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Two New Gestures on Peirce's Continuum and the Existential Graphs: Plurality of Pragmatic Imagination

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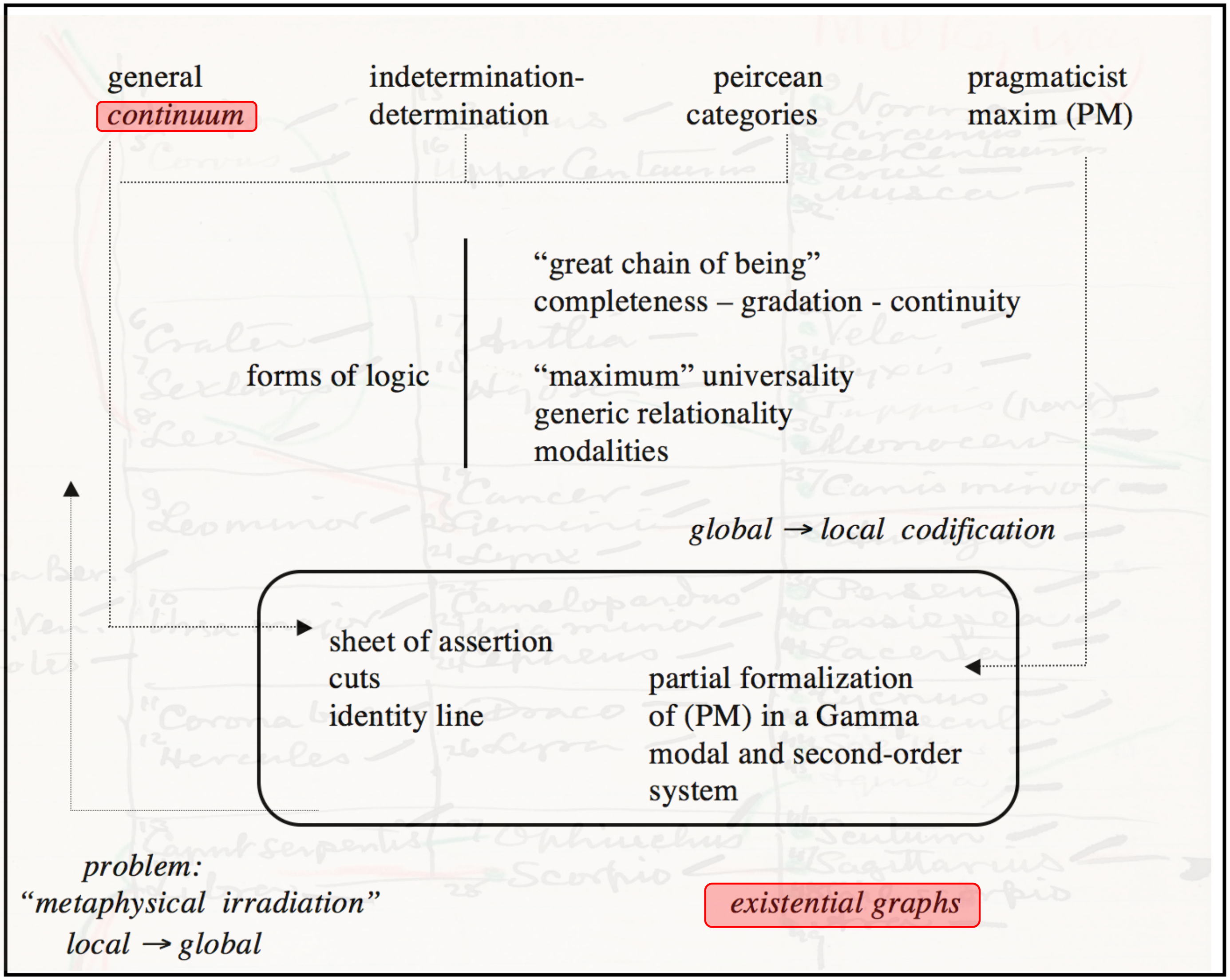
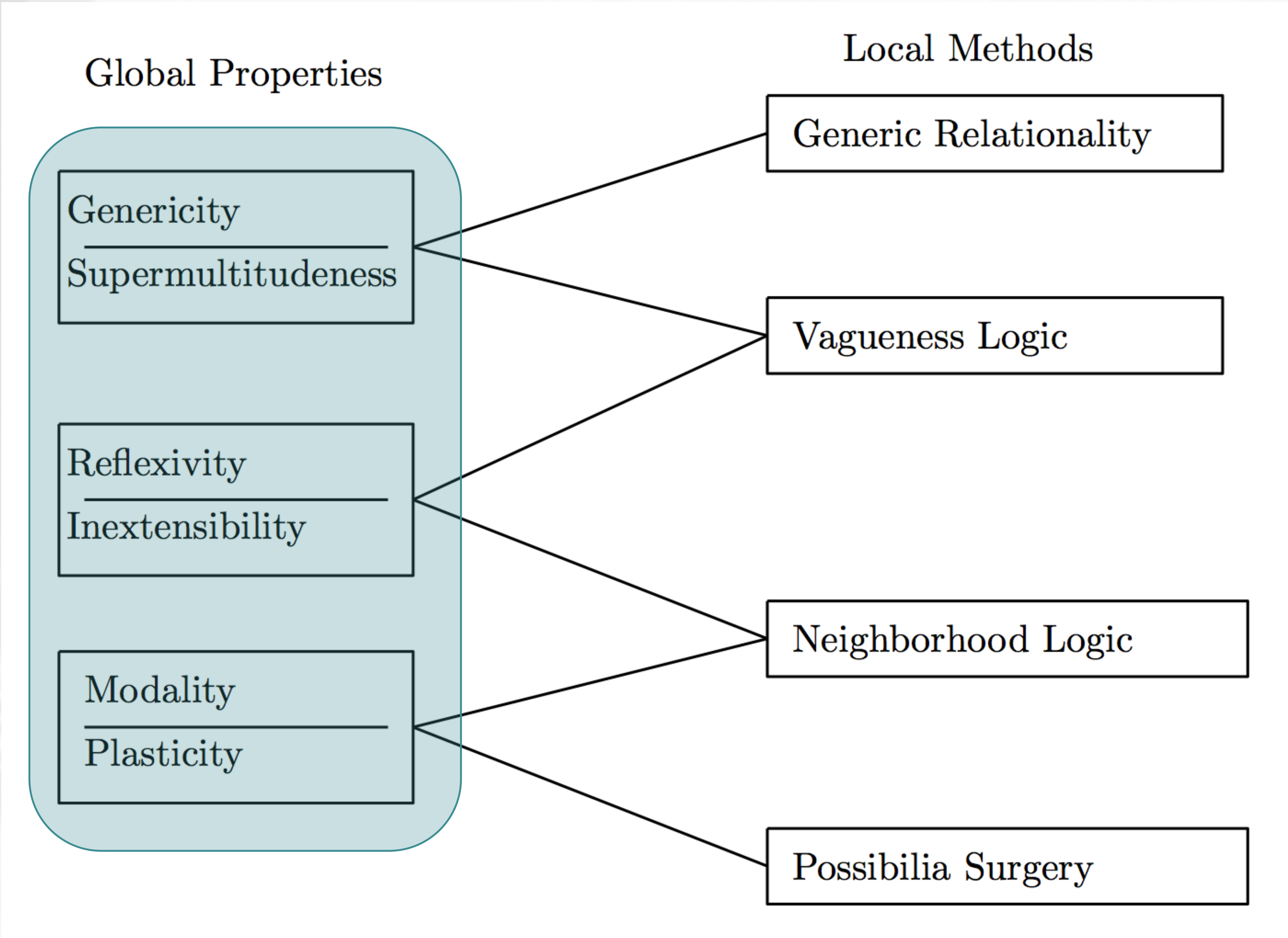
1. Unfolding Architectonics

