

DAILY BREAD

“Grain of Hope : Slice of Heaven”

HEAVEN & EARTH

“The universe employs both push and pull mechanisms to coax the new plant into achieving its vertical potential”

The sun-seeking shoot-tip rapidly generates auxin which flows throughout the plant switching genes on and off and triggering cell growth. The plant is drawn upwards, pulled against the immense force of gravity towards the light.

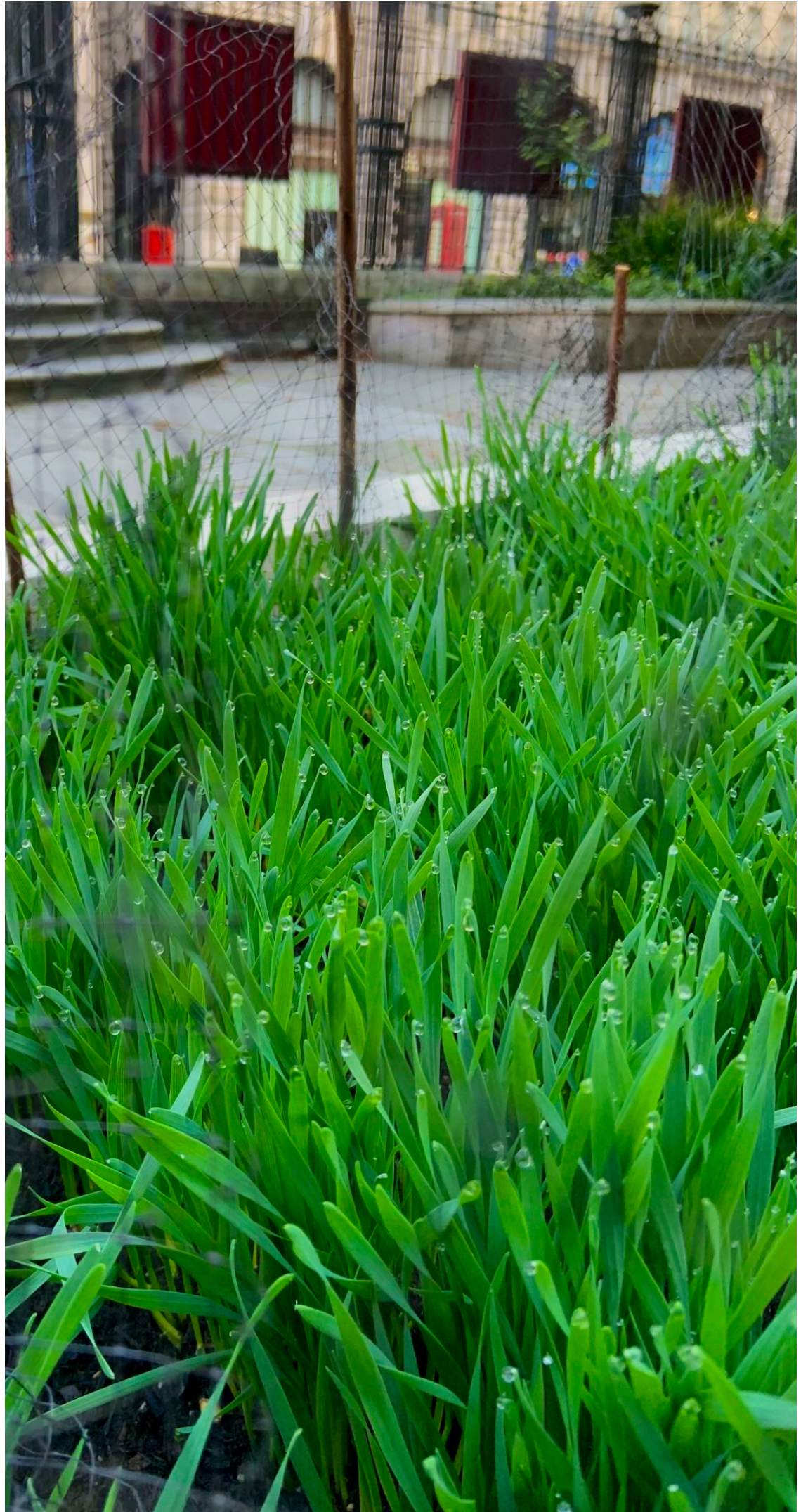
At night, without the stimulus of light, the green parts rest, but the subterranean engine of root pressure swings into action. Water moves silently from soil into root, causing expansion of root cells. Because the walls of these cells are rigid, they push back, forcing a pulse of water into the stem. Then relax, and repeat.

A small heartbeat, pushing water and organic molecules up the stem. Unlike an animal circulation, the system is open at the top. By the morning so much liquid has accumulated that it emerges from a specialised hydathode at the tip of the shoot.

This is guttation, and the droplet is sweet and protein-rich.

The size of this root pressure?

Up to 0.6MPa, or the equivalent of 6 earth atmospheres pushing upward.



“A small heartbeat,
pushing water and
organic molecules
up the stem.”

The wheat growing in our courtyard on Easter Day, 28 days after planting.
Note the guttation at the end of the leaves!



St James's Church
197 Piccadilly
London
W1J 9LL

