Vertical farms advocated to feed cities

Dickson Despommier is a professor in the Mailman School of Public Health at Columbia University. He got interested in scientific literacy from being interested in the process of science and its basis in observation. In effect, he says, people develop their own scientific literacy from the observations they make -- and this is how Despommier facilitates his students' acquisition of their own scientific literacy.

Medicine, he points out, is not a science but rather the art of medical practice. We tell medical students that half of what we tell them isn't true – but we don't know which half. In his presentation to the Scientific Literacy Seminar at the Columbia University Faculty House on 5 December 2006, Despommier noted that medical students require preparation to treat individual patients. But the mission of public health is to prepare to treat large numbers of people *en masse*.

One of the problems of public health is the eradication of hunger, and this is the problem Despommier poses to his students -- as a response to Rene Dubos' admonition to "think globally, but act locally." His first idea was rooftop gardening, but a city's rooftops turned out not to be able to sustain the city's population.

So instead he turned to farming on each floor -- of buildings that were otherwise not being used. Despommier called the result a Vertical Farm and found that a 30-story building covering a city block could feed 50,000 people. He pointed out that, in addition to feeding the inhabitants of cities, vertical farming offered many advantages over the practices of our present agricultural system:

• Vertical farms can produce food year-round, without succumbing to the risks of weather, disease, and pests.
• With pests eliminated, vertical farms can grow food without artificial chemicals and will produce no agricultural runoff which presently contaminates our fresh water.
• Vertical farms would reduce the incidence of infectious diseases caused by organisms nourished by human feces used for fertilizer.
• Vertical farms would purify water as well as grow food (here Despommier cited the "living machine" developed and described by John Todd in his Rodale Lecture on 22 January 1994 at the Ninth Annual Science, Technology and Society Meeting).
• Vertical farms produce methane from composting nonedible parts of plants and animals and avoids the present use of fossil fuels for plowing and shipping.
• Vertical farms, able to produce food as it is needed, eliminate the need for storage and the waste of spoilage.
• Vertical farms create sustainable urban centers.
• Vertical farms, being more labor intensive, will increase employment.

Vertical farms could also be used to grow biomass as an alternative energy source, could reduce the risk of armed conflict over land and water resources, and would also allow present farmland to return to its natural state, thereby reducing carbon dioxide emissions responsible for increased

global warming. It is also something we must master, Despommier said, if we are planning to colonize space: we cannot live in outer space without first learning to farm intensively on Earth.

Like all new attractive developments, though, vertical farms would not come without cost. Although there would eventually be economies of scale, Despommier estimates that the first one would cost $18 billion. You can learn more about the Vertical Farm Project at <http://www.verticalfarm.com>.