1.2. The General System



1. Unfolding Architectonics

1.3. Peirce's Continuum



1. Unfolding Architectonics
1.4. Peirce's Existential Graphs

1. Signs.

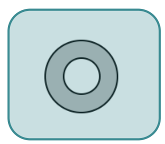
Sheet of assertion:	blank generic sheet.	Icon:	
Cuts:	generic ovals detaching regions in the sheet of assertion.	Icons:	(Alpha) (Gamma)
Line of identity:	generic line weaving relations in the sheet of assertion.	Icon:	(Beta)
Logical terms:	propositional and relational signs marking the sheet of assertion.	Icons:	p, q, ... R, S, ...

2. Illative Transformations of Signs.

Detaching Properties ("information zones").

Cuts can be nested but cannot intersect.
Identity lines can intersect other identity lines and all kinds of cuts.

Double cuts Alpha can be introduced or eliminated around any graph, whenever in the "donut" region (gray) no graphs different from identity lines appear.



Transferring Properties ("information transmission").

Inside regions nested in an even number of cuts (Alpha or Gamma), graphs may be *erased*.
Inside regions nested in an odd number of cuts, graphs may be *inserted*.
Towards regions nested in a bigger number of cuts, graphs may be *iterated*.
Towards regions nested in a lower number of cuts, graphs may be *deiterated*.

3. Interpretation of Signs and Illative Transformations.

Blank sheet:	truth
Alpha cut:	negation
Juxtaposition:	conjunction
Line of identity:	existential quantifier
Gamma cut:	contingency (possibility of negation)
Double cut:	classical rule of negation $(\neg\neg p \leftrightarrow p)$
Erasure and insertion:	minimal rule of conjunction $(p \wedge q \to p$ and $\neg p \to \neg(p \wedge q))$
Iteration and deiteration:	intuitionistic rule of negation as generic connective $(p \wedge \neg q \leftrightarrow p \wedge \neg(p \wedge q))$

• axioms: (ALPHA) (BETA) wider choices (GAMMA)

• *calculi*:

ALPHA	≡	Classical propositional calculus
BETA	≡	Purely relational first-order logic
GAMMA_{I}	≡	Intermediate modal logics
GAMMA_{II}	⊇	Second-order logic.

1. Unfolding Architectonics
1.5. Arborescence

Peirce

(Fisch)

Murphey Roberts Zeman

Herron Lane

Burch

Ehrlich Moore Maddalena Brady & Trimble

Pietarinen

Havenel McCurdy

Atarashi Pavlov

FZ

Vargas Oostra

line of identity to be thoroughly studied

CONTINUUM ——— EXISTENTIAL GRAPHS

names legend

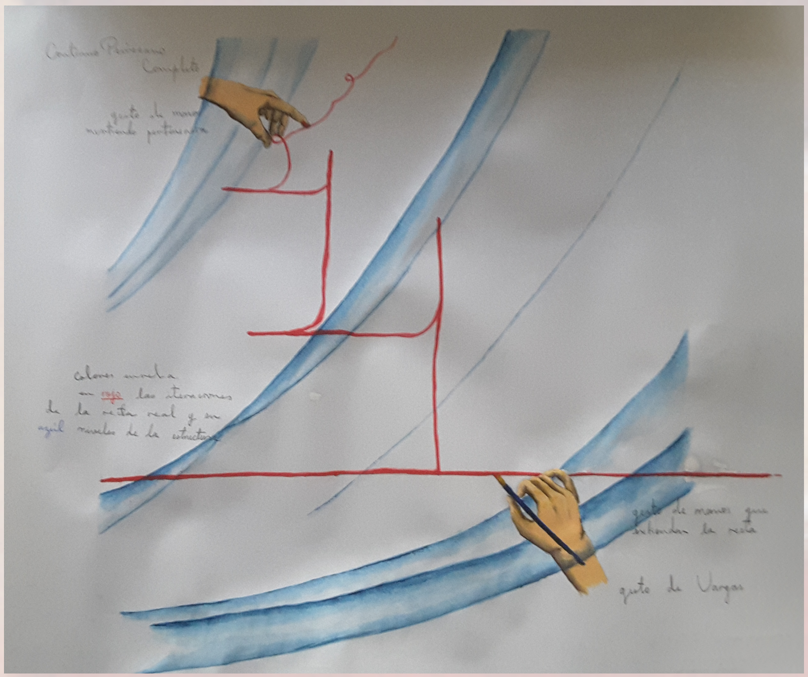
in black, scholars on Peirce, in blue, scholars beyond Peirce, in red, the deepest developments so far

2. Two New Gestures

2.1. Vargas: Complete Model for Peirce's Continuum

Francisco Vargas [2013/2017]

the simplest (and deepest) model for Peirce's continuum



[Angie Hugueth 2017]

Definition 2.1. *For $\alpha \in Ord \setminus \{0\}$ let $\langle \mathcal{C}_\alpha, <_\alpha \rangle$ be defined as the set of $\alpha-$real sequences with the lexicographical order.*

