SCIENCE & TECHNOLOGY

Jun 16 2011

Ideas To Change The World

Founded and funded by visionary scientist James Martin, the Oxford Martin School is an innovative centre for education and collaboration that aims to tackle "the grand challenges of the 21st century". Bringing together world-class academics to discuss solutions to global issues, the institution works across four key areas: health and medicine, energy and environment, technology and society and ethics and governance.

The school's showcase at the Intelligence Squared Ideas to Change the World event at London's Royal Geographical Society in June offered a taste of some of the nearly 200 research projects currently underway. Speakers from the school discussed their visions of a better future, where inspiring innovations – ranging from improved crop plants to large-scale projects to suck carbon dioxide out of the atmosphere – could help solve some of the world's most pressing problems.

Two of the most interesting topics are discussed here.

EXTRAS

Liam Dolan: Plants for the Future

Professor Liam Dolan is a geneticist based in the Plant Sciences department at Oxford University and co-director of

IDEAS TO CHANGE THE WORLD
GALLERY / 11 IMAGES

ARTICLE REFERENCES

Oxford Martin School

Vision Thread

ILTM: Luxury Food Experiences

EVENTS / 01:00 / 16 JUN 2011

Luxury travellers want meaningful experiences rather than pure pampering: that, in a nutshell, is the core message from the International Luxury... »

Catalytic Clothing: Helen Storey

01:00 / 15 JUN 2011

Catalytic Clothing is an exciting new project from legendary London College of Fashion professor Helen Storey. Working in collaboration with chemist... »

Home of the Future

11:00 / 13 JUN 2011

The Sydney-based Laboratory for Visionary Architecture [LAVA]'s Home of the Future is a showcase for future living, with nature, technology and man... »

POD Talks

the Oxford Martin School's Institute on Plants for the 21st Century. Though his passion centres on the early evolution of plants – and how they arose from the primordial earth – his work for the School aims to show "how we can use the knowledge we've gained from doing genetic analysis of plants to actually solve some of the problems that we as a species face".

He focuses on the issue of feeding the ever-increasing world population – particularly those in less developed nations – which means increasing crop yields and driving the price of food down. A key problem is the way we use fertiliser, he maintains. Currently, 80% of the phosphate fertiliser applied to fields bypasses the plant and runs off into surrounding ecosystems. The solution, as Dolan sees it, lies in finding plants that are better at absorbing nutrients. "There are hairs on the surface of the roots that are important for the uptake of phosphate," he explains. "Theoretical models suggest that if you increase the length of these hairs then these plants will be better able to take up the phosphate that's applied."

After repeated experimentation to find the particular 'root hair' gene, Dolan's team believe they have found the one that's different between plants with root hairs and those without.

Though he is modest about the work, the results could make a huge difference. For example, he says: "Even if you could enhance the uptake of phosphate by 10% or 20% that would be a considerable change. Not only for increasing crop yields but also for decreasing the price of fertiliser."

As Dolan points out, fertiliser is dependent on diminishing earth's resources: ""It's mined, it's stuck on a ship, it's transported across the world, it's put on a train, it's put on a lorry or a truck and it's moved around". All of which adds up to a lot of carbon emissions.

The alteration of this single gene, could have positive impacts across vast landscapes. It is the far-ranging impact of this technology that makes it the perfect issue for the Oxford Martin School, which is set up to look at the bigger picture. As Dolan concludes: "This isn't just a question of plant biology or agriculture, it involves the input of economists, political philosophers, ethicists, business people, finance people and development economists. We need the whole programme."

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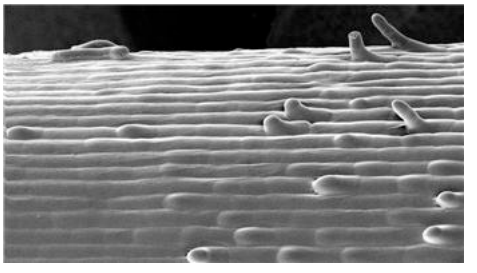
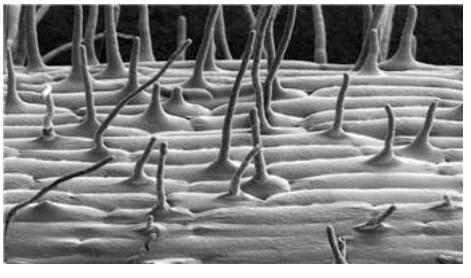
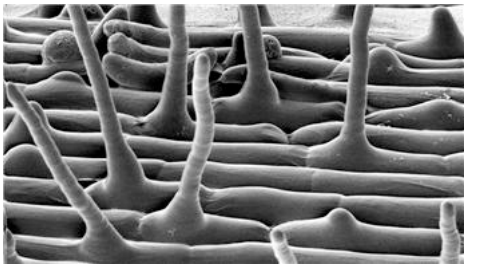






