Supplemental Analysis: Pragmatist and Neo-Materialist Foundations

S3.1 North American Pragmatism and the Calculus of Indications

The Peircean Heritage

Charles Sanders Peirce (1839-1914) developed **Existential Graphs**—a diagrammatic logic that anticipates Spencer-Brown's calculus in fundamental ways. The connection is not merely superficial but structural.

Peirce's Existential Graphs

Peirce's system employs: - **Sheet of Assertion**: The blank page represents truth (cf. Spencer-Brown's unmarked space) - **Cuts**: Closed curves that negate their contents (cf. enclosure) - **Juxtaposition**: Co-presence on the sheet represents conjunction

Peirce's Graphs	Spencer-Brown	Interpretation
Blank sheet	Void	Base state
Cut ( )	Mark $\langle\ \rangle$	Negation/distinction
Double cut	$\langle\langle\ \rangle\rangle$	Double negation $=$ identity
Adjacent graphs	Juxtaposition	Conjunction

William James: Radical Empiricism

James's **radical empiricism** (1904-1912) insisted that relations are as real as the things related. This aligns with boundary logic:

James	Containment Theory
Relations are real	Boundaries are primitive
Conjunctive relations	Juxtaposition
Disjunctive relations	Separation by mark
Pure experience	Void before distinction

James's "stream of consciousness" fragments through distinction; the calculus formalizes this fragmentation.

The Pragmatic Maxim

Peirce's pragmatic maxim: "Consider what effects… the object of our conception has. Then, our conception of these effects is the whole of our conception of the object."

For the mark $\langle\ \rangle$: - **Effect**: Creates inside/outside - **Conception**: The mark *is* distinction itself - **Meaning**: Fully contained in

John Dewey: Inquiry as Distinction

Dewey's **instrumentalism** treats inquiry as the transformation of indeterminate situations into determinate ones—precisely the function of distinction.

Dewey's Inquiry	Boundary Operation
Indeterminate situation	Void
Problematic situation	Recognition of need for distinction
Institution of a problem	Drawing the mark
Determination	Canonical form

Dewey's emphasis on **continuity** (situations flowing into one another) parallels the recursive structure of nested boundaries.

Experience and Nature

"To exist is to be in a situation…" — Dewey

To be distinguished *is* to exist. The mark creates existence from the void. Dewey's naturalism grounds this in biological and cultural practice: organisms survive by making effective distinctions.

S3.2 Process Philosophy and the Mark

Alfred North Whitehead

Whitehead's **process philosophy** provides metaphysical grounding:

Actual Entities

Whitehead's **actual entities** are the final real things: - Each actual entity *becomes* through **prehension** (grasping others) - The void corresponds to **eternal objects** (pure potentiality) - The mark corresponds to **actualization** (becoming definite)

Whitehead	Containment Theory
Creativity	The capacity for distinction
Eternal objects	Void (potentiality)
Actual entities	Marked forms
Prehension	Enclosure (taking in)
Concrescence	Reduction to canonical form

The Category of the Ultimate

Whitehead's three notions: 1. **Creativity**: The ultimate principle of novelty 2. **Many**: The disjunctive diversity of the universe 3.

S3.3 Neo-Materialism and Agential Realism

Karen Barad: Intra-action

Karen Barad's **agential realism** reconceives the relationship between observer, observed, and observation. The boundary is not between pre-existing entities but constitutive of entities.

Intra-action vs. Interaction

Traditional View	Barad's Agential Realism	Containment Theory
Entities interact	Entities intra-act	Forms compose
Boundaries pre-exist	Boundaries enacted	Mark creates boundary
Observer separate	Observer entangled	Self-reference (imaginary values)

Agential Cuts

Barad's **agential cuts** determine what becomes determinate:
> *"It is through specific agential intra-actions that the boundaries and properties of the 'components' of phenomena*

Donna Haraway: Situated Knowledges

Haraway's **situated knowledges** reject the "god trick" of seeing everything from nowhere:

God Trick	Situated Knowledge	Boundary Logic
View from nowhere	View from somewhere	View from inside/outside
Unmarked observer	Marked observer	Observer as form
Neutral	Positioned	Self-referential

The imaginary value $j = \langle j \rangle$ formalizes the observer observing itself—a situated, recursive position.

