A Sociological Reading of George Spencer-Brown’s *Laws of Form*

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ABSTRACT: A sociological reading of George Spencer-Brown’s *Laws of Form* consists in reading it as a theory of the observer. The paper looks at the “cross” established by the calculus of indications as a universal operator of general, or reflective, negation, presents second-order observation as a means to introduce indeterminacy as a precondition to communication, and reads Spencer-Brown’s primary arithmetic and primary algebra as steps towards an understanding of the (socio-)logical space comprehending any arrangement and re-arrangement of indications and distinctions. A short overview of the history of the notion of “form,” or “idea,” as developed by Plato, disclaimed by Kant and Hegel, and employed by Marx, Simