

PURE GENIUS

JAMES DYSON: WHY WE NEED TO RE-FOCUS ON THE OLD ECONOMY



BY MELANIE D.G. KAPLAN

POSTING IN **CITIES**

ACCORDING TO BRITISH INVENTOR JAMES DYSON, THE U.S. AND BRITAIN NEEDS TO REKINDLE INTEREST IN ENGINEERING AND

MANUFACTURING. "WE NEED OUR BRIGHTEST AND MOST CREATIVE PEOPLE," HE SAYS, "TO BE GOING INTO SCIENCE AND ENGINEERING AND TECHNOLOGY."



http://i.bnet.com/blogs/jd_pr_13_a5.jpg Best known for revolutionizing the vacuum industry with his **Dual Cyclone** <http://www.dyson.com/vacuums/default.asp> bagless vacuum cleaner--and more

recently, the equally clever and functional **Airblade** (<http://www.dyson.com/dryers/default.asp>) hand-dryers and **Air Multiplier** (<http://www.dyson.com/fans/default.asp>) fans--British inventor and engineer **James Dyson** (<http://www.dyson.ie/inside/>) knows the importance of science and engineering education.

He says Britain and the U.S. face similar problems today: Our children are being persuaded to go into professions that are less “geeky” than engineering, and our universities are often training engineers that return home to countries competing with us in the global market.

Dyson's company, which has more than 1,300 patents and patent applications for more than 300 different inventions, just launched its **Dyson City** (<http://www.dyson.com/store/product.asp?product=DC26-CFIRSB>) vacuum, which is one-third the size of the its full-size vacuums but equally functional.

I spoke with Dyson last week by phone. He was in the U.S. visiting his Chicago office and meeting with people in New York to talk about education and engineering. Excerpts of our conversation are below.

What are you doing in New York?

I'm looking out from the **Four Seasons** (<http://www.fourseasons.com/>) to the leaves changing in Central Park. I've never had a room overlooking Central Park, so it's quite a treat.

I'm here [having some discussions about] President Obama's initiative to promote STEM [Science, Technology, Engineering and Mathematics] subjects, because really we have the same problem in

England. We're trying to change attitudes toward science and engineering education, because that's the basic problem. Too few children are now studying the basic science and technology subjects and moving over to art and media subjects.

A big problem in world trade is that we're just importing things instead of exporting things. To export nowadays you have to have much cheaper technology than your competitors—like China, Korea—but the problem being that in Britain and the United States we're producing a small number of engineers from the universities.

So we both have this same fundamental problem, which Obama is trying to solve.

And the answers are in New York?

Well, there are some quite interesting ways we can turn this around. One is to say what exciting things are happening in engineering. We need to keep our university researchers. They are by and large foreign. In Britain over 70 percent of the university researchers are foreign. It's nice, altruistically, to educate other people, but what you're doing is educating your competitors. So you want to make sure you hang onto them or make sure you're doing your own research. So you want to put in financial incentives.

Government, historically, hasn't been necessary. If you look at world trade now, almost any country in the world can make anything. To survive in this global marketplace, we've got to develop better technology. But at the moment, we have a mere fraction of our

competitors. China produces seven times as many engineers as the United States. We need our brightest and most creative people to be going into science and engineering and technology. There's a trade war really. Exports are important; balancing our culture is important; and rekindling our earlier interest in science, technology and engineering is extremely important.

Your foundation gives a design award every year to a university student or recent graduate who solves a problem. What do you look for in these designs?

Normally design awards are about objects that are beautiful. We think that's important, but what's really important is the technology. So we're trying to emphasize the importance of technology solving problems. We're trying to encourage this with universities. It's merely one way of emphasizing the importance of studying engineering.

What was it about this year's winner--the Longreach Buoyancy Deployment System (<http://www.jamesdysonaward.org/Projects/Project.aspx?ID=1010&RegionId=0&Winindex=0>)?

All of the finalists –the last 15 or 20—all had very good, fairly original ideas. It's very difficult to have a totally original idea. And we thought the one that won it--it was a very difficult choice between that and the safety raft (<http://www.jamesdysonaward.org/Projects/Project.aspx?ID=1551&RegionId=0&Winindex=0>) that separated salt from water. We thought however the [Longreach] was solving a real problem, allowing a person to throw a life belt very far, very accurately[to someone who is drowning]. I think people have thought of the ideas before, but it was

the way this product was created.



http://i.bnet.com/blogs/james_dyson_city.png I guess it's a lot easier to have

the idea than to actually make something that's functional and solves a problem. People say, "Oh, I could have thought of that."

It's the idea that captures the imagination, but that's only about half a percent of the perspiration. But there's nothing wrong with that. The whole point is that it's a creative activity, and that's what interests people. It's a creative activity but it's rarely portrayed as such. By showing this, we're showing that creativity solves problems.

[The idea that] manufacturing, science and engineering are not creative... it's incredibly creative. I'd venture to say more so than creative advertising agencies and things that are known as the creative industries.

Nowadays we have so many more problems to solve—making cars that use less fuel, making products that are made from sustainable resources, making projects that use less water. Suddenly we're confronted by big and exciting problems. So now is a very good time for encouraging people to enter engineering and science and develop new products. With cars and engines, it's flipped—it used to be cars with a big engines. Today, they still want a car with the performance but with a smaller engine. It's harder to make that car with a small engine, but it's miles more interesting. I [studied] classics in school, but all the things I've invented have involved engineering.

