Big gods demand costly displays of faith, like Abraham's willingness to sacrifice his son Isaac. In Rembrandt's painting, God sends an angel to stay the knife.

BIRTH OF THE MORALIZING GODS

A new theory aims to explain the success of world religions—but testing it remains a challenge

By **Lizzie Wade**

An ancient Egyptian spent her whole life preparing for the moment when her heart would be weighed. After death, she was escorted before a divine scale. In one pan rested an ostrich feather belonging to Maat, the goddess of social order. The other pan held her heart. The deceased had been buried with a list of her virtues: "I have not uttered lies." "I have not slain men and women." "I have not stopped the flow of water [of the Nile.]" Any sins would weigh down her heart. When the scale settled, her fate would be clear: If her heart weighed no more than Maat's feather, she was escorted to paradise. If her heart was too heavy, the crocodile demon Amemet reared up and devoured it, obliterating her soul.

Although much of Egyptian cosmology is alien today, some is strikingly familiar: The gods of today's major religions are also moralizing gods, who encourage virtue and punish selfish and cruel people after death. But for most of human history, moralizing gods have been the exception. If today's hunter-gatherers are any guide, for thousands of years our ancestors conceived of deities as utterly indifferent to the human realm, and to whether we behaved well or badly.

To crack the mystery of why and how people around the world came to believe in moralizing gods, researchers are using a novel tool in religious studies: the scientific method. By combining laboratory experiments, cross-cultural fieldwork, and analysis of the historical record, an interdisciplinary team has put forward a hypothesis that has

the small community of researchers who study the evolution of religion abuzz. A culture like ancient Egypt didn't just stumble on the idea of moralizing gods, says psychologist Ara Norenzayan of the University of British Columbia (UBC), Vancouver, in Canada, who synthesized the new idea in his 2013 book *Big Gods: How Religion Transformed Cooperation and Conflict*. Instead, belief in those judgmental deities, or "big gods," was key to the cooperation needed to build and sustain Egyptians' large, complex society.

In this view, without supernatural enforcement of cooperative, "moral" behavior, ancient Egypt—as well as nearly every other large-scale society in history—wouldn't have been able to get off the ground. All-knowing big gods are "crazily effective" at enforcing social norms, says Norenzayan's collaborator Edward Slingerland, a historian at UBC Vancouver. "Not only can they see you everywhere you are, but they can actually look inside your mind." And once big gods and big societies existed, the moralizing gods helped religions as dissimilar as Islam and Mormonism spread by making groups of the faithful more cooperative, and therefore more successful.

It's a sweeping theory, grander in scale than much of the scholarship by religious studies experts, who usually examine one tradition at a time. "They've done a great service by bringing together a lot of important findings in the field," says Richard Sosis, a human behavioral ecologist at the University of Connecticut, Storrs. Now, they're embarking on new experiments and analysis to test

it—a challenging task given the scope of the theory. "It's easy to say" that moralizing religions spread through cultural evolution, says Dominic Johnson, an evolutionary biologist at the University of Oxford in the United Kingdom who studies religion and cooperation. "But it's quite hard to demonstrate."

WHEN NORENZAYAN was growing up in Lebanon in the 1970s and 1980s, "it was very hard to miss religion," he remembers. Faith was the defining fact of people's lives, and it fueled the sectarian war that consumed the country. After moving to the United States for a Ph.D., Norenzayan became fascinated with scientific efforts to explain belief, many of them rooted in cognitive sciences. A series of studies had shown that both children and adults eagerly ascribe humanlike intentions and actions to inanimate objects like rocks and the sun. For example, British and American children repeatedly told scientists that rocks are sharp so animals won't sit on them, rather than because they are made up of smaller pieces of material (*Science*, 6 November 2009, p. 784). Such studies contributed to a growing scientific consensus that belief in the supernatural is an evolutionary byproduct of the quirks of the human brain, piggybacking on abilities that evolved for different purposes.