Definition 2.3. *let $\langle \mathcal{C}_{Ord}, <_{Ord} \rangle$ be defined as*

- $\mathcal{C}_{Ord} = \bigcup_{\alpha \in Ord} \mathcal{C}_\alpha$
- *For any $x, y \in \mathcal{C}_{Ord}$ we define $x <_{Ord} y$ iff, for $\alpha = min(dom(x), dom(y))$, $x \restriction \alpha <_\alpha y \restriction \alpha$*

Definition 2.4. *For $x, y \in \mathcal{C}_{Ord}$ we have that xEy iff $dom(y) < dom(x)$ and $x \restriction dom(y) = y$*

Definition 2.5. *For $x \in \mathcal{C}_{Ord}$ let $\mathcal{M}_x$, the monad associated to x, be defined as the class of elements $y \in \mathcal{C}_{Ord}$ such that yEx.*

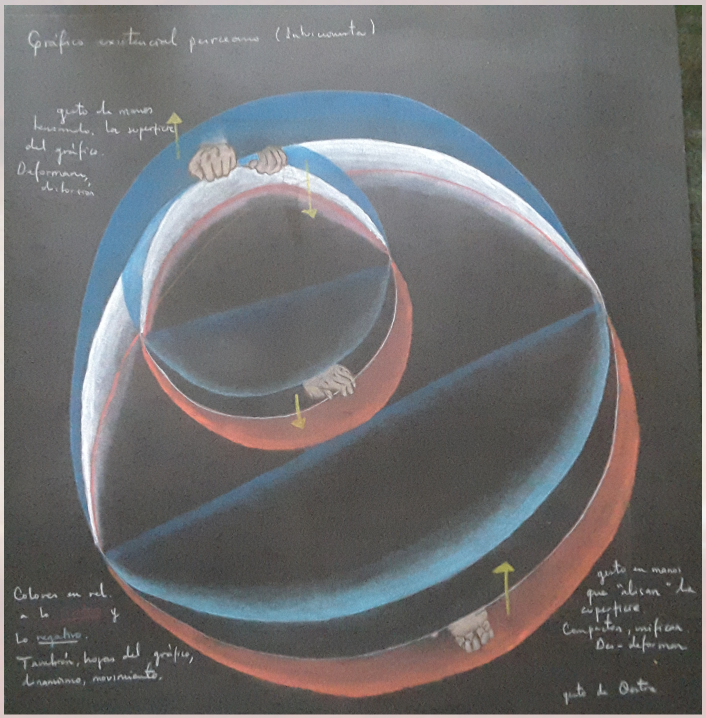
Theorem 2.6. *For any $x \in \mathcal{C}_{Ord}$*

$$\langle \mathcal{M}_x, <_{Ord}, E \rangle \simeq \langle \mathcal{C}_{Ord}, <_{Ord}, E \rangle$$

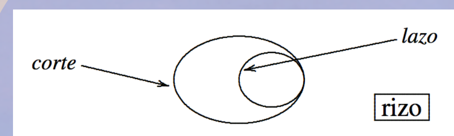
2. Two New Gestures
2.2. Oostra: Intuitionistic Existential Graphs

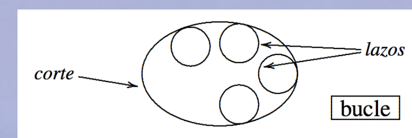
Arnold Oostra [2007/2011]

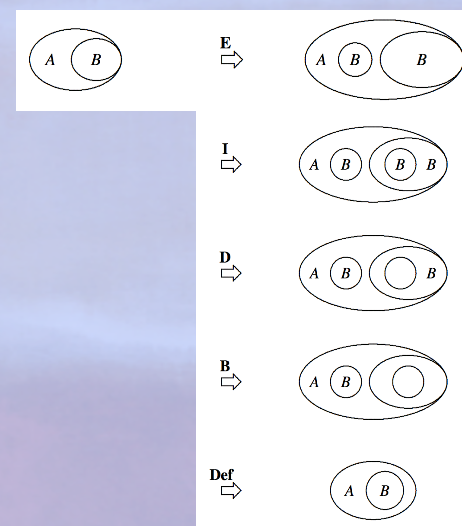
the simplest (and deepest) enlargement of the EG



[Angie Hugueth 2017]







intuitionistic existential graphs: a true topological logic

3. Plurality (Multidimensionality) of Pragmatic Imagination