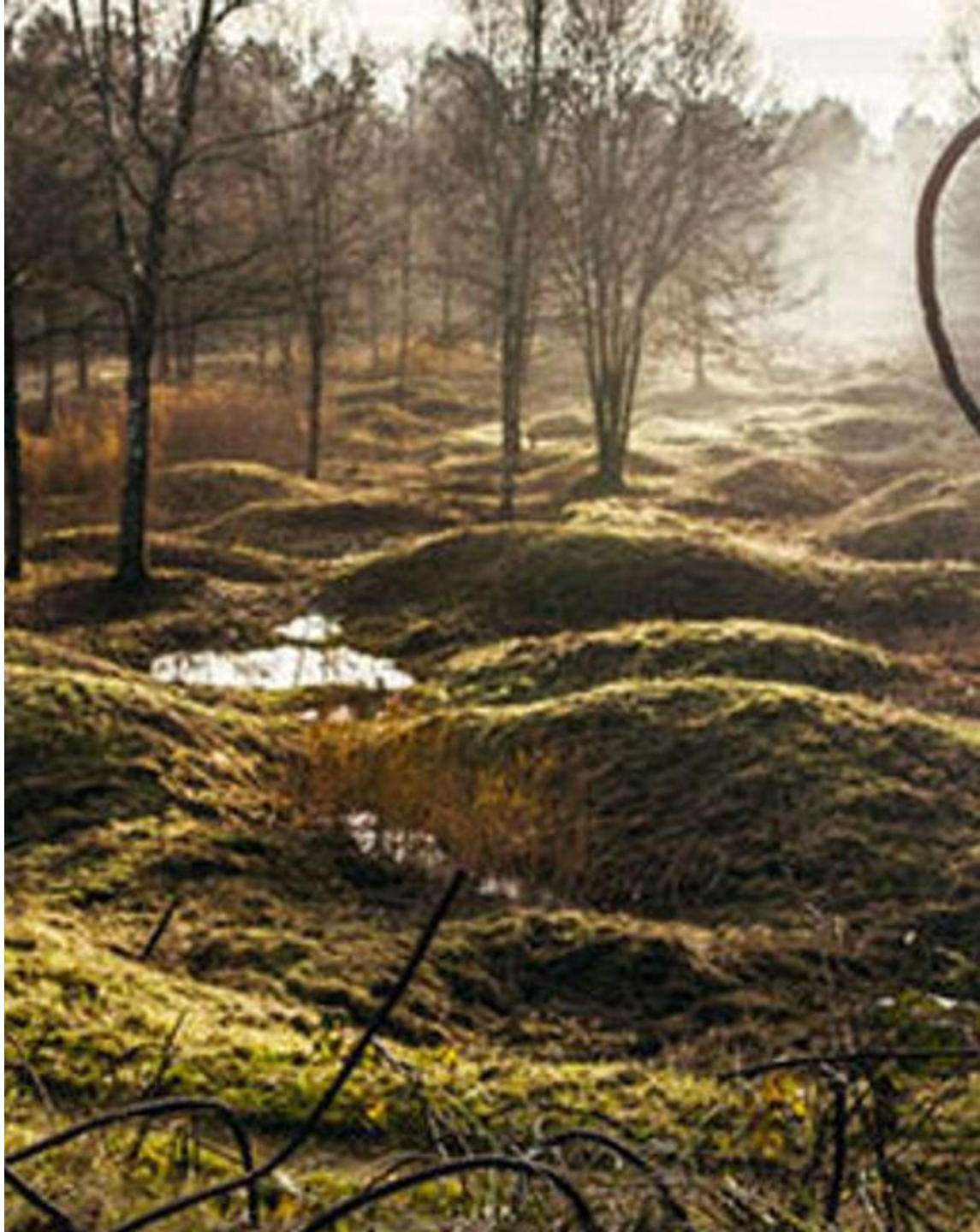
P&D Conference 2026 · Prague · 15–17 October

Verdun and the Somme After the Battles

Why a century of research has not produced an integrated morphology of military contamination

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PROBLEM

A well studied object without an integrated object

100+

years of research

- Military history reconstructs operations and chronology
- Archaeology and geophysics recover buried material and spatial organisation
- Geomorphology, soil science and toxicology resolve environmental processes
- Heritage, forestry and mine action define other legitimate objects

Knowledge accumulates. The causal unity of the process remains weakly represented.

THEORY

Two durations of warfare

OPERATIONAL DURATION

Defined by military chronology

Verdun
February–December 1916

Somme
July–November 1916

MATERIAL DURATION

No comparable terminal date

Corrosion and chemical transformation
Redistribution through water and soil
Vegetation and land use change
Repeated human encounter

Historical closure and environmental closure belong to different temporal systems.

