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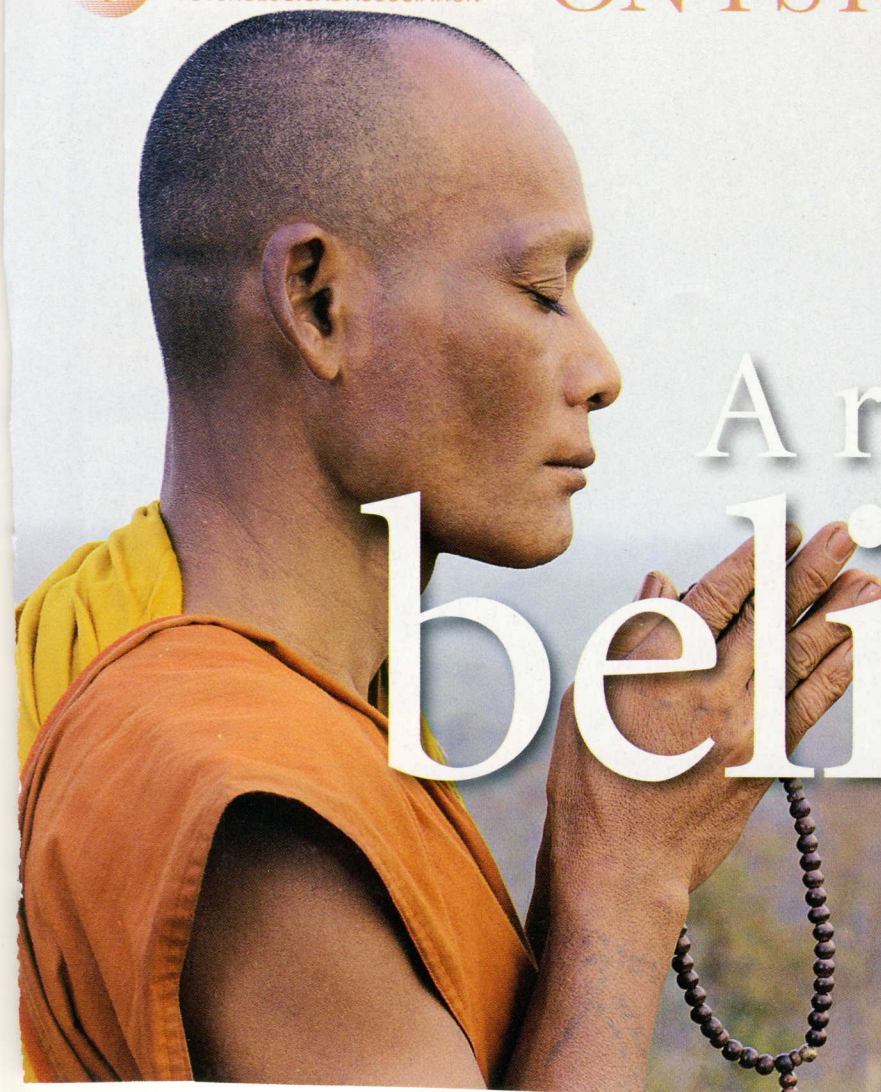
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