

spirit

SOUTHWEST AIRLINES + AIRTRAN

Van Phillips asked
three questions
that changed the world.
You can ask them too.





STARTING LINE

Van Phillips
launched a journey
of invention by
asking, "Why?"

What if you found that
creative genius does not lie
in knowing all of the answers?

**Chasing
Beautiful
Questions**

By WARREN BERGER

Photography by DAVE LAURIDSEN

I first came upon

Van Phillips and his

desperate, beautiful question

when I saw a small news item about how people who had lost one or both legs were using advanced prosthetic limbs that enabled them to run and jump normally. *Who created such an amazing device?*, I wondered. This question, and the ones that followed, would change the direction of my life.

In the summer of 1976, Phillips was a young broadcast major in college. A handsome and athletic 21-year-old, he was water-skiing on a lake in Arizona when a fire broke out on the boat pulling him. In the confusion, the boat's driver failed to see another motorboat rounding a curve in the lake, headed straight at Phillips.

He awoke the next morning in a hospital. As he recalls, "I did the proverbial 'I don't want to look, but let's see.'" Lifting the blanket, he saw an empty place where his left foot should have been. The other boat's propeller had severed his leg 6 inches below the knee. Hospital staff fitted him with a standard prosthetic; Phillips describes it as "a pink foot attached to an aluminum tube." He left the hospital with instructions: Walk on it twice a day to toughen up the stump. One of the first times he tried to walk on the foot, he tripped on a pebble the size of a pea. And he knew, right then, this was not going to work for him.

"Van, you're just going to have to learn to accept this," his girlfriend's father told him.

"I bit my tongue," Phillips recalls. "I knew he was right, in a way. I did have to accept that I was an amputee—but I would not accept the fact that I had to wear this foot."

And then he asked a question that would change the world of prosthetics: *If they can put a man on the moon, why can't they make a better foot?*

It was a good question. But it did not become a beautiful question—one that leads to invention and profound change—until Phillips changed a pronoun. Gradually, he found himself taking ownership of the question. Instead of asking, *Why can't they make a better foot*, he asked, *Why can't I?*

Abandoning his broadcasting career plans, he transferred to Chicago's Northwestern University, which offers one of the top programs in prosthetics engineering. His journey of inquiry

would extract lessons from the animal kingdom, the local swimming pool, and the battlefields of ancient China. And along the way, he would face the skepticism of experts—the ones who already had all the answers.

ALL PHILLIPS HAD was questions: *Why are they using wood when other, more promising materials are available? Why do they seem to be more concerned with aesthetics (trying, unsuccessfully, to mimic the look of a human foot) than with performance?* His lack of answers proved to be a blessing. Experts tend to be disinclined to question things—after all, if you already "know," why ask? But as Phillips immersed himself in technical training, he continued to question the prevailing assumptions of that field.

He also began to look outside the world of prosthetics for fresh ideas and influences. The spring-force power of a swimming-pool diving board made him think there might be something in its physics for him. Studying animal leg movements, he saw that the powerful tendons in the hind legs of a cheetah exhibited interesting spring-force dynamics, too. An antique Chinese sword of his father's also drew his attention; its curved blade was stronger and more flexible than a straight one.

Over the years, these findings took him from *Why?* to *What if?* He eventually asked, *What if a prosthetic limb could borrow some of the dynamic qualities of a cheetah's leg? What if it had no heel and no right angles—just a curved, C-shaped blade?*

Those *What if?*'s quickly led to *How?* Using carbon graphite, he created rudimentary models of a prosthetic limb—a couple hundred over the course of a decade. He tested each one by attaching it to his own stump, standing on it, and then attempting to run. Inevitably, the prototype would collapse and send Phillips tumbling to the ground. But instead of giving up, he responded with more inquiry: *What did I do wrong this time? How can I make it better next time?*

One day, Phillips got the answer he was seeking. He put on the newest version of the foot.