THEORY

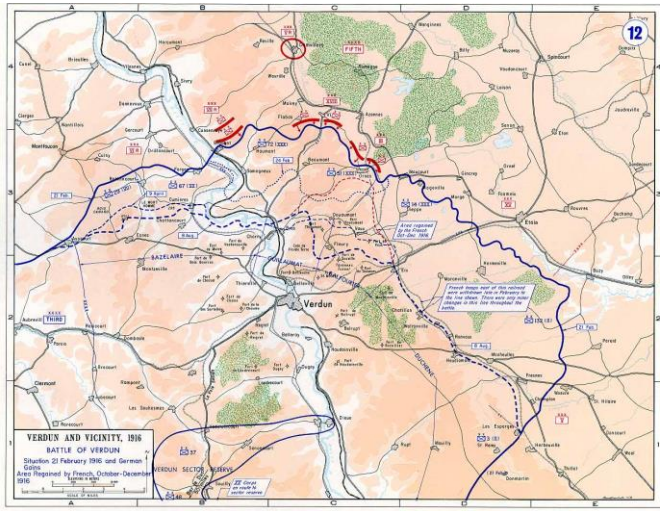
Transformation can hide persistence

A military object may disappear while its material consequences become more distributed and harder to recognise.

FRAGMENTATION	Shell casing, explosive and soil become a mixed material system
CORROSION	The object loses its visible form while releasing new compounds
REDISTRIBUTION	Water, erosion, roots and cultivation move material across space
CONCENTRATION	Clearance and disposal can gather diffuse hazards in one place
RE-ENCOUNTER	Later land use makes a formally closed hazard visible again

METHOD

Comparative reconstruction from 1916 to the present





Analytical task

- Trace changes in the expert object
- Separate direct conflict effects from postwar management effects
- Identify lost transitions between disciplines and periods
- Test whether fragments form a causal morphology

Evidence base: military history, archaeology, geomorphology, environmental science, mine action and land management

RESULTS

Different landscapes create different knowledge environments



Forest and restricted land preserve conflict-generated topography. Geomorphology, ecology and toxicology gain durable objects.



Agriculture repeatedly disturbs soil. Archaeology, geophysics, remote sensing and civil-protection encounters become prominent.

The known environmental history reflects both material reality and the later organisation of attention.

Postwar management can create a second environmental legacy

Place-à-Gaz · Spincourt forest

Approximately 200,000 arsenical chemical shells were opened and destroyed after the war, mainly through thermal treatment.

Immediate operational result

Explosive munitions removed
The disposal task could be closed

Long term environmental result

Hazardous material concentrated and transformed
Extreme arsenic contamination persisted in soil

Success at one level and continuation at another are compatible.

RESULTS

A century of changing expert objects

1916–1920s

Battle
Casualties
Burial
Clearance

Interwar decades

Reconstruction
Zone Rouge
Afforestation
Memorialisation

Late 20th century

Heritage
Archaeology
Tourism
Mine action

21st century

Geomorphology
Soil processes
Toxicology
Remote sensing

Each stage added knowledge. The common causal object remained deferred.

RESULTS

Specialist success can coexist with a system level blind spot

Military history	Operations and chronology
Archaeology	Deposits and material contexts
Mine action	Explosive risk and land release
Toxicology	Contaminants and exposure
Forestry and heritage	Management and significance

No expert system owns the complete causal chain

The result may be a sum of normalities rather than a sum of errors.

A larger bibliography cannot by itself make different temporal and spatial objects causally comparable.

Four forms of closure do not coincide

HISTORICAL	The battle ends
OPERATIONAL	An intervention completes its assigned task
ADMINISTRATIVE	A site leaves a programme or changes status
ENVIRONMENTAL	The material process ceases, stabilises or falls below concern

An intervention may close historically, operationally and administratively while the environmental process continues.

RESULTS

A provisional morphology of long term military contamination

1
Disturbance

2
Primary transformation

3
Redistribution

4
Institutional intervention

5
Secondary transformation

6
Apparent closure

7
Continuing process

8
Reduced attention

9
Rediscovery

10
Renewed intervention

The sequence is a research proposition. Cases may branch, omit stages or change their order.

Morphology preserves transitions, not only objects.

RESULTS

The missing evidence often lies between expert objects

A causal information architecture would preserve relationships among specialist records.

Event	Material	Location	Intervention
Relocation	Transformation	Exposure	Later management

The task is not to replace specialist databases. It is to make the complete process available for analysis.

KEY TAKEAWAYS

Elapsed time cannot repair a fragmented research architecture

01 The material duration of warfare extends beyond military chronology.

02 Research on Verdun and the Somme has grown through increasingly resolved fragments.

03 Postwar management can transform, concentrate and relocate military contamination.

04 Environmental closure must be distinguished from historical and institutional closure.

05 **Integrated understanding requires a morphology that preserves causal transitions.**

Even a millennium of increasingly precise fragments cannot substitute for reconstruction of causal unity.

DISCUSSION

The question for organised knowledge

Under what conditions can organised knowledge reconstruct the causal unity of a reality that does not respect the boundaries through which knowledge itself is organised?

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Thank you