‘LoF26 Jack Engstrom’s Supplementary-paper Aug8 final’.

Jack Engstrom’s **Supplementary paper** for Laws of Form Conference LoF26, Cambridge U.K., August 10, 2026

Title:

Laws of Form and the emergence-from-void of forms and properties and existences:

Typographical Note: I sometimes bind words into unit-phrases by connecting them with a dot/period‘.’ e.g. LoF.cross.

Abstract:
Laws of Form shows us an “x-ray” into emergence-in-layers of forms and properties and existence from no-form.
Distinctions emerge in LoF from void and unmarked, to "condensed-entities" as precursors-from-which distinctions and properties become generated, terminating in physical-existences.
0) Example#0: VoidthinBoundaries precede the LoF.cross.Mark, and have some of its semiotic.properties. (See Engstrom 2017, & Engstrom 2023, C.2., D.2b.)
1) Emergence-from-seed: The construction of LoF’s right.angle.cross⏋ gives a condensed-entity where cardinal.1 is-condensed-with ordinal.1, and where concave.side≠convex.side, from-which:
operand.noun is.distinct.from operator.verb; severance≠division; and later: ⏋ as a form indicating marked.state and an.equivalence.class of values; then re-interpreted as Boolean.1, then as value:true, and as implication.template, and as validity, …and later as theNonBoolean.cardinal.number.1.
We thus have successive layers of indication and properties and knowledge.
2) Example of interplay-of-layers of perception and interpretations: See Preface B in Engstrom 2023: LoF.expression‘emptyCross⏋ juxtaposed.with.unmarked’ interprets as ‘F.ply.F = T’ (in Part.IIc of Engstrom 2023, pages 619-620).
3) An example of material.existences (“earth”) emerging out of nonexistence/emptiness (“air”) is: From the LoF.notational.representation of the syllogism Barbara as condensed.archetype, eight valid all-universal- and sixteen valid existential-syllogisms can be derived using transposition and C1 reflexion and negation (ThankYou Lou Kauffman).
4) Another example of “earth” emerging out of “air” is: theSuperstructure of nonidem.integraldomain.numerical.polynomials emerges out-of (or “on top of”) the infrastructure of idempotent Boolean.polynomials.

Details:

1) Emergence-from-seed:

A. LoF

• The construction of LoF's right.angle'cross'line.mark⏋ shows the.distinction: concave.side≠convex.side.

• When this line.mark is copied into LoF's initially-unmarked planar arrangement.space, it not-only marks it but also severs the unmarked plane to produce a *two*.part-unit: the *empty*.cross as an abbreviation of an empty.rectangular.perimeter.

• This empty.cross becomes a unit.expression (a noun) indicating (as a verb calling) the.marked.state. As two(actually.three)part-unit, 'the *voidthin.boundary*-between the.unmarked.inside and the.line.mark⏋ .immediately.Outside' *cross|es*(verb/act) from the.unmarked.state to the.marked.state (in pre-notation).

• TheFirstDistinction distinguishes the.unmarked.state from the.marked.state. The.unmarked.state and the.marked.state become the Only-two values of the primary.arithmetic.

• Arrangement.space stipulates-that all marks in it be mutually-continent (not-touch and be either inside or outside every other mark). An example having letter.marks and crosses (here as rectangles) is $\boxed{A\boxed{B}}$ *vs*. ' $\boxed{A}\ \boxed{B}$ '.

Mutual-continence *forces*-that a second right.angle'cross'line.mark must be either 'juxtaposed-Outside' or else 'in-a-nesting-relative-to' the first. These Only.two possible arrangements-of-two-crosses (juxtaposed *vs*. nested) are two distinct expressions that preserve the inequality(≠) in TheFirstDistinction.

• The two visual-(graphic)forms of the only-two arrangements-of-two-crosses (juxtaposed vs. nested) visually-*show* the meaning of cardinal.two vs. *ordinal*.two, respectively. R.Carnap states-that cardinality is the.simplest-structure, i.e. ordinals (successors) have additional-structure.

Cardinal.two(juxtaposed)crosses standing in a depth.zero-space create two depth.one-spaces, and have-*divided*-into-two the-original-depth.one-space.

An *ordinal.two*crosses-arrangement standing in a depth.zero-space *severs* depth.2 from depth.0 by depth.1. So the cardinal.two- *vs*. ordinal.two-arrangements not-only distinguish cardinal *vs*. ordinal, but-also distinguish a division from a severence.

• The primary.arithmetic-initials I1 and I2 bi-partition all LoF.arithmetic expressions into Only.two equivalence.classes, named dominant *vs*. recessive.

