

Dear Juliet,

Now that you are ten, I want to write to you about something that is important to me. Have you ever wondered how we know the things that we know? How do we know, for instance, that the stars, which look like tiny pinpricks in the sky, are really huge balls of fire like the sun and are very far away? And how do we know that Earth is a smaller ball whirling round one of those stars, the sun?

The answer to these questions is "evidence." Sometimes evidence means actually seeing (or hearing, feeling, smelling.....) that something is true. Astronauts have travelled far enough from earth to see with their own eyes that it is round. Sometimes our eyes need help. The "evening star" looks like a bright twinkle in the sky, but with a telescope, you can see that it is a beautiful ball – the planet we call Venus. Something that you learn by direct seeing (or hearing or feeling.....) is called an observation.

Often, evidence isn't just an observation on its own, but observation always lies at the back of it. If there's been a murder, often nobody (except the murderer and the victim!) actually observed it. But detectives can gather together lots of other observations which may all point toward a particular suspect. If a person's fingerprints match those found on a dagger, this is evidence that he touched it. It doesn't prove that he did the murder, but it can help when it's joined up with lots of other evidence. Sometimes a detective can think about a whole lot of observations and suddenly realise that they fall into place and make sense if so-and-so did the murder.

Scientists - the specialists in discovering what is true about the world and the universe - often work like detectives. They make a guess (called a hypothesis) about what might be true. They then say to themselves: *If* that were really true, we ought to see so-and-so. This is called a prediction. For example, if the world is really round, we can predict that a traveler, going on and on in the same direction, should eventually find himself back where he started. When a doctor says that you have the measles, he doesn't take one look at you and *see* measles. His first look gives him a *hypothesis* that you *may* have measles. Then he says to himself: If she has measles I ought to see..... Then he runs through the list of predictions and tests them with his eyes (have you got spots?); hands (is your forehead hot?); and ears (does your chest wheeze in a measly way?). Only then does he make his decision and say, " I diagnose that the child has measles." Sometimes doctors need to do other tests like blood tests or X-Rays, which help their eyes, hands, and ears to make observations.

The way scientists use evidence to learn about the world is much cleverer and more complicated than I can say in a short letter. But now I want to move on from evidence, which is a good reason for believing something , and warn you against three bad reasons for believing anything. They are called "tradition," "authority," and "revelation."

First, tradition. A few months ago, I went on television to have a discussion with about fifty children. These children were invited because they had been brought up in lots of different religions. Some had been brought up as Christians, others as Jews, Muslims, Hindus, or Sikhs. The man with the microphone went from child to child, asking them what they believed. What they said shows up exactly what I mean by "tradition." Their beliefs turned out to have no

connection with evidence. They just trotted out the beliefs of their parents and grandparents which, in turn, were not based upon evidence either. They said things like: "We Hindus believe so and so"; "We Muslims believe such and such"; "We Christians believe something else."

Of course, since they all believed different things, they couldn't all be right. The man with the microphone seemed to think this quite right and proper, and he didn't even try to get them to argue out their differences with each other. But that isn't the point I want to make for the moment. I simply want to ask where their beliefs come from. They came from tradition. Tradition means beliefs handed down from grandparent to parent to child, and so on. Or from books handed down through the centuries. Traditional beliefs often start from almost nothing; perhaps somebody just makes them up originally, like the stories about Thor and Zeus. But after they've been handed down over some centuries, the mere fact that they are so old makes them seem special. People believe things simply because people have believed the same thing over the centuries. That's tradition.

The trouble with tradition is that, no matter how long ago a story was made up, it is still exactly as true or untrue as the original story was. If you make up a story that isn't true, handing it down over a number of centuries doesn't make it any truer!

Most people in England have been baptised into the Church of England, but this is only one of the branches of the Christian religion. There are other branches such as Russian Orthodox, the Roman Catholic, and the Methodist churches. They all believe different things. The Jewish religion and the Muslim religion are a bit more different still; and there are different kinds of Jews and of Muslims. People who believe even slightly different things from each other go to war over their disagreements. So you might think that they must have some pretty good reasons – evidence – for believing what they believe. But actually, their different beliefs are entirely due to different traditions.

