural kind terms applies to ‘religion.’ It is part of our notion of a natural kind that its various instances exhibit a real unity despite their apparent differences. We should expect the properties of such instances to mutually illuminate one another and for there to be no end to the range of similarities discoverable amongst the instances of the kind. ... The prima facie problems in seeing the class of religions as united by an underlying essence lie in two areas: (a) disanalogies between ‘religion’ and scientifically definable natural kind terms; (b) difficulties in finding candidate essential properties which can be present throughout the class despite many outward differences between its members.¹²

I will attend to the problem of “candidate essential properties” in the final section. But it is crucial to my argument directly confront the apparent disanalogies between religion and natural kinds like lemons, water, or gold.

Before the surprising development of a cognitive neuroscience of religion, I think most scholars would have seen huge, perhaps unbridgeable, differences between religion and the sorts of things for which the natural sciences have discovered empirical essences. Most would have agreed with Quinn in the epigraph to this section – “religions are social products rather than things we discover in nature.” As we have seen, however, both the by-product theorists and the adaptationists would disagree that religions are *entirely* social products. However much culture and social construction contribute to the modern institutions we recognize as religious, if there is something in human nature – something neural – that unites all religious behavior, we have the basic building block for a natural kind definition.

IX.

The explanation for religious beliefs and behaviors is to be found in the way all human minds work. I really mean all human minds, not the minds of religious people or some of them. I am talking about human minds, because what matters here are properties of minds that are found in all members of our species with normal brains. (Boyer 2001, 2)

If we begin by treating religion, or religious behavior, as a natural kind, then I believe we are in a strong position to offer the basics of an empirically based definition that yields not just factual, but also semantic, insight. The first step will be to specify the “defining characteristics” that united the various exemplars we had already identified as religions. Based on centuries of anthropological, historical, and theological research, I suggest we find three broad categories of

features that unite and define religion: a metaphysical dimension, a normative dimension, and a social dimension.

Religion rejects a purely naturalistic, material model of *reality*. Yes, of course, there are the atoms, molecules, cells and neurons that the natural sciences so excel in describing and sometimes controlling. But religion insists that there is more than just this physical stuff – there is something *meta*-physical, something *super*-natural. The search for a general name for this non-physical aspect of reality has yielded many interesting candidates – the numinous, (Otto 1958) the sacred, (Elaide 1996) the transcendent, and the divine. Once we have rejected the potential counter-examples of Theravada Buddhism, and perhaps Confucianism, we have our first plausible candidate for a universal characteristic of all religions.

Superimposed on this supernatural metaphysics is the concept of agency. The numinous does not passively coexist with physical reality, but rather causally interacts with it. In most, if not all, religions, this causal interaction is in some sense purposeful. Things don't just happen, they are done – creation, answering prayer, administering divine justice and punishment. A metaphysical system composed of non-physical, supernatural, agents is simply a system of gods. And, if this additional characteristic is truly universal in religion, we can appreciate Dennett's one-liner: "the idea of a religion without *God* or *gods* is like a vertebrate without a backbone" (Dennett 2006, 9).

Turning now to the normative characteristics, I suggest that we find two which are overarching. The numinous itself is of great normative importance. It is something to be held in awe, something to be worshiped. In most religions it is not just of importance, but of more importance than the physical, natural, and biological world. Further, perhaps because of its

intrinsic normative value, the numinous gives normative direction to human individuals and societies.

Religion, above all, embodies the moral rules that members of a community observe toward one another. It sustains the quality of the social fabric, and did so alone in early societies that had not developed civil authorities. It binds people together for collective action, through public rituals that evoke emotional commitment to a common cause. (Wade 2009, 2)

The final general characteristic of religion is that it is inherently social. One can imagine the philosopher, or the poet, who sincerely believes in a metaphysics of supernatural agents, of great intrinsic normative significance, and who issues moral rules that guide the philosopher's or poet's life. If this is a purely private intellectual endeavor, I suggest we do not yet have a true religion.

