INTERVIEW WITH DEAN KAMEN

The Segway Human Transporter (HT) is efficient where urban driving currently is not. How so?

Cars are perfect machines for a discreet mission. Their performance is optimized at 50, 60, 70 miles an hour. They carry you and your whole family and keep you warm in the winter and cool in the summer and move you between cities. It's fun to do that, it's efficient to do that. Then you put a car in the middle of a city, with one person in it. That one person is trying to get one mile or two at a speed much less than the distance he or she wants to travel. It's absurd. Especially since half of all car trips in the U.S. are less than a few miles. With cars creeping along causing congestion and pollution, they are no longer efficient. And with half of the human population now living in cities, there has to be another way to travel short distances. What if you could give the pedestrian, with a Segway HT, the ability to glide along the sidewalk at 8, 9, or 10 miles an hour? You would have given them a safe option that is not only cleaner, but also more efficient. And, by the way, a lot of fun!

Dean, what is it about a Segway HT that makes people smile when they step on it?

When you first climb aboard a Segway HT, you feel like a kid when he stands up for the first time. You're bewildered. As you think forward, the machine starts to move forward. As you feel yourself wanting to step back, it intuits this and reverses. The experience of being on a Segway HT isn't really like anything else. It's like watching yourself learn to acquire the capability to balance.

Being that there are no brakes, engine, throttle, gearshift or steering wheel, I assume you would agree with Arthur C. Clarke's statement, "Any sufficiently advanced technology is indistinguishable from magic."

I not only agree with that statement, I would say that we work hard to live up to that standard with most of our projects. If a client doesn't say, "Wow, that's amazing!" I assume we haven't succeeded yet. Building the iBOT 3000 Mobility System, an enhanced advance on the wheelchair that uses cutting-edge robotics to allow the disabled to stand up, look their colleagues in the eye and walk up a flight of stairs is one very vivid example. Building medical equipment so that people can dialyze themselves at home instead of living three nights of every week in an iron lung in a hospital room is another. We dedicate ourselves to projects that significantly change people's lives.

How do urban centres in both the developed and developing worlds need to be re-architected to accommodate the Segway HT?

If you wanted to put a Segway HT in ancient Greece or modern day mega cities like Tokyo, New York, Paris or Mexico City, the only thing you have to do is change peoples' attitudes. Transportation infrastructure is not required. If people can walk there, Segway HTs can roll there. To the extent that you allow this to happen, every time a Segway HT takes one of those trips it eliminates the need for a car. It frees up the space. It cleans up the air. Everybody wins. The Segway HT is an option that doesn't require we fill up the spaces between buildings with 3,000-pound machines snorting at each other. Cities were meant to be pedestrian environments, with people moving shoulder-to-shoulder through the space. Let's take them back and make them that way.

Has the automotive industry tried to hold you back at all?

When it comes right down to it, ours are non-competitive technologies. Cars and planes aren't really competitive either. A plane is a great way to travel thousands of miles, the car is good for 50 or 60 miles, but when you get to that last mile or two the plane is totally absurd and the car is almost as absurd. So I think the automotive industry recognizes that the Segway HT is what it is – one of many mobility alternatives.

I understand that you have quite an extensive and impressive collection of vehicles.

Yes, it's true. I am not a naïve green person who insists on eliminating technology. I'd be the first to admit that I have cars and helicopters and airplanes. When the machine fits the mission, I believe technologies improve the quality of our lives. The problem with this last mile, the niche distance between walking and driving, is that nobody until now had the right technology to apply to it.

Both the IBOT and the Segway HT employ complex software and microprocessor technology. But they also carry the wisdom of the gyroscope. Why is that?
The physics of gyroscopes is one of the more elegant pieces of pure science that you could ever contemplate. Its application in the iBOT and the Segway HT are about simulating human balance. In the building of the iBOT 3000 Mobility System, we inadvertently discovered the Segway HT. We realized that since our gyroscopes are more sensitive than the inner ear, that our computers are faster than typical reflexes, and that our motors are more powerful than the muscles in our legs, we could use these technological enhancements for the able-bodied too.

When did you know you wanted to make things that really helped people?
I feel that if I'm going to spend months and usually years and sometimes decades – in the case of the iBOT – on anything, it has to be worth it for me. It has to be something that, if successful, makes a difference in a meaningful way. I just couldn't put time, energy and passion into things that didn't matter.

What's next?
Oh boy, what's next! You know, I got myself in trouble the last time I talked about something before it was done. I'm learning my lesson. But I can say that right now I continue to work on what I think are important pieces of technology that have medical applications and will improve people's lives. We're working on ways to do for water and electricity what the cell phone did for communications – most especially for people in the developing world, who will likely never have an electrical or water grid. We hope to

help them leapfrog over the twentieth century utilities infrastructure right into the twenty-first century, so that they can be on par with the developed world.

Dean Kamen is the President of DEKA Research and Development Corporation in Manchester, New Hampshire. A self-taught physicist and mechanical engineer devoted to human welfare, he holds more than a 150 patents for medical devices such as the first drug infusion pump and mobility devices such as the iBOT and the Segway HT. (www.dekaresearh.com)