Young children often have creative ideas that grown-ups don't have, but have you found children to be good practical problem solvers when it comes to design?

Very much so, from a very early age. I remember once going to school and seeing a 9-year-old girl who had devised a way of dispensing soap with a tap. They're not weighed down by experience and what can and can't work. They're incredibly creative, and they love it. We have a subject called design and technology, and it's a very popular subject. Children like it. My theory is that they're talked out of it by their parents and teachers: "Oh, you want to be a lawyer or a doctor, or you want to go into banking." There's heavy pressure I think, by society, not to do something a bit geeky like to get into engineering.

Thirty-five percent of British teenage girls want to be models. Thirteen percent of teenage girls want to go into science. But they all want to be pathologists, because of the CSI program. So you can see how society influences children.

So we need a TV show that stars a really cool engineer.

(laughs.) Exactly. I'm sure the channels would buy that.

Britain produces 22,000 engineers a year. Half of them go to the city to be bankers. The city snaps them up. China produces 48,000 engineers a year who go into engineering.

The BBC decided to do a poll (<http://news.bbc.co.uk/2/hi/entertainment/2509465.stm>) on who was the greatest Briton ever. You can imagine the possibilities-**Shakespeare, Churchill, Princess Diana.** And **Brunel**, an engineer, came in second. Churchill first. The point is that people really are interested in engineering, but it's a closet thing. To put it right, society has to change a bit. The government and schoolmasters and people

who influence young people have to put the right emphasis on it.

Engineering and manufacturing is the old economy but that's what's important. Of the 20 the largest corporations in the world, only three are not the old economy. Seventeen are manufacturing and big engineering. So we need to get governments--as Obama is—to talk about how important engineering is and to start using phrases like the “old economy.”

For example, the space race, during Kennedy, showed the importance of science, and I'm sure that had a great effect on children on the importance of science. We need something to replace that--not something as wasteful as that but something much more useful. If the government backed such projects—like making airplanes and cars that use less fuel--universities and industry would follow. But when governments dither, when they make short-term decisions, the universities don't have that direction.



http://i.bnet.com/blogs/dyson_city.png In a recent *New Yorker*

http://www.newyorker.com/reporting/2010/09/20/100920fa_fact_seabrook article

you were quoted as saying, “All our engineers are designers and all our designers are engineers.” Explain your philosophy behind this.

Up until the mid-20th century, an engineer designed the project. All the wonderful products--and there were many beautiful products--were designed by the engineer. We then invented a separate department called industrial design, which was initially used by marketing departments to make a car look flashier.

I learned that buildings and products were about the engineering and that the design should reflect that. There shouldn't be a casing that should make it look temporary and make it sell. It's much better to show the engineering that's gone into it.

Many universities in Britain teach engineers design; so we [at Dyson] have many engineers who have learned design. But we don't have anyone who is brought in to make the product look good. We don't employ any product designers.

When you see the insides, it looks much cooler.

Well thank you for saying that. We're recognizing that 95 percent of the importance is how long it lasts and how it works. There's no reason it shouldn't have a structure that reveals that.

Is it a burden going through life noticing problems that needs to be solved?

Yes, in a way, yes. Someone once said it was a disease, but I'd say it's an

obsession probably. Once you're into solving problems, you have to do it. When you see something that does its job well, it's a delight, and when you see something that works badly, you think that's a problem that needs to be solved. People write in and say something you've created doesn't do this or that well. That's a great incentive.

Such as?

A magazine wrote in and said the vacuum cleaners don't pick up dust off hard floor very well, and I thought, that's odd. And we got down on the floor and had a look and realized that's true. The reason—when the nylon bristles go over the floor they create static. If someone with dusty footprints walks across the floor the vacuum will leave the dust there. So we developed a brush with conductive bristles--we call them fiber bristles--and they pick up the all the dust because they reverse the polarity of the charge. That's a good example of someone pointing out the problem, and a slight feeling of shame ran across me. It was a problem that had to be solved, but why did it happen? We're just about to launch that.

What is your schedule when you're home?

I spend over 80 percent of my time down with the engineers in the laboratories and I love it. In the beginning I was on my own. Then I had two people, then four and now, all in all, about 1,400 of them. They're all young and much brighter than I am.

Do you have a workshop at your house?

I do but I'm so exhausted when I got home. I'm not one of these

people who is tinkering at all hours. I used to do that. Generally I'm mending things, which is interesting because you learn a lot about why they broke.

What is it that you mend?

Putting hard drives into computers, putting these new batteries into small watches into alarm clocks, which can be quite difficult. Things in the garden. I drive an excavator. I like them because they can make an enormous amount of difference in a very short time. Not always a good difference.

NOV 2, 2010

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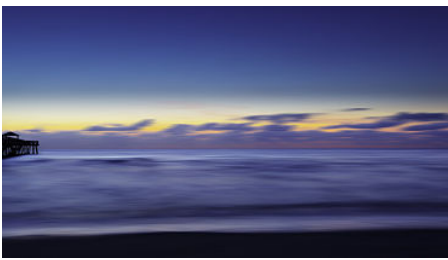


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