[H]owever strongly religion may seem to grow out of people's personal beliefs, the practice of religion is heavily social. It is because of their personal beliefs that people desire to worship together with others of the same faith. People may pray alone, but religious services and rituals are communal. A religion belongs to a community, and shapes members' social behavior. (Wade 2009, 9)

The social aspect of religion, of course, plays a central role in the evolutionary accounts we have been examining. For the adaptationist like Wilson, the ability to bring societies together is precisely the good trick that allowed for a religion instinct to evolve in the first place. For the spandrel theorists like Boyer, Atran, and Bloom, the story is only one step less direct. Our biology makes us hyper-active agency detectors, and natural born dualists. The religion meme is a by-product that takes hold in this cognitive environment. But now we must once again explain the competitive success of this meme. Just like before the memetic good trick is holding society together. All of this, of course, was articulated in a distinctly non-biological context by Durkheim.

Religion is first and foremost a system of ideas by means of which individuals imagine the society of which they are members and the obscure yet intimate relations they have with it.¹³

Recall the lessons from the semantics of lemons. None of the characteristics above are offered as logically necessary conditions analyzed out of the meaning of the term “religion.” We are engaged in an empirical enterprise. It is heartening to think that these aspects of religion may be truly universal, but even if they are not (remember Putnam above: “[a] green lemon is still a lemon—even if, owing to some abnormality, it *never* turns yellow”), they are still prominent enough in almost every religion to be included. But to count as a genuinely natural kind, there must be some underlying scientific reason that we find these characteristics so reliably collected together in all religions. People could, for all sorts of reasons, articulate the “defining characteristics” of water, gold, and lemons. But it was only with the advent of atomic chemistry and genetics that we were in a position to say anything authoritative about why we found these characteristics bundled together in samples of water, gold, and lemons. We suddenly find ourselves in a strongly analogous position with respect to religion. Given the truth of the hypothesis that all human beings are genetically predisposed to see aspects of their worlds in terms of supernatural agents, predisposed to associate great normative importance to them, and predisposed to desire, even need, to join together in communal celebrations of all of this, it is hardly surprising that we see this always, or almost always, manifested in those behaviors, personal and public, that we have already recognized as religious.¹⁴

Works Cited

- Atran, Scott. 2002. *In Gods We Trust: The Evolutionary Landscape of Religion*. Oxford: Oxford University Press.
- Atran, Scot and Norenzayan, Ara. 2004. "Religion's evolutionary landscape: Counterintuition, commitment, compassion, communion" *Behavioral and Brain Sciences* 27.
- Dawkins, Richard. 2006. *The God Delusion*. Boston: Houghton Mifflin.
- Dennett, Daniel. 1995. *Darwin's Dangerous Idea*. New York: Simon & Schuster.
- Dennett, Daniel. 2006. *Breaking the Spell: Religion as a Natural Phenomenon*. New York: Viking.
- Eigen, Manfred. 1992. *Steps Toward Life*. Quoted in, (Dennett 2006, 348).
- Eliade, Mircea. 1996. *Patterns in Comparative Religion*. Lincoln: University of Nebraska Press.
- Ereshefsky, Marc. 2001. *The Poverty of the Linnaean Hierarchy*. Cambridge, UK: Cambridge University Press.
- Fodor, Jerry. 1980. *The Language of Thought*. Cambridge, MA: Harvard University Press.
- Geertz, Clifford. 2000. *Available Light*. Princeton: Princeton University Press.
- Gould, Steven Jay and Lewontin, R. C. 1979. "The Spandrels of San Marco and the Panglossian Paradigm: A Critique Of The Adaptationist Programme." *Proceedings Of The Royal Society of London, Series B, Vol. 205, No. 1161*.
- Gribbin, John. 2002. *The Scientists*. New York: Random House.
- Harris, Marvin. 1990. *Our Kind*. New York: Harper Perennial.
- Harris, Sam. 2004. *The End of Faith*. New York: Norton.
- Henig, Robin Marantz. 2007. "Darwin's God." *The New York Times*, March 4, 2007.
- Hick, John. 1989. *An Interpretation of Religion: Human Responses to the Transcendent*. New Haven: Yale University Press.
- Hick, John. 1993. *God and the Universe of Faiths*. Oxford: Oneworld.
- Hopkins, E. Washburn. 1923. *Origin and Evolution of Religion*. New Haven: Yale University Press.