Gideon Henderson: Geoengineering

Professor Gideon Henderson's work at the department of Earth Sciences at Oxford University focuses on understanding long-term climate change and the carbon cycle to improve prediction of future change. He is co-director of the School's 21st Century Ocean Institute, looking at geo-engineering, "the idea that we can manipulate the climate intentionally".

POD Talks
01:30 / 10 JUN 2011

'Getting Above the Noise' is the latest in a series of POD (Peace One Day) talks, which is to due to take place in London on June 16th. Leading... »

The Burning House
11:00 / 09 JUN 2011

The Burning House project by US-based blogger Foster R Huntington asks questions about the appreciation of the everyday objects around you. The... »

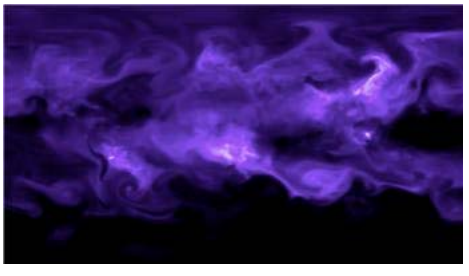
VIEW **ALL**

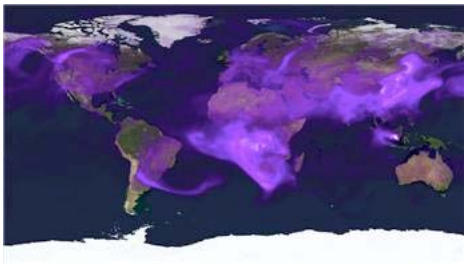
Henderson explains the idea of shading the earth, a concept that sounds more complicated than it is. It is already relatively easy to put shading mechanisms in place by seeding clouds. Henderson points out this effect when looking at the trails of clouds rising from shipping routes or the global flow of soot from the world's factories, which release particles that create clouds. Alternatively, volcanic eruptions could be mimicked to block out sunlight by scattering sulphur particles into the stratosphere. Both techniques work by reflecting the sun's heat away from the earth, but have no effect on carbon dioxide levels.

As a better idea, Henderson wonders: "How might we get the planet to gobble up more carbon for us?" The main candidate for this is ocean enrichment. As he says: "In large chunks in the middle of the ocean, iron is the limiting nutrient – the thing that runs out first – so if you put more iron in, you get more life."

The life geo-engineers are after is phytoplankton, which sucks CO2 from the atmosphere before falling harmlessly to the seabed. Because of the potency of this technique, iron dumping has been banned except for scientific research purposes. Henderson himself admits: "I think this is a good idea, I think we don't know enough yet to be able to do it commercially."

Two potentially safer options include "liming" the ocean, which has been tried successfully in lakes, and accelerating the weathering of rocks to capture more carbon from the air. To work, these solutions would have to be scaled up to industrial levels. "I'm a chemist," concludes Henderson, "and there are big chemical challenges in geo-engineering, but there are engineering challenges as well. To scale it up and implement it on a big scale there are governance issues – who's going to be in control? There are ethical issues. There are all sorts of different bits of information that you need to approach the problem with and I couldn't do that on my own".





Stylus Summary

The visionary work of the Oxford Martin School is not confined to academics, as Liam Dolan pointed out. "This isn't just a question of plant biology or agriculture, it

By tracking the research work of visionary institutes like Oxford Martin School, business can stay informed of key issues that could affect CRS policies, in particular.

involves the input of economists, political philosophers, ethicists, business people, finance people and development economists. We need the whole programme."

When considered on a global scale, even a small breakthrough, such as the acceleration of the 'root hair' gene, could have an enormous impact across a life cycle.

ARTICLE REFERENCES

Oxford Martin School

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