Let's talk about one particular tradition. Roman Catholics believe that Mary, the mother of Jesus, was so special that she didn't die but was lifted bodily in to Heaven. Other Christian traditions disagree, saying that Mary did die like anybody else. These other religions don't talk about much and, unlike Roman Catholics, they don't call her the "Queen of Heaven." The tradition that Mary's body was lifted into Heaven is not an old one. The bible says nothing on how she died; in fact, the poor woman is scarcely mentioned in the Bible at all. The belief that her body was lifted into Heaven wasn't invented until about six centuries after Jesus' time. At first, it was just made up, in the same way as any story like "Snow White" was made up. But, over the centuries, it grew into a tradition and people started to take it seriously simply *because* the story had been handed down over so many generations. The older the tradition became, the more people took it seriously. It finally was written down as an official Roman Catholic belief only very recently, in 1950, when I was the age you are now. But the story was no more true in 1950 than it was when it was first invented six hundred years after Mary's death.

I'll come back to tradition at the end of my letter, and look at it in another way. But first, I must deal with the two other bad reasons for believing in anything: authority and revelation.

Authority, as a reason for believing something, means believing in it because you are told to

believe it by somebody important. In the Roman Catholic Church, the pope is the most important person, and people believe he must be right just because he is the pope. In one branch of the Muslim religion, the important people are the old men with beards called ayatollahs. Lots of Muslims in this country are prepared to commit murder, purely because the ayatollahs in a faraway country tell them to.

When I say that it was only in 1950 that Roman Catholics were finally told that they had to believe that Mary's body shot off to Heaven, what I mean is that in 1950, the pope told people that they had to believe it. That was it. The pope said it was true, so it had to be true! Now, probably some of the things that that pope said in his life were true and some were not true. There is no good reason why, just because he was the pope, you should believe everything he said any more than you believe everything that other people say. The present pope (1995) has ordered his followers not to limit the number of babies they have. If people follow this authority as slavishly as he would wish, the results could be terrible famines, diseases, and wars, caused by overcrowding.

Of course, even in science, sometimes we haven't seen the evidence ourselves and we have to take somebody else's word for it. I haven't, with my own eyes, seen the evidence that light travels at a speed of 186,000 miles per second. Instead, I believe books that tell me the speed of light. This looks like "authority." But actually, it is much better than authority, because the people who wrote the books have seen the evidence and anyone is free to look carefully at the evidence whenever they want. That is very comforting. But not even the priests claim that there is any evidence for their story about Mary's body zooming off to Heaven.

The third kind of bad reason for believing anything is called "revelation." If you had asked the pope in 1950 how he knew that Mary's body disappeared into Heaven, he would probably have said that it had been "revealed" to him. He shut himself in his room and prayed for guidance. He thought and thought, all by himself, and he became more and more sure inside himself. When religious people just have a feeling inside themselves that something must be true, even though there is no evidence that it is true, they call their feeling "revelation." It isn't only popes who claim to have revelations. Lots of religious people do. It is one of their main reasons for believing the things that they do believe. But is it a good reason?

Suppose I told you that your dog was dead. You'd be very upset, and you'd probably say, "Are you sure? How do you know? How did it happen?" Now suppose I answered: "I don't actually know that Pepe is dead. I have no evidence. I just have a funny feeling deep inside me that he is dead." You'd be pretty cross with me for scaring you, because you'd know that an inside "feeling" on its own is not a good reason for believing that a whippet is dead. You need evidence. We all have inside feelings from time to time, sometimes they turn out to be right and sometimes they don't. Anyway, different people have opposite feelings, so how are we to decide whose feeling is right? The only way to be sure that a dog is dead is to see him dead, or hear that his heart has stopped; or be told by somebody who has seen or heard some real evidence that he is dead.

People sometimes say that you must believe in feelings deep inside, otherwise, you'd never be confident of things like "My wife loves me." But this is a bad argument. There can be plenty of

evidence that somebody loves you. All through the day when you are with somebody who loves you, you see and hear lots of little titbits of evidence, and they all add up. It isn't a purely inside feeling, like the feeling that priests call revelation. There are outside things to back up the inside feeling: looks in the eye, tender notes in the voice, little favors and kindnesses; this is all real evidence.

Sometimes people have a strong inside feeling that somebody loves them when it is not based upon any evidence, and then they are likely to be completely wrong. There are people with a strong inside feeling that a famous film star loves them, when really the film star hasn't even met them. People like that are ill in their minds. Inside feelings must be backed up by evidence, otherwise you just can't trust them.