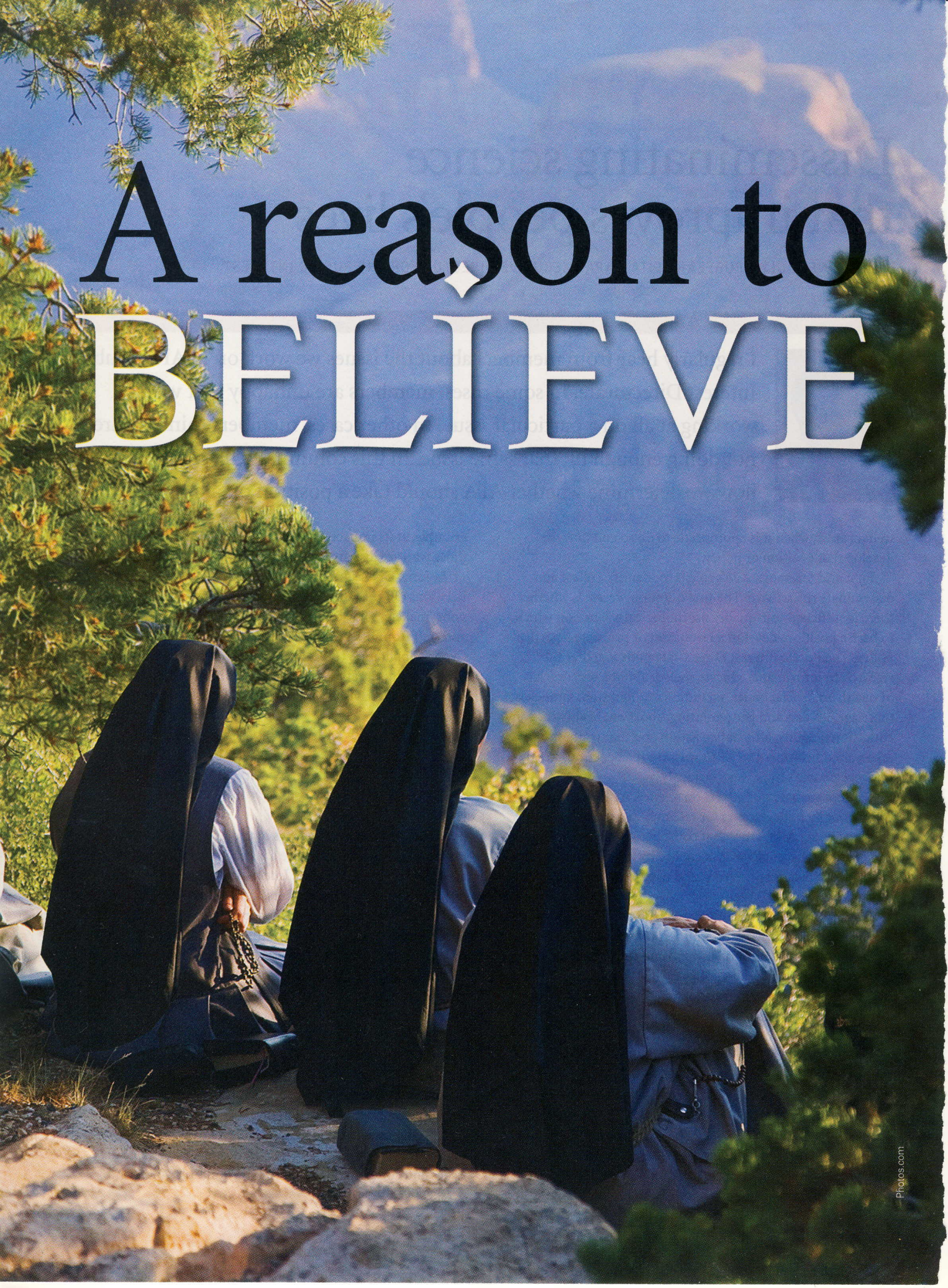
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A reason to