B. Interpretations of LoF as Boolean and logic

• When the.marked.state becomes re-interpreted as Boolean.1, then each-empty.cross and all dominant.expressions also become re-interpreted as having value Boolean.1.

At the same time, the template: '(( )unmarked)right.angle'cross'line.mark' = '(( )unmarked)Cross', which I name 'opus', becomes a postfix logical.negation-operator: (p)opus = not(p).

At the same time, the primary.algebra.expression '(p)opus.juxtaposed.with.q' becomes the material-implication template: 'not.p.and/or.q'.

• And when Boolean.1 and the empty.cross and dominant.expressions become re-interpreted as logic.value:true, then the primary.algebra can transcribe propositonal.algebra-formulas.

Validity in logic is associated with formulas that are logically.true. For example, the universal-syllogism Barbara is a valid formula.

C. Ontology
At this point, *before* we discuss interpreting LoF as **numbers** (1+1=2≠1, etc.), I want to bring the topic of "ontology" into the-above formal-situation.

C.1. The universal-syllogism Barbara involves the ontological-distinction between an.**existing.individual**.in-a.particular.subset vs. <u>non</u>existence.of.any.individual.in-that.particular.subset (which is thus an.empty.subset).
Barbara asserts: 'all a are b and all b are c, *therefore.necessarily*: all a are c'. It has three universal-statements. What a universal such as 'all a are b' means is that 'Set A is a subset of Set B'. But this ONLY-*necessarily*.means-that 'subset A.minus.B is empty'. It does.NOT.*necessarily*.mean-that the.subject.Set A *has* a member, i.e. has an **existing subject individual**. If Set A is empty, then 'all a are b' is "vacuously true". Nonetheless, if the two subsets 'A.minus.B' and 'B.minus.C' are both empty, then-*necessarily* subset 'A.minus.C' is empty (draw an Euler.diagram). (Then <u>*IF*</u> some **subject** a in Set A **exists**, **it** *necessarily*-must-be in Set'A.intersection.B', and therefore in Set B.)
The-<u>subject</u> of the sentence: '<u>Jack's son</u> is 17 years old' <u>does-not-exist</u> (and so the sentence is neither true nor false). So the distinction of whether a **subject actually-exists** *vs*. 'is only a formal.fiction' (in a particular subset) can be a crucial concern in logic.
'***A single*** properly-placed **existence** will-falsify a universal-statement, e.g.: '**existence 'a'** in subset A.minus.B falsifies the universal *'all* a are b'.
The-distinction: '**exists** *vs*. does.NOT.**exist**' (in a particular subset) is an example of ontology (e.g. W.Quine).

<u>**3)**</u> and C.2. From the LoF.notational.representation of the syllogism Barbara as condensed-syllogism.archetype, eight valid all-universal- and sixteen valid **existential**-syllogisms can be derived using transposition and C1 reflexion and negation. Here we have a relation between valid all-universal- and valid **existential**-syllogisms such-that from each all-universal-syllogism, two valid **existential**-syllogisms emerge, as-if an <u>**ex**</u>istence becomes <u>***ex***</u>truded from negating a 'universal form asserting-<u>non</u>existence (empty.subsets)'.

C.3. G.Spencer-Brown states an ontology in the Notes in LoF: "…to experience the world clearly, we must abandon existence to truth, truth to indication, indication to form, and form to void…". This posits successively"deeper" levels: physical.existences(at "surface"), true.statements, indications, form, void.
• Regarding the level of existences, in LoF Appendix 2: "…no existence [logically-, necessarily-]*follows* from another existence so that from […] a list of statements asserting existence only, no proper conclusion can be drawn". Spencer-Brown therefore wants to 'abandon existence to truth' in order to arrive in a place where logically.valid-inference *necessarily.preserves*-truth, as in the syllogism Barbara. He called a space.of.TruthOnly a "crystalline heaven". Truth is not an object like an existing.thing: it is a meaning and lives in semantic.space in a mind.
• When we abandon truth to indication, this corresponds to the shift in logic from semantic.truth to syntactical 'rules of inference' such as 'modus ponens'. Indications live in formal-sign.space.

• By ‘abandon indication to form’ he means ‘abandon indication (LoF expressions) to the form of TheFirstDistinction: unmarked.state ≠ marked.state’.
•And finally: abandoning the.form.of.TheFirstDistinction to void: What can that mean? In one sense it means abandoning distinctions and form to no-distinctions and no-form. But Spencer-Brown was a mystic, and I say that if we are lucky, when we abandon ‘TheFirstDistinction’ to void, then from-out-of-the.formless.void might *shine* the living *light* of *Being/Presence*. Now that’s ontology!: Greek ‘*ontos*’ means ‘being’, ‘is.ness’. (For a fuller-treatment see Engstrom 2023, G.1i. pp648-650.) (For ‘being’ and ‘existence’ in philosophy and logic see Munitz 1974.)