**AHEAD OF
THE CURVE**
Prosthetics
were rigid until
Phillips asked,
“What if we use
a C-shape?”

He stood. He ran. And he found himself still standing. Phillips' Flex-Foot limb—which paved the way for the later development of the famous "Cheetah" blade—revolutionized prosthetics. A person with an artificial leg and foot could now run, jump, and even compete on an Olympic level, as double-amputee runner Oscar Pistorius did in 2012. For Phillips, the impact hit closer to home. Using his own creation, he was able to return to one of his great passions in life, running—which he does every morning to this day.

VAN PHILLIPS' STORY—and in particular, his indomitable spirit of inquiry—changed the way I think about questions. I've learned that they can do more than make conversation interesting: Questions can transform the world as we know it—if they're the kinds of ambitious and "beautiful" questions that Phillips asked.

What is a beautiful question? It's one that challenges assumptions, considers new possibilities, and has potential to serve as a catalyst for action and change. It's not easy to pose such queries in a world of facile answers and hard realities. But as I began to look beyond Phillips' story and combed through some of the breakthrough ideas and innovations that have reworked the way we live in recent years, I found that many of them originated with someone questioning the existing, accepted way of doing things.

Through questioning, "we can organize our thinking around what we don't know," says Steve Quatrano of the Right Question Institute, a Cambridge, Massachusetts-based nonprofit dedicated to studying and teaching effective questioning. A question is like a flashlight that we shine into the darkness, allowing us to move forward into the unknown and uncertain. And as the philosopher Bertrand Russell once remarked, "In all affairs it's a healthy thing now and then to hang a question mark on the things you have long taken for granted."

Yet one of the things we take for granted is questioning itself, perhaps because it's so apparently easy that a young child can do it—profusely, in fact. One study found that 4-year-old girls ask more than 300 questions a day; another discovered that, on average, a child asks 40,000 questions between the ages of 2 and 5.

For various reasons, we tend to ask fewer and fewer questions as we mature; a kindergartner's hundreds of queries have all but stopped by high school. Schools tend to discourage them, and

Questions That Can Change Your Life

Innovators often go through these three questions, repeating the cycle many times before getting a brilliant answer.

Why?

This question lets you confront a problem, articulate the challenge at hand, and try to understand it better. *Why does a particular situation exist? Why does it present a problem? Why has no one addressed this problem?*

What if?

While *why* questions help us understand our present reality, *what if* questions help us envision what might be. *What if I come at this problem from a different direction? What if I try some combination of X and Y? What if I borrow an idea from an unrelated area?*

How?

Now you begin to turn speculation into reality. *How* questions tend to be practical and actionable. *How can I get this done? How might I take the first steps? If my idea isn't working, how can I figure out what's wrong and fix it?*

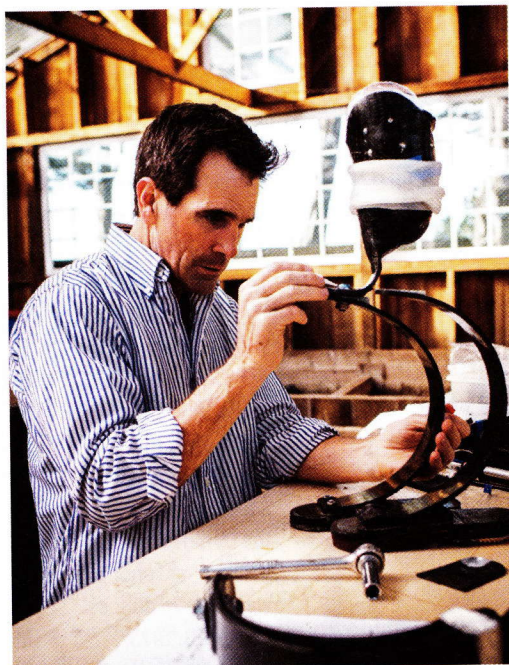
students get graded more for their answers than for their questions. Bosses get impatient when their workers ask too many questions, especially ones that challenge their assumptions. We stop asking out of fear of looking foolish. Or we simply want to get things done in our lives—who has time to pause and question? But after I spoke with Phillips, I wondered, *What if we didn't stop questioning? What if we kept asking why and what if?*

So I decided to ask some of the most creative and successful people in the U.S. not what they knew, but what questions they asked themselves. My three years of inquiring into inquiry began in Silicon Valley, where the startup mentality sees questioning as a key to innovation rather



BACK TO BASICS

In his home workshop, Phillips continues to ask himself, “How can I help amputees walk again?”



than as a threat to corporate hierarchy. I talked to scientists, inventors, and basement tinkerers as well as artists whose work pursues big questions. I found teachers and education groups trying to encourage more questioning in schools and social activists trying to reframe the questions at the core of our biggest global problems.