believe



A reason to BELIEVE



Religion may fill the human need for finding meaning, sparing us from existential angst while also supporting social organization, researchers say.

BY BETH AZAR

Harking back to Sigmund Freud, some psychologists have characterized religious beliefs as pathological, seeing religion as a malignant social force that encourages irrational thoughts and ritualistic behaviors.

Of course, psychologists' doubts — and those of countless others throughout history — haven't curtailed religion's powerful hold on humans. Religion has survived and thrived for more than 100,000 years. It exists in every culture, with more than 85 percent of the world's population embracing some sort of religious belief.

Researchers who study the psychology and neuroscience of religion are helping to explain why such beliefs are so enduring. They're finding that religion may, in fact, be a byproduct of the way our brains work, growing from cognitive tendencies to seek order from chaos, to anthropomorphize our environment and to believe the world around us was created for our use.

Religion has survived, they surmise, because it helped us form increasingly larger social groups, held together by common beliefs.

"If we're on the right track with this byproduct idea — and the findings are really getting strong — it's hard to then build the case that religion is a pathology," says psychologist Justin Barrett, PhD, director of the cognition, religion and theology project in the Centre for Anthropology and Mind at Oxford University.

Predisposed to believe

There's no one cognitive tendency that undergirds all our religious beliefs, says Barrett. "It's really your basic, garden-

variety cognitions that provide the impetus for religious beliefs," he says.

A common thread to those cognitions is that they lead us to see the world as a place with an intentional design, created by someone or something. Young children, for example, tend to believe that even trivial aspects of the natural world were created with purpose, according to a series of studies by Boston University psychologist Deborah Keleman, PhD. If you ask children why a group of rocks are pointy, for example, they say something like, "It's so that animals won't sit on them and break them." If you ask them why rivers exist, they say it's so we can go fishing.

Adults also tend to search for meaning, particularly during times of uncertainty, research suggests. A 2008 study in *Science* (Vol. 322, No. 5898) by Jennifer Whitson, PhD, and Adam Galinsky, PhD, found that people were more likely to see patterns in a random display of dots if the researchers first primed them to feel that the participants had no control. This finding suggests that people are primed to see signs and patterns in the world around them, the researchers conclude.

People also have a bias for believing in the supernatural, says Barrett. In his work, he finds that children as young as age 3 naturally attribute supernatural abilities and immortality to "God," even if they've never been taught about God, and they tell elaborate stories about their lives before they were born, what Barrett calls "pre-life."

"What we're showing is that our basic cognitive equipment biases us toward certain kinds of thinking and leads to thinking about a pre-life, an afterlife, gods, invisible beings that are doing

things — themes common to most of the world's religions," says Barrett.

That basic equipment includes a memory system that appears to be exceptionally good at remembering the kinds of stories found in many religious texts. In particular, research finds that we most easily recall stories with some, but not too many, counterintuitive or "supernatural" elements. In one study, published in 2006 in *Cognitive Science* (Vol. 30, No. 3), Scott Atran, PhD, and Ara Norenzayan, PhD, tested people's recall of concepts that ranged from intuitive — a grazing cow — to just slightly counterintuitive — a cursing frog — to extremely counterintuitive — a squealing flowering brick. Although people more easily remembered the intuitive stories an hour after reading them, a week later, they were more likely to remember the slightly counterintuitive stories.

This finding held up in both American college students and Maya villagers from the Mexican Yucatan, suggesting that stories with a few minimally counterintuitive elements, such as those found in many religious stories, are more easily remembered and, presumably, more readily transmitted from person to person, says Norenzayan, a psychologist at the University of British Columbia.

That said, most researchers don't believe that the cognitive tendencies that bias us toward religious belief evolved specifically for thinking about religion. Rather, they likely served other adaptive purposes. For example, because people are quick to believe that someone or something is behind even the most benign experiences, they may perceive the sound of the wind rustling leaves as a potential predator. In evolutionary terms, says Atran, it was probably better for us to mistakenly assume that the wind was a lion than to ignore the rustling and risk death.

But this tendency also set us up to believe in an omnipresent God-like concept. Taken together, it's easy to see how these cognitive tendencies could allow our minds to create religions built on the idea of supernatural beings that watch over our lives, says Atran, director of research at the Centre National de la Recherche Scientifique in Paris.

Such research also supports the notion that religious thought is in many ways an unavoidable byproduct of the way our minds work. Psychologist Thomas Plante, PhD, hopes that view will help people see themselves as "more whole."

“This work reiterates that we are whole people; the biological, psychological, social, cultural and spiritual are all connected.”