But Norenzayan was not satisfied. The byproduct model doesn't explain the particular nature of religions in complex societies—the presence of moralizing gods who prescribe human behavior. Nor does it

explain why a handful of those faiths have proved so successful.

In an effort to answer these questions, Norenzayan began making forays into the psychology of religion. In one study, published in 2007 in *Psychological Science*, he and a colleague gave $10 to participants, who could then decide how much to give to a stranger and how much to keep for themselves. When primed with religious words, participants gave away an average of $4.22, whereas a control group gave away only $1.84.

A few years later, human evolutionary biologist Joseph Henrich (then at UBC Vancouver, now at Harvard University) and his colleagues asked people in 15 societies, ranging from tribal farmers in Papua New Guinea to wageworkers in Missouri, to play a similar economic game. The researchers found that across these cultures, people who participated in a moralizing world religion, particularly Christianity and Islam, gave as much as 10% more to strangers than did unbelievers or practitioners of animism. Their results were published in *Science* in 2010.

Norenzayan thinks this connection between moralizing deities and "prosocial" behavior—curbing self-interest for the good of others—could help explain how religion evolved. In small-scale societies, prosocial behavior does not depend on religion. The Hadza, a group of African hunter-gatherers, do not believe in an afterlife, for example, and their gods of the sun and moon are indif-

When Kenya's Orma people converted to Islam, they gained advantageous economic ties and new customs like this Muslim ceremony.

ferent to the paltry actions of people. Yet the Hadza are very cooperative when it comes to hunting and daily life. They don't need a supernatural force to encourage this, because everyone knows everyone else in their small bands. If you steal or lie, everyone will find out—and they might not want to cooperate with you anymore, Norenzayan says. The danger of a damaged reputation keeps people living up to the community's standards.

As societies grow larger, such intensive social monitoring becomes impossible. So there's nothing stopping you from taking advantage of the work and goodwill of others and giving nothing in return. Reneging on a payment or shirking a shared responsibility have no consequences if you'll never see the injured party again and state institutions like police forces haven't been invented yet. But if everyone did that, nascent large-scale societies would collapse. Economists call this

paradox the free rider problem. How did the earliest large-scale societies overcome it?

In some societies, belief in a watchful, punishing god or gods could have been the key, Norenzayan believes. As he wrote in *Big Gods*, "Watched people are nice people." Belief in karma—which Norenzayan calls "supernatural punishment in action"—could have had a similar psychological effect in the absence of actual gods, a proposition his colleagues are investigating in Asia.

History and archaeology offer hints that religion really did shape the earliest complex societies. Conventional wisdom says that the key to settling down in big groups was agriculture. But "agriculture itself is a wildly improbable cooperative activity," notes Slingerland, who studies ancient China. "Especially in places where you can't get agriculture off the ground without large-scale irrigation or water control projects, the cooperation problem has to get solved before you can even get the agriculture ramped up." That's where religion came in, he and Norenzayan think.

A case in point, they say, is Göbekli Tepe, an archaeological site in southeastern Turkey. Huge stone obelisks carved with evocative half-human, half-animal figures dot the 11,500-year-old site, which the late Klaus Schmidt of the German Archaeological Institute, who excavated there, called "the first manmade holy place" (*Science*, 18 January 2008, p. 278). Moving and decorating the