Inside feelings are valuable in science, too, but only for giving you ideas that you later test by looking for evidence. A scientist can have a "hunch" about an idea that just "feels" right. In itself, this is not a good reason for believing something. But it can be a good reason for spending some time doing a particular experiment, or looking in a particular way for evidence. Scientists use inside feelings all the time to get ideas. But they are not worth anything until they are supported by evidence.

I promised that I'd come back to tradition, and look at it in another way. I want to try to explain why tradition is so important to us. All animals are built (by the process called evolution) to survive in the normal place in which their kind live. Lions are built to be good at surviving on the plains of Africa. Crayfish to be good at surviving in fresh water, while lobsters are built to be good at surviving in the salt sea. People are animals, too, and we are built to be good at surviving in a world full of other people. Most of us don't hunt for our own food like lions or lobsters; we buy it from other people who have bought it from yet other people. We "swim" through a "sea of people." Just as a fish needs gills to survive in water, people need brains that make them able to deal with other people. Just as the sea is full of salt water, the sea of people is full of difficult things to learn. Like language.

You speak English, but your friend Ann-Kathrin speaks German. You each speak the language that fits you to "swim about" in your own separate "people sea." Language is passed down by tradition. There is no other way. In England, Pepe is a dog. In Germany he is *ein Hund*. Neither of these words is more correct, or more true than the other. Both are simply handed down. In order to be good at "swimming about in their people sea," children have to learn the language of their own country, and lots of other things about their own people; and this means that they have to absorb, like blotting paper, an enormous amount of traditional information. (Remember that traditional information just means things that are handed down from grandparents to parents to children.) The child's brain has to be a sucker for traditional information. And the child can't be expected to sort out good and useful traditional information, like the words of a language, from bad or silly traditional information, like believing in witches and devils and ever-living virgins.

It's a pity, but it can't help being the case, that because children have to be suckers for traditional information, they are likely to believe anything the grown-ups tell them, whether true or false, right or wrong. Lots of what the grown-ups tell them is true and based on evidence, or at least sensible. But if some of it is false, silly, or even wicked, there is nothing to stop the children

believing that, too. Now, when the children grow up, what do they do? Well, of course, they tell it to the next generation of children. So, once something gets itself strongly believed – even if it is completely untrue and there never was any reason to believe it in the first place – it can go on forever.

Could this be what has happened with religions? Belief that there is a god or gods, belief in Heaven, belief that Mary never died, belief that Jesus never had a human father, belief that prayers are answered, belief that wine turns into blood – not one of these beliefs is backed up by any good evidence. Yet millions of people believe them. Perhaps this because they were told to believe them when they were told to believe them when they were young enough to believe anything.

Millions of other people believe quite different things, because they were told different things when they were children. Muslim children are told different things from Christian children, and both grow up utterly convinced that they are right and the others are wrong. Even within Christians, Roman Catholics believe different things from Church of England people or Episcopalians, Shakers or Quakers, Mormons or Holy Rollers, and are all utterly convinced that they are right and the others are wrong. They believe different things for exactly the same kind of reason as you speak English and Ann-Kathrin speaks German. Both languages are, in their own country, the right language to speak. But it can't be true that different religions are right in their own countries, because different religions claim that opposite things are true. Mary can't be alive in Catholic Southern Ireland but dead in Protestant Northern Ireland.

What can we do about all this ? It is not easy for you to do anything, because you are only ten. But you could try this. Next time somebody tells you something that sounds important, think to yourself: "Is this the kind of thing that people probably know because of evidence? Or is it the kind of thing that people only believe because of tradition, authority, or revelation?" And, next time somebody tells you that something is true, why not say to them: "What kind of evidence is there for that?" And if they can't give you a good answer, I hope you'll think very carefully before you believe a word they say.

Your loving

Daddy

RICHARD DAWKINS is an evolutionary biologist; reader in the Department of Zoology at Oxford University; fellow of New College. He began his research career in the 1960s as a research student with Nobel Prize-winning ethologist Nico Tinbergen, and ever since then, his work has largely been concerned with the evolution of behavior. Since 1976, when his first book, *The Selfish Gene*, encapsulated both the substance and the spirit of what is now called the sociobiological revolution, he has become widely known, both for the originality of his ideas and for the clarity and elegance with which he expounds them. A subsequent book, *The Extended Phenotype*, and a number of television programs, have extended the notion of the gene as the unit of selection, and have applied it to biological examples as various as the relationship between hosts and parasites and the evolution of cooperation. His following book, *The Blind Watchmaker*, is widely read, widely quoted,

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