THOMAS PLANTE
President of APA's Div. 36

“We've had this long history of believing that the things of the spirit are in one camp and that science and technology are in another camp,” says Plante, professor and director of the Spirituality and Health Institute at Santa Clara University and president of APA's Div. 36 (Psychology of Religion). “If anything, this work reiterates that we are whole people; the biological, psychological, social, cultural and spiritual are all connected.”

Neural underpinnings

Neuroscience research supports the idea that the brain is primed to believe, says Jordan Grafman, PhD, director of the cognitive

neuroscience section at the National Institute of Neurological Disorders and Stroke. This tendency, he says, is spread throughout the brain, and probably arose from neural circuits developed for other uses.

“The idea that got a lot of attention several years ago that there's a ‘God spot’ in the brain where religious thoughts and feelings arise has largely been rejected,” says Grafman, who will be moving to the Kessler Foundation in West Orange, N.J., in January to lead a traumatic brain injury research laboratory.

In 2009, Grafman published an fMRI study showing that religious thoughts activate the area of the brain involved in deciphering other people's emotions and intentions — the ability known as theory of mind. In the study of 40 people, published in the *Proceedings of the National Academy of Sciences* (Vol. 106, No. 12), Grafman and his colleagues found that when they heard phrases such as “God's will guides my acts” and “God protects one's life,” areas of the brain involved in theory of mind lit up. In a study published in 2009 in *Social Cognitive Affective Neuroscience* (Vol. 4, No. 2), a Danish team saw the same brain areas activate when religious participants prayed.

These results suggest that when people think about God, it's similar to thinking about any special authority figure, such as one's mother or father, says Grafman. In addition, he says, contemplation is not limited to religious thought, although certain traditions like prayer or meditation may require selective kinds of thinking processes. In general, he believes, the brain uses the same circuits to think about and experience religion as it does to think about and handle any other thoughts or beliefs.

What may make religion different from mundane thoughts about one's parents are contemplative traditions, such as meditation and prayer, which have the potential to change how the brain is wired among regular practitioners, says University of Wisconsin psychologist Richard Davidson, PhD. His work using both fMRI and EEG to measure brain activity of long-term Buddhist meditation practitioners during meditation shows that they have a stronger and better organized attention system than people who are just learning how to meditate. In essence, meditation — and perhaps any contemplative spiritual practice — enhances attention and turns off the areas of the brain that focus on the self.



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“Meditation is a family of mental exercises that change the circuits in the brain involved in regulation of emotion and attention,” he says.

Even religion without a contemplative element may change certain brain circuits, according to research by University of Toronto psychologist Michael Inzlicht, PhD. His work focuses on a brain wave generated by the anterior cingulate cortex, called “error-related negativity” (ERN), which spikes when people make mistakes.

“It’s our cortical alarm bell, an ‘uh-oh’ response that is preconscious and emotional,” says Inzlicht. “When we make an error, it’s arousing, causing slight anxiety.”

In a study published last year in *Psychological Science* (Vol. 20, No. 3), he measured this “uh-oh” response in people who performed a standard color-naming Stroop task. Even though all of the 28 study participants made mistakes, the ERN firing was less strong in people with more religious zeal and greater belief in God. “They’re calmer and more graceful under pressure,” says Inzlicht.

In a second set of studies, published in August in *Psychological Science* (Vol. 21, No. 8), Inzlicht and his colleagues tested whether people who are born with a lower ERN response gravitate toward religion or whether religion actually lowers this “uh-oh” response. They asked participants to write about religion or about something that makes them happy and found that those who wrote about religion had a lower ERN response, suggesting that religion dampens this anxious response. Inzlicht

believes religion’s effect may come from its ability to make people calmer overall by “explaining” phenomena we don’t understand.

“This difference occurs in only a few hundredths of a second, but we propose that a lifetime of having less intense reactions can lead to a lifetime of being calmer,” says Inzlicht.