As societies grow bigger, so do their gods

Small tribes worship spirits that pay little heed to human behavior, whereas moralizing "big" gods may help societies scale up to full-blown states.
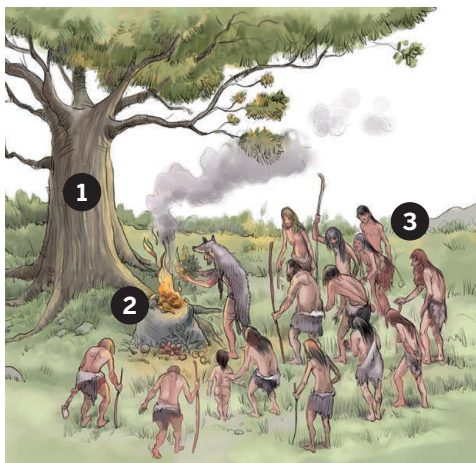
The gods of small-scale societies, such as nature spirits (**1**), may demand offerings (**2**) or enforce taboos. But villagers watch each other (**3**) and enforce social norms without any supernatural help.
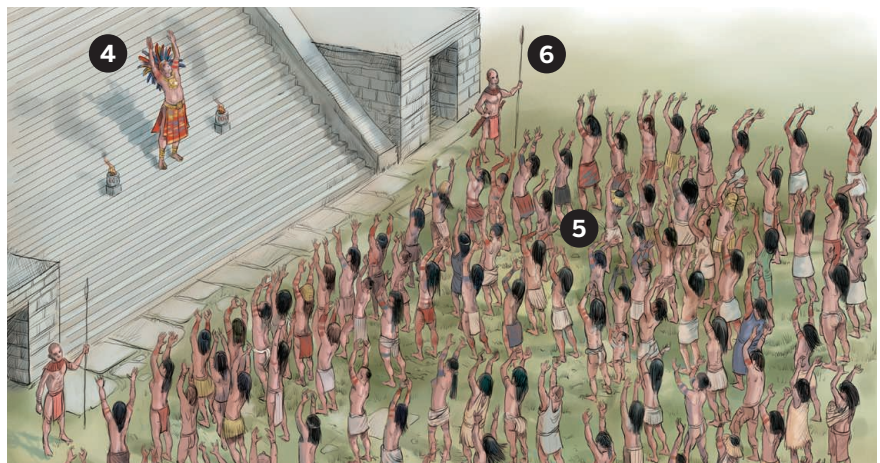
Big gods help bring big societies together. Omniscient, moralizing deities (**4**) keep a close eye on human behavior and punish those who are selfish or cruel. Rituals (**5**) and other costly displays of faith prove who is a trustworthy true believer. Increased cooperation helps societies grow into complex states with other prosocial institutions, like police forces (**6**).

great obelisks must have required a huge community effort. But signs of agriculture don't appear nearby until 500 years later, meaning that the builders of Göbekli Tepe were likely hunter-gatherers who had come together to practice shared religious beliefs, Slingerland says. As Schmidt has said, "First came the temple, then the city."

The big gods hypothesis also helps explain why a handful of religions spread widely: They offer new adherents expanded opportunities for economic and social cooperation. The Orma herders of East Africa, for example, maintained their animist beliefs for centuries while living in close contact with Muslim friends and business partners. Then, in the latter half of the 19th century, war ruined the Orma's local institutions and weakened their control of the regional ivory and livestock trades. Within a few decades, the entire Orma society had converted to Islam. And once they did, they were inducted into a worldwide network of long-distance traders, bound together by the trust that a shared faith in a moralizing god provides.

The Orma had to do more than profess their newfound faith. They had to show they meant it by giving up pork, eschewing alcohol, reforming their rules about polygamy, and praying five times a day. These "costly displays of faith" are "markers that you're a true believer in Islam" and therefore are likely to keep your word, especially to your fellow Muslims, Henrich explains. Whether they take the form of generous donations to the church or painful body modifications like circumcision or scarification, these displays prove to others that you are truly committed to your religion and thus can function as a shorthand for trustworthiness.

After their conversion, the Orma "missed their days of drunken bashes," an aspect of many earlier local rituals, says economist Jean Ensminger of the California Institute of Technology in Pasadena, who spent several years with them doing fieldwork. But a religion that opened up access to economic and social networks all over the world, while ensuring everyone in that network adhered to the same standards of behavior, was "a pretty good package," she says.

Islam's spread to the Orma is an example of a broader pattern, Norenzayan says. Groups with "moralizing, interventionist deities or spirits … expand because all things being equal, they do better than the noncooperative groups," he says. "And then the beliefs expand" alongside them. "Take this idea to its extreme and we get world religions," he says, such as Islam, Christianity, Buddhism, and Hinduism.

