

activated the speakers high in the trees, we were surprised to find that inquisitive wrens appeared, seemingly chirping along. We hope that the effects on wildlife are transient; each installation should be brief enough to have no lasting impact.

You have also created an installation about the weather. How does that work?

Variable 4 is an eight-speaker outdoor installation that translates weather conditions into musical patterns. It uses sensors to track temperature, humidity, wind, rain and sun. The weather acts as a kind of virtual conductor, with custom software using real-time data to generate harmonic structures. The installation has toured UK locations selected for their wild and unpredictable weather, including Dungeness in Kent, which has been designated a Site of Special Scientific Interest for its unusual geology and ecology. The next edition of *Variable 4* can be heard from 5 to 14 September in Portland, Dorset.

What about your work with genetic transfer in bacteria?

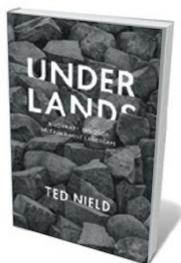
That came out of time I spent with computational biologists at the National Institute for Medical Research in London. They were investigating how bacteria swap genetic information with their neighbours through a mechanism called plasmid exchange. In my 2011 installation *Horizontal Transmission*, sounds in the gallery are detected by a microphone and transformed into 'sonic chromosomes', which are assimilated into the behaviour of a virtual bacterial population. Visitors can navigate through the population using a three-dimensional control interface, exploring cellular dynamics and communication patterns.

How has Twitter inspired you?

The Listening Machine was a collaboration with cellist Peter Gregson, created with the Britten Sinfonia chamber orchestra. At its heart was an automated system that continuously generated music based on the real-time activity of a few hundred UK Twitter users. Linguistic software analysed their tweets for sentiment, rhythms of speech and subject matter, and translated them into musical patterns using orchestral fragments representing, for example, phonemes — distinct units of pronunciation. The resultant composition could be heard live through any web-connected device. It ran for nine months starting in May 2012, with a daily rhythm that reflected the real rhythms in a communicating society: peaks of musical density at rush hour and sparse, reflective periods late at night. ■

INTERVIEW BY JASCHA HOFFMAN

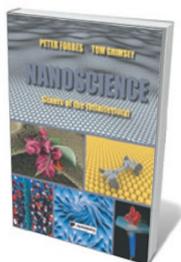
Books in brief



Underlands: A Journey Through Britain's Lost Landscape

Ted Nield GRANTA BOOKS (2014)

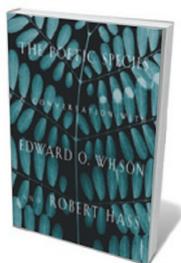
"We must get under the skin of the land" to understand a country, avers geologist Ted Nield. In this magisterial homage to Britain's geology — once the bedrock of mining industries that enriched the country's coffers and culture — Nield extracts a wealth of stories from the stones. Around broad areas such as geological formation, quarrying and stone-working, he layers a narrative that mixes memoir, science and industrial history. Studded with delights, such as the discovery of basalt's volcanic origin by eighteenth-century 'rogue' Rudolph Erich Raspe — author of the Baron Munchausen tales.



Nanoscience: Giants of the Infinitesimal

Peter Forbes and Tom Grimsey PAPADAKIS (2014)

Lucid text and visuals combine to dazzling effect in this introduction to nanotechnology by science writer Peter Forbes and sculptor Tom Grimsey. The field's godfather, they remind us, was physicist Richard Feynman, whose seminal 1959 lecture 'There's Plenty of Room at the Bottom' posited the idea of engineering at the molecular scale. The authors tour the evolution of the discipline, from studies tracing how components self-organize, to nanomaterials such as graphene and aquaplastics (polymers that are 97% water), nano-templated stem cells, quasicrystals and much more.



The Poetic Species: A Conversation with Edward O. Wilson and Robert Hass

BELLEVUE LITERARY PRESS (2014)

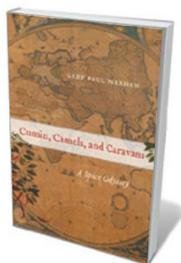
The principle of consilience, or the unity of knowledge, infuses this conversation between biologist E. O. Wilson and poet Robert Hass, organized by New York institutions the American Museum of Natural History and Poets House. The eminent duo explore echoes and parallels in their respective fields with eloquent concision, from Wilson's advice to poets ("Colonize science") to Hass's musings on the interplay of selfish gene and social imperative in imagination.



The Duchess's Shells: Natural History Collecting in the Age of Cook's Voyages

Beth Fowkes Tobin YALE UNIVERSITY PRESS (2014)

How do you study a long-dispersed collection? Scholar Beth Fowkes Tobin faced this curious challenge when delving into the story of eighteenth-century conchologist Margaret Cavendish Bentinck, duchess of Portland. Bentinck's shell collection was the era's largest, yet she died before completing her scientific catalogue, and the lot was sold off. Tobin's feat of historical retrieval reveals the duchess as a field collector generous with funds and findings, preventing yet another 'burial at sea' of a historically important female scientist.



Cumin, Camels, and Caravans: A Spice Odyssey

Gary Paul Nabhan UNIVERSITY OF CALIFORNIA PRESS (2014)

Globalization began not with Christopher Columbus in 1492, as many suggest, but with unknown Arabic and Jewish spice traders centuries before. So argues agricultural ecologist Gary Paul Nabhan in this heady historical and cultural study of ancient trade routes including the Silk Road, the 'information highways' of old. Centring his discussion on commodities such as frankincense, Nabhan adds pungent pinches of botany and gastronomy, such as a 3,700-year-old recipe incorporating lamb, yogurt, cumin and blood. *Barbara Kiser*