D. ontology, <u>**existence**</u>, and **numbers**
Now to **numbers**: 1+1=2≠1 (integral.domains):
• LoF I1:⏋ ⏋ =⏋ , also C5 (de)iteration: bb=b, are *non*numerical. Interpreted as Boolean, they are idempotent-under meet and join. (A.N.Whitehead knew that Boolean algebra is nonnumerical.)
• But for the cardinal.**number.2**, LoF I1: ⏋ ⏋ =⏋ must be ***dis*allowed**.
THEN an empty.cross ⏋ can represent a cardinal.**number.1**, and ⏋ ⏋ can represent a cardinal.**number.2**, etc. Moreover, number-calculations can be done using some LoF equations properly-restricted. Note: Lou Kauffman, Wm Bricken (and his student Dave Keenen), and I, have each devised LoF-based systems for cardinal.numbers.

The most primitive use of a cardinal.**number.1** is as a tally indicating some **existing.physical.object**, say: a stone or a house. (Of course it also has more-abstract uses.) In grammar there is a distinction between indicative.mood e.g. ‘is’ *vs*. subjunctive.mood e.g. ‘would’. A subjunctive expresses what is imagined or wished or possible, i.e. is mental, hypothetical, thin“air”. But an **indicative** expresses a simple statement of a **fact**, i.e. **existence**, “<u>**earth**</u>”.

We thus have two sources of a LoF-based cardinal.**number.1**:
(1) disallow deiteration and idempotence by ***dis*allowing** LoF I1 so-that now ⏋ ⏋ ≠⏋ ;
and (2) ‘**some a is** b’ where ‘**some**’ means ‘at least one **existing.physical.subject**’.

<u>**4)**</u> But there is another relation worth-mentioning: the Boolean.algebra interpretation of the (LoF)primary.algebra, <u>*in-relation-to*</u>: integral.domain numbers including real.numbers.
Here are Three LayeredRealms: 0.LoF, 1.Boolean.algebra, 2.**numerical.math**:
0.LoF can be seen as precursor-to, and can be interpreted-as: 1.Boolean.algebra:$\leq\wedge\vee\neg$.
1.Boolean.algebra can be seen as precursor-to 2.integral.domain-**numbers**.
The relation of Boolean to **numbers** is lucidly-seen in their polynomials, *namely-that*:
idem$\wedge\vee$Boolean.polynomials *relate-as-infrastructure-to* the.Superstructure.of ‘integral.domain-**number**.polynomials.
It will suffice to only-consider monomials. There are Only.four Boolean.monomials: ‘0, p, p.complement, Boolean.1’, due-to ‘p.conjunct.p = p’ also ‘p.disjunct.p = p’ (idempotence, e.g. as LoF C5). A **numerical**.monomial has.the.form: ‘coefficient.multiplying(the n.th exponent of x)’ e.g. ‘**17**.times.(**x**^**5**)’ where coefficient and ‘x’ and exponent are-all **numbers**.
Boolean is idem: bb=b (in logic: ‘true and true = true’ also ‘true or true = true’).
But **numerical** is **non**-idem: <u>**1**</u>+<u>**1**</u>=<u>**2**</u>≠<u>**1**</u>.

Non-idem **numerical**.**2**=┐ ┐ ≠┐ is produced *via* ***dis*allowing** LoF I1.
But allowing-LoF.I1 produces idem ┐ ┐ =┐ = Boolean.1.
We can see that in a LoF.based **numerical**.monomial, if we shift-from the.***dis*allowed**.LoF.I1 to *NOW-Allowing*-LoF.I1, then '**17**.times.(**x^5**)' *collapses*-to the.Boolean.monomial 'p' (where x was **non**-idem.**numerical** but now p is idem.Boolean). In this sense, Boolean.polynomials are-the-infrastructure of **number**.polynomials, and **numbers** are "a layer on top of" Boolean!

In conclusion, LoF has a "through-line" from Source.as.void to: form as distinctness and as indications of properties such as continence and truth and existences. We have a sequence from void to FirstDistinction to unmarked to┐ to primary.arithmetic to primary.algebra to idem-Boolean to sets to sentences to truth to logic and valid-reasoning to non.idem-cardinal.**number.1** indicating an **individual.existence**.

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