Many scientists are impressed by the careful combination of laboratory experiments and suggestive evidence from the ethnographic and historical records that Norenzayan and his team have marshaled. But others question whether moralizing high gods require a special explanation beyond the cognitive byproduct model. "In the same way you don't need any adaptation for people to believe in supernatural agents, you don't need any adaptation to explain why people believe in moralizing religion," says Nicolas Baumard, a psychologist who studies the evolution of religion at the École Normale Supérieure in Paris. All you need, he argues, is a sufficiently affluent society in which people can afford to prioritize long-term goals (like the afterlife) over short-term needs. Studying Eurasian societies between 500 B.C.E. and 300 B.C.E., Baumard recently found that moralizing religions were much more likely to emerge in societies where people had access to more than 20,000 kilocalories in total energy resources each day, from food, fuel, and draft animals, for example.

TO PROVE THAT MORALIZING religion is an adaptive tool to increase cooperation, the big gods team needs to confirm that belief in prosocial deities actually causes followers to be nicer to each other. To that end, Norenzayan and Henrich have expanded their experimental work on religion and generosity to societies around the world. They hope to show that the more omniscient and punitive the gods that people worship, the more money they are willing to give to strangers in their own religious community. The researchers expect to publish the first results this fall.

They are also seeking more evidence for the claim that moralizing religion lays the foundation for large-scale societies. Slingerland is appealing to his historian colleagues to contribute to a new database that will assemble quantitative data about social complexity and religion (see sidebar, p. 922). "If we find there's a systematic pattern where most societies in the world scaled up without religion, I would worry," Norenzayan says. "I would say that's a falsification of the hypothesis."

Other scientists say some historical evidence already challenges it. This spring, a study in the *Proceedings of the Royal Society B* reported that out of 96 traditional Austronesian societies spread throughout the Pacific, six had moralizing high gods—and they emerged after the societies became politically complex, not before, apparently contradicting the big gods idea. Norenzayan points out, however, that the complexity of most of the cultures analyzed is limited—they are small-scale chiefdoms, not large agricultural societies. "You see moralizing gods when you get to a state-level society," he says. "But there could be lots of intermediate cases"— nature spirits that enforce taboos protecting shared resources, for example.

A third test of the big gods hypothesis is whether it accurately predicts which religions spread. The Mormons, for example, have had spectacular success spreading a faith focused on a judgmental god with strict moral rules,

In Buddhism, the concept of karma may play the role of a moralizing god, enforcing selfless behavior.

a strong cooperative ethic, and costly signs of devotion like avoiding caffeine and spending 2 years as a missionary. "It almost seems like Joseph Smith [founder of the faith] read our article" on big gods, Slingerland jokes. The team plans to use Mormonism as a template for identifying other highly prosocial religions throughout history, quantitatively recording its features and systematically searching for them in other faiths. If many of those religions also prove to have spread rapidly, that could point to a deep pattern.

Critics complain that the definition of a "moralizing" religion can be slippery. Baumard quibbles with Norenzayan's interpretation of ancient Egyptian beliefs, in which "stopping the flow of water" appears to be a sin. To Baumard, this is clearly not a moral concern, but some kind of taboo. The big gods team is "projecting a moralizing aspect onto gods that don't care about morality," he says.

Slingerland disagrees. Ancient Egypt's agriculture was exquisitely calibrated to the Nile's annual flood. If someone tampered with the irrigation system for short-term personal gain, the whole society would suffer. In the context of that society, religious injunctions against interfering with the Nile "are absolutely moral," he says.