S3.4 Deleuze and Immanence

Difference in Itself

Gilles Deleuze's **philosophy of difference** resonates with distinction-as-primitive:

Representational Thought	Deleuze	Containment Theory
Identity primary	Difference primary	Distinction primary
Difference = not-same	Difference in itself	Mark creates difference
Categories fixed	Categories produced	Forms reducible

The Virtual and the Actual

Deleuze's **virtual/actual** distinction maps onto void/mark:

Deleuze	Spencer-Brown	Character
Virtual	Void	Real but not actual
Actualization	Mark-making	Determination

Intensive Differences

Deleuze's **intensive quantities** (differences that don't divide without changing nature) relate to depth in boundary logic:

- ▶ Depth = intensive magnitude
- ▶ Flattening (reduction) changes nature
- ▶ $\langle\langle a \rangle\rangle \neq \langle a \rangle \neq a$ intensively

S3.5 Brian Massumi and Affect

Affect and the Virtual

Massumi's **affect theory** treats intensity as prior to formed content:

Massumi	Containment Theory
Affect (intensity)	Void (potential)
Emotion (qualified)	Form (structured)
Passage	Reduction
Autonomy of affect	Resistance to reduction

Irreducible forms (already canonical) resist further passage—they are "stuck" affects.

Ontopower

Massumi's **ontopower**: power operating at the level of emergence.

The capacity to make distinctions *is* ontopower—the capacity to create realities by differentiating the undifferentiated.

S3.6 New Materialism and Matter's Agency

Vibrant Matter (Jane Bennett)

Jane Bennett's **vital materialism** attributes agency to matter itself:

Bennett	Boundary Logic
Actants	Forms as actors
Assemblages	Juxtapositions
Thing-power	Reduction capacity

Forms are not passive representations but active participants in reduction—they *do* things.

Material Semiotics (ANT)

Actor-Network Theory's **material semiotics**: - Signs and things are equally actors - Networks are heterogeneous assemblages - Translation transforms identities

The calculus of indications is maximally material-semiotic: the notation (material marks) *is* the logic (semiotic structure).

S3.7 Synthesis: Pragmatist-Materialist Containment

Core Commitments

From these traditions, Containment Theory inherits:

1. **Anti-representationalism** (Pragmatism): Forms don't represent; they enact
2. **Relational ontology** (Neo-materialism): Boundaries constitute entities
3. **Process primacy** (Whitehead): Becoming precedes being
4. **Situatedness** (Haraway): Observer within system
5. **Difference primacy** (Deleuze): Distinction before identity

The Mark as Pragmatic-Materialist Primitive

The mark $\langle \ \rangle$ unifies: - **Pragmatist**: Operational definition (effects = meaning) - **Materialist**: Physical inscription (matter makes marks) - **Processual**: Temporal act (distinction happens) - **Relational**: Creates relations (inside/outside)

Research Program

This philosophical grounding suggests:

1. **Experimental Pragmatism**: Test forms by their consequences
2. **Material Practice**: Implement forms in physical media
3. **Processual Analysis**: Study reduction as temporal unfolding
4. **Ecological Thinking**: Forms in environments of other forms

S3.8 Key Texts and Lineages

North American Pragmatism

Author	Key Work	Connection
C.S. Peirce	*Collected Papers* (1931-58)	Existential graphs, icons
William James	*Essays in Radical Empiricism* (1912)	Relations as real
John Dewey	*Logic: The Theory of Inquiry* (1938)	Inquiry as distinction
George Herbert Mead	*Mind, Self, and Society* (1934)	Self-reference
Richard Rorty	*Philosophy and the Mirror of Nature* (1979)	Anti-representationalism
Robert Brandom	*Making It Explicit* (1994)	Inferential semantics

Process Philosophy

Author	Key Work	Connection
A.N. Whitehead	*Process and Reality* (1929)	Actual entities, creativity
Charles Hartshorne	*Creative Synthesis* (1970)	Panexperientialism
Isabelle Stengers	*Thinking with Whitehead* (2011)	Speculative philosophy

Neo-Materialism

Author	Key Work	Connection
Karen Barad	*Meeting the Universe Halfway* (2007)	Agential cuts
Donna Haraway	*Staying with the Trouble* (2016)	Situated becoming
Jane Bennett	*Vibrant Matter* (2010)	Thing-power
Rosi Braidotti	*The Posthuman* (2013)	Affirmative ethics

Continental Connections

Author	Key Work	Connection
Gilles Deleuze	*Difference and Repetition* (1968)	Difference in itself
Brian Massumi	*Parables for the Virtual* (2002)	Affect, intensity
Gilbert Simondon	*Individuation* (1958)	Transduction
Bruno Latour	*We Have Never Been Modern* (1991)	Actor-networks