These findings mesh with a large body of research and clinical reports that religious people are less prone to depression and anxiety, says Plante, editor of the book “Contemplative Practices in Action: Spirituality, Meditation, and Health” (APA, 2010). “Adaptive spiritual practices can be a foil to anxiety and depression,” Plante says.

Having spiritual beliefs might also lead to enjoying a longer, healthier life. A large body of research finds that religious people live longer, are less prone to depression, are less likely to abuse alcohol and drugs, and even go to the dentist more often. Inzlicht’s research might provide a partial explanation for these findings, says University of Miami psychologist Michael McCullough, PhD.

Pro-sociality

Religion may serve another key purpose — it allows people to live in large, cooperative societies, says Norenzayan. In fact, the use of religion as a social tool may largely explain its staying power and cross-cultural ubiquity.

“Religion is one of the big ways that human societies have hit on as a solution to induce unrelated individuals to be nice to

each other," says Norenzayan.

In particular, religion encourages people to be more charitable by promoting belief in a supernatural agent, according to his research. In a 2007 study published in *Psychological Science* (Vol. 18, No. 9), Norenzayan and Azim Shariff primed participants with thoughts of God by having them unscramble sentences containing words such as "divine," "spirit" and "God." They asked another group of participants to unscramble religiously neutral words. The participants then decided how much of \$10 to keep and how much to give to a stranger. The researchers found that the participants who were primed with religious thoughts gave an average of \$2.38 more than the other participants.

University of British Columbia researcher Joseph Henrich, PhD, found cross-cultural support for this finding in a study published in March in *Science* (Vol. 327, No. 5972). He showed that, across 15 diverse societies, people who participated in a world religion were more fair toward strangers when playing economic games than people who were not religious.

"Religion, in a sense, outsources social monitoring to a supernatural agent," says Norenzayan. "If you believe in a monitoring God, even if no one is watching you, you still have to be pro-social because God is watching you."

The idea that religion evolved to benefit larger social

communities also meshes with theoretical work by University of Virginia psychologist Jonathan Haidt, PhD, and his former graduate student Jesse Graham, PhD, now an assistant professor at the University of Southern California. In an article published in February in *Personality and Social Psychology Review* (Vol. 14, No. 1), they suggest that religion co-evolved with morality as a way to bind people into large moral communities. Graham and Haidt argue that, through stories and rituals, religions have built on five basic moral foundations: Do no harm, play fairly, be loyal to your group, respect authority and live purely.

Early religions used rituals — such as restricting certain foods such as pork and wearing clothing to denote modesty — to publicly demonstrate these moral concerns. Those rituals then helped unite people and allowed them to live together cooperatively, says Graham. Today, religions continue that tradition.

Of course, while religion brings some people together, it continues to cause deep divisions, says Atran, who has worked as a negotiator in several hotspots around the world, including Israel. "The problem is, the more you look inward toward your religious group and its claims of virtue, the less you look outward and the more distrustful you are of others," he says.

That distrust causes much of the world's strife and violence and is one of the reasons the "new atheists," including British evolutionary biologist Richard Dawkins, PhD, and neuroscientist Sam Harris, PhD, want to see religion disappear. But that will be difficult if not impossible if religion is a byproduct of the way our brains work, as much of the recent research suggests, says Atran. What could work, says Norenzayan, is to replace religion with secular communities built on a common moral foundation. He suggests that Denmark's society is successfully doing this with its large welfare state, its national ethic of hard work and its strong attachment to political freedom and individualism. But such societies will still need many of the components of religion, including a belief that we're all part of the same moral community and, therefore, should make sacrifices that benefit the greater good.

To get there, researchers need to continue to fine-tune their understanding of religion, says Barrett. "As the research matures and we bring in other areas of psychology, I think we'll have a better window into the nature of religion and where it might be going." ■

Beth Azar is a writer in Portland, Ore.

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