Only Maat may have the insight to resolve that debate once and for all. In the meantime, these researchers may have found a new way to get closer to a fuller understanding of religion, from ancient Egypt to today: Hypothesize, test, and repeat. ■

Turning history into a binary code

By **Lizzie Wade**

In January of this year, Anders Petersen folded his nearly 2-meter frame into an airplane seat for a flight from Copenhagen to Vancouver, Canada, crossing two continents on his way to check boxes on a computer screen. It would be a new experience for the religious studies scholar from Aarhus University in Denmark, who, like many in the humanities, has made a career out of "sitting in a room and writing my books and my articles" alone, eschewing even a cellphone. Now, he had agreed to help test a burgeoning new theory about the origins of religion (see main story, p. 918) by translating the nuanced knowledge in his head into the kind of data that scientists need: a database's binary code of yes/no answers.

Petersen, who studies the religious movements—including early Christianity—that sprang up across the Mediterranean about 2000 years ago, was creating an entry for the Database of Religious History (DRH), the brainchild of a multidisciplinary team investigating the evolution of religion. They're attempting to bridge the gulf between humanistic and scientific scholarship, but success hinges on enticing leading scholars like Petersen to join them.

Many are reluctant. Cross-cultural databases like the DRH "are going to make the humanities a lot more powerful than they are now," says Yale University historian Joseph Manning, who has written a DRH entry on ancient Egypt. But "a lot of my colleagues think the opposite." Since the rise of postmodernism in the 1960s, the

humanities have strenuously rejected the idea of a single "truth" in favor of understanding the world as an endless series of cultural "texts" whose meanings constantly shift. Comparing one culture with another came to be seen as meaningless at best, racist at worst.

Yet historical, cross-cultural information is what psychologist Ara Norenzayan of the University of British Columbia (UBC), Vancouver, needs to test his "big gods" hypothesis. Did moralizing gods, community-wide
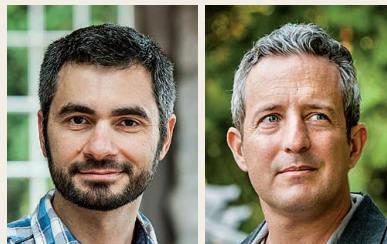
Ara Norenzayan (left) and Edward Slingerland are recruiting historians to help test the big gods hypothesis.

rituals, and supernatural punishment emerge before or after societies became politically complex? Has any large-scale society succeeded without prosocial religion? And what does "moralizing" really mean in different cultures and at different times?

To answer these questions in a way that goes "beyond cherry-picking and anecdote," scientists need an unbiased, scientific survey of religions, says Edward Slingerland, a historian at UBC Vancouver who is heading up the DRH. And the only way to get that is to "force historians to do what historians hate to do"—turn their qualitative knowledge

into black-and-white quantitative data.

Petersen, the Danish religious scholar, was one of the first to agree to try it. When he arrived in Vancouver, Slingerland and several grad students were on hand to guide him through hundreds of yes/no questions. Petersen chose one sect to focus on: Pauline Christianity, as expressed in texts written by the apostle Paul between 48 C.E. and 56 C.E. Some of the questions were easy. Is a supreme high god present? (Yes.) Does that god care about murder? (Yes.) Gossiping? (Yes.) Disrespecting elders? (No.)

Others stumped him. For example, it's impossible to tell how many adherents Pauline Christianity had based solely on Paul's writings, and Christianity left no archaeological record until later. It's even possible that Paul was writing only for himself, Petersen says. But the DRH doesn't leave much room for that kind of uncertainty, so when confronted with questions about community size and structure, Petersen checked "Field doesn't know" and moved on. All told, it took him 2.5 exhausting hours to turn the knowledge in his head into check marks on a computer screen.

Now up to about 60 entries, the DRH is still in its infancy. Recruiting is slow going and depends heavily on Slingerland's personal connections. He's not above showing up to colleagues' houses bearing gifts; Petersen admits that his participation was helped along by their "shared love of Italian red wine." Slingerland believes going directly to top experts shows "we take humanistic scholarship seriously," and that once enough high-profile scholars participate, it will create a snowball effect. Reaching that critical mass, however, will take a lot of work—and wine. ■