Archaeology
Historical Geography
and the Data Deluge

Andrew Bevan
14 October 2016
underground, overground, largely digital, frequently spatial, increasingly open, sometimes social and often remotely sensed.
Remote Sensing
Revolutions
Large-scale, 3D, canopy-busting, time-sliced, multivariate, worldwide
Revenge of the Ordinary Photo
Structure from Motion/Multi-view Stereo (‘3D Photogrammetry’)

[Images of various objects and scenes related to 3D photogrammetry and structure from motion.]
Systematic Serendipity

Radiocarbon dates as data
- Democratised locations (smartphones, GPS, Google Earth)
- Open access publications
- Open data (archived properly, liberally licensed and online in raw form)
- Open source software (that everyone can use freely and some can interrogate in depth and/or modify)
- Reproducible methods (exact analytical workflows on known datasets)
Citizen Science & Citizen Humanities

http://crowdsourced.micropasts.org
Crowd and Community-Fuelled
http://crowdsourced.micropasts.org

Community Leaderboard

<table>
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<tr>
<th>Rank</th>
<th>Name</th>
<th>Score</th>
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<tr>
<td>1</td>
<td>Joellen McIlwain</td>
<td>19693</td>
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<td>Denis Antoine</td>
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<td>Maria Christakou</td>
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<td>Susan Magarvody</td>
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<td>Michael George Adams</td>
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<td>Hugh Fiske</td>
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<td>MARIA WALCOTT</td>
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<td>Elaine Dave</td>
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<td>M. Froo</td>
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<td>Denis Fatholle</td>
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Metal-shocked

UK Portable Antiquities Scheme (https://finds.org.uk/)

1,168,780 objects within 738,166 records.
The Data Rich and the Data Poor

Local biases, global asymmetries and their consequences
Computational Approaches

Bias Management, Sensitivity Modelling, Long-term Change, Dispersal Mechanisms, Human Experience, Exogenous and Endogenous Effects

“I begin...”
Adversarial Archaeologies

- Egyptian-style travertine vessels (n=361)
- Mycenaean-style pottery (n=879)

Fragments per hectare

- Centre Ville (ca.1500 m²)
- Palais Royal (ca.7000 m²)
- Palais Sud (ca.1250 m²)
- Linet Sud (ca.250 m²)
- Ville Basse (ca.5250 m²)
- Quartier Nord-Ouest (ca.7500 m²)
- Quartier Residential (ca.8500 m²)
- Ville Sud (ca.18500 m²)
- Sud Acropole (ca.15800 m²)

50 km

Map showing distribution of artifacts.
Qin Shi Huang
259-201 BC (221 BC unification)
Individualism and Morelli’s Ears

Bevan, Li, Martinon-Torres et al 2014 Journal of Archaeological Science
Diversify or Homogenise, Store or Redistribute

Surplus, Savings and Risk
Bronze Age Beginnings

The birth of amphoras: bulky, beautiful and branded

ca. 1600-1200 BC

Cultures of Commodity Branding

3rd/early 2nd millennium BC
A Mediterranean Lake
Phoenician and Greek containers (1st millennium BC)
Monte Testaccios (real and typological) Roman containers

Suggested Primary Contents
- wine
- olive oil and olives
- fish products
- mixed or unknown

100 cm
Containerised Culture
Ethnic identity, civil discipline and mundane re-use
We do these things in jest and not in earnest… so that, once a year, the foolishness innate in us can come out and evaporate. Don’t wine skins and barrels bust very often if the air-hole is not opened from time to time? We too are old barrels (French clerics in 1444)
Intensive Archaeological Surface Survey
Lessons from the Recent Past
Lessons from the Deep Past

ca. 5000-3000 BC
Lessons from Minos?

Middle/Late Bronze Age (1900-1400 BC)
Piratical Positions
Hellenistic (325-67 BC)
Comparative Settlement Models
Concentration and Dispersal
Settlement Structure and Landscape Capital

AD 1780-1950 (pottery finds)
ca.325-67 BC (pottery finds)
Political Geography and Settlement Hierarchy

Minoan Crete (1900-1400 BC)

Bevan and Wilson 2013 J. Archaeological Science
Iteration 50

Iteration 300

Iteration 750

Path and Place Hierarchies
Population structure and economy

Domesday ‘population’ (AD 1086)

Domesday period silver coins

Bevan 2012 Antiquity
Mediterranean Coastal versus Inland Population Dynamics via Summed Radiocarbon

Plymouth/UCL Leverhulme project (ongoing)
Concentrations and Dispersals of Human Capital
People, Landscapes and Material Culture
Harnessing the Data Deluge