- Otto, Rudolf. 1958. *The Idea of the Holy*. New York: Oxford University Press).
- Plantinga, Alvin. 1995. "Pluralism: A Defense of Religious Exclusivism." In *The Philosophical Challenge of Religious Pluralism*, ed. Philip L. Quinn and Kevin Meeker. Oxford: Oxford University Press.
- Prothero, Stephen. 2010. *God is not One*. New York: Harper One.
- Putnam, Hilary. 1975. "Is Semantics Possible?" In *Mind, Language and Reality: Philosophical Papers, Volume 2*. Cambridge, UK: Cambridge University Press.
- Quinn, Philip L. 2005. "Religious Diversity: Familiar Problems, Novel Opportunities." In William J. Wainwright, editor, *The Oxford Handbook of Philosophy of Religion* (New York: Oxford University Press).
- Schweder, Richard. 2005. "Cliff Notes: The Pluralisms of Clifford Geertz." In *Clifford Geertz by His Colleagues*, ed. Richard A. Shweder and Byron Good. Chicago: University of Chicago Press.
- Smith, Huston. 1991. *The World's Religions*. San Francisco: Harper San Francisco.
- Tillick, Paul. 1940. *The Shaking of the Foundations*. New York: Charles Scribner's Sons.)
- Tremlin, Tood. 2006. *Minds and Gods*. Oxford: Oxford University Press.
- Wade, Nicholas. 2006. "Study Detects Recent Instance of Human Evolution." *New York Times*, December 10, 2006.
- Wade, Nicholas. 2009. *The Faith Instinct*. New York: The Penguin Press.
- Wilson, David Sloan. 2002. *Darwin's Cathedral: Evolution, Religion, and the Nature of Society* (Chicago: The University of Chicago Press).
- Wittgenstein, Ludwig. 1953. *Philosophical Investigations*. New York: Prentice Hall.
- Wright, Larry. 1982. "Induction and Explanation." *Philosophical Inquiry*.

ENDNOTES

¹ A good account of the history of electricity is in (Gribbin, 2002). A philosophically rich examination of the species problem in biology is found in (Ereshefsky, 2001).

² Quoted in (Wade, 2009).

³ Jean Bodin, quoted in (Plantinga 2000, 173).

⁴ Complicated structures like eyes and opposable thumbs, of course, have much more complicated biochemical underpinnings than one particular bit of DNA.

⁵ See (Atran 2002, 13-5).

⁶ See <http://www.youtube.com/watch?v=sZBKer6PMtM>

⁷ Tillich, Paul. "Religion as a Dimension in Man's Spiritual Life," in Giles Gunn editor, *New World Metaphysics: Readings on the Religious Meaning of the American Experience* (New York: Oxford University Press, 1981), p. 415.

⁸ Henry Fielding, Tom Jones 83 (Sheridan Baker ed., Norton 1995) (1749). Quoted in T. Jeremy Gunn, "The Complexity of Religion and the Definition of "Religion" in International Law," *Harvard Human Rights Journal*, Vol. 16, Spring 2003, p. 189.

⁹ Decision of the Charity Commissioners for England and Wales, *Application for Registration as a Charity by the Church of Scientology (England and Wales)* (17 November 1999), 21, at <http://www.charity-commission.gov.uk/registration/pdfs/cosfulldoc.pdf>. Quoted in Gunn, *op. cit.*, p. 189.

¹⁰ Ninian Smart, *Dimensions of the Sacred* (Berkeley: University of California Press, 1996). Cited in (Prothero 2010, 13).

¹¹ David Wiggins, "Putnam's Doctrine of Natural Kind Words and Frege's Doctrine of Sense, Reference and Extension: Can They Cohere?" in A. W. Moore, editor, *Meaning and Reference* (Oxford: Oxford University Press, 1993), p. 195.

¹² Peter B. Clarke and Peter Byrne, *Religion Defined and Explained* (New York: St. Martin's Press, 1993), pp. 18 & 20. I want to take this occasion to thank Professor Byrne for some very helpful and generous personal correspondence that allowed me to see the necessity of this entire section.

¹³ Durkheim cited in (Wade 2009, 10).

¹⁴ A very sincere thank you to my colleague and friend, Professor David Komito, for invaluable help with this article.