While every “master questioner” I met had a unique approach to inquiry, I discovered common threads—the basics of Questioning 101, if you will. To question well and productively requires stepping back from habits, assumptions, and familiar thoughts; listening to and closely observing the world around you; being unafraid to ask naïve or fundamental questions; and being

willing to stay with the questions as you endeavor to understand and act on them.

Master questioners like Van Phillips ask questions like *Why isn't this situation working as well as it might? What if I (or we) were to change it in some way? How might we begin to do that?* And they often do so in a sort of progression. They tend to move from curious *Why* questions to speculative *What if* ones, eventually working their way to more practical, action-oriented *How* questions.

As I studied the ways Phillips and others applied rigorous, step-by-step inquiry to the challenges they faced, I couldn't help doing likewise. At the time, I was dealing with uncomfortable changes and uncertainties in my own life and work. The recent death of my father had left a void. My work—writing articles and occasional of-the-moment books—didn't seem to be leading to anything larger. I wanted to work on something more meaningful, with more of an impact on people's lives. But I wasn't sure how to find that new path.

The answer, I found, lies in questions—beautiful questions. As a journalist, I had been asking questions of other people for years. But asking

It Started with a Question

Some of the world's coolest (or just plain indispensable) inventions began with a bold inquiry.

"Why is it that when we want to call a person, we have to call a place?"

QUESTIONER Martin Cooper, general manager of Motorola's communications systems division

THE STORY Inspired by a *Star Trek* scene where Captain Kirk uses a mobile "communicator" to speak with a crew member, Cooper worked with a team to develop the DynaTAC 8000X, a hand-held phone weighing 28 ounces. On April 3, 1973, Cooper made the first public call from a **mobile phone**.

"Why did my candy bar melt?"

QUESTIONER Percy Spencer, self-taught inventor and engineer

THE STORY Spencer, an employee of defense contractor Raytheon Company during WWII, worked with magnetron tubes, which were used in radar. One day, he noticed a chocolate bar in his pocket had melted while he stood next to an active set. With popcorn kernels, he confirmed a hunch that the microwave-emitting magnetron had heated the candy. In October 1945, Raytheon patented the **microwave oven**. It was nearly 6 feet tall and weighed 750 pounds.

"Why can't windshields be cleared without opening the window?"

QUESTIONER

Mary Anderson, businesswoman

THE STORY One winter, while visiting NYC, Anderson saw a trolley operator keeping his windshield open so he could see through the rain and snow. Back home in Alabama, she created a manually powered contraption that a driver could control from within the vehicle to move a rubber blade across the window. Anderson was granted a patent for her **windshield wiper** in late 1903.

"Why do we have to wait for the photo?"

QUESTIONER Jennifer Land, 3-year-old daughter of inventor Edwin Land

THE STORY Edwin Land was on vacation in Santa Fe, New Mexico, when his impatient child piped up with this question. Land, a self-taught physicist and a Harvard dropout, didn't have an answer, so he went on a walk through town to ponder her query. Within an hour, he'd conceived of the basic mechanics of an instant camera. The **Polaroid Land Camera** went on the market in 1948.

them of myself? Not so much. I think this is true for many of us: We aren't comfortable asking ourselves questions for which we may not have easy answers. Yet Phillips taught me that when faced with disruption and uncertainty, we need to be willing to question. I began to ask, *Why am I feeling dissatisfied with my work? What if I could shift toward something more meaningful and long-term, on an issue that seems relevant in these changing times? How might I find something like that?* Of course, it was right under my nose. The questions themselves were the answer.

Gradually, through subsequent inquiry, I began to figure out how I might explore and pursue the subject of questioning in a manner that went beyond my usual modus operandi of writing about something and then quickly moving on to the next story. I came up with a beautiful question that I was willing to commit

to and spend time with: *How might I encourage others to question more?*

Already, it has led me out of my comfort zone and into new areas. I began to change the way I worked, becoming more collaborative. I enlisted a group of volunteer researchers to help track down stories of beautiful questions. I also joined forces with the Right Question Institute—the small group of fellow pioneers on the frontier of exploring questioning—and together we asked, *How might we find ways to bring more and better questioning into schools, businesses, and government organizations?* In the grandest sense, we're endeavoring to promote more curiosity and questions in a world that seems to need it more than ever.

That's a daunting mission; at times I feel terrifyingly and gloriously in over my head. But the questions I asked myself keep beckoning, and I'll follow where they take me. Meanwhile, my

“What if Morse code could be adapted graphically?”

QUESTIONER Norman Woodland, grad student at Drexel Institute of Technology

THE STORY Woodland was looking for a way to automate supermarket checkouts. (A friend had overheard the president of a local grocery chain discussing the topic with a dean at Drexel.) After a few failed attempts, Woodland drew on his childhood experience as a Boy Scout and turned the dots and dashes of Morse code into vertical lines of varying widths—thus creating the **bar code**.

“Why are the players losing so much weight during games?”

QUESTIONER Dwayne Douglas, assistant football coach at the University of Florida

THE STORY Douglas had good reason to be concerned: His players were dropping up to 18 pounds in a game and weren't taking any bathroom breaks. He talked to Robert Cade, a UF kidney-disease specialist. Cade and his team concocted a formula that would restore the water and electrolytes that were being lost in sweat. Today, we know the drink as **Gatorade**.

beautiful question has given me a new sense of direction and purpose.

COULD A BEAUTIFUL question do the same for you? And where might you find your question? You could start by looking at your interests and passions. Ask yourself about what moves you, what you care deeply about, what you feel you were meant to do. Look for a problem that needs solving in your business, community, or family. Your

beautiful question may involve something right in front of you—you may need to step back mentally to try to see the familiar from a different angle and in a new light.

If you find something crying out for improvement, innovation, and fresh thinking, start exploring with *why* questions, and then work your way to *what if* and *how* questions. *How* is usually the hard part; ultimately, that's where your beautiful question may lie. When phrasing *how* questions, here's a helpful tip I learned from master questioners at companies such as Google and the design firm IDEO: Try using the words *How might I* (instead of *How can I* or *How should I*). The “might” offers a great way to phrase a question that is open and expansive yet still practical.

When you find your beautiful question, be prepared to own it and to live with it. We are used to getting quick answers on Google, but a beautiful question calls for a very different kind of search. You may have to follow it into unfamiliar places, grapple with it, and change it over time. You'll be imitating Einstein, who said, “It's not that I'm so smart. But I stay with the questions much longer.”

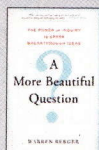
Van Phillips certainly has. Today, almost 40 years after he first began to inquire about creating a better prosthetic foot, he still pursues the same question—in a revised, updated form. Now in his late 50s, Phillips works at his home in a coastal village near Mendocino, California. He keeps his tools in an armoire and often toils near a large window overlooking the ocean. His latest work began with the realization that, after all the accolades, his creation had provided an answer for some but not others. So he cycled through the questions once more:

Why does the foot have to cost so much to make?

What if it could be made so that land-mine victims in poorer nations could afford it?

How might I tweak the design to allow for this, without compromising performance?

He has developed a new answer and hopes to soon solve the puzzle of distributing it worldwide. Still, as Phillips can tell you, answers have a way of becoming insufficient or obsolete over time. Only the question endures.



Warren Berger's latest book, *A More Beautiful Question: The Power of Inquiry to Spark Breakthrough Ideas*, was published in March by Bloomsbury. Berger writes regularly for *Fast Company* and *Harvard Business Review*, and he has appeared on the *Today Show* and NPR's *All Things Considered*. *Bloomberg Businessweek* named his first book, *Glimmer*, one of the best innovation books of 2009. Learn more about creative questioning at amorebeautifulquestion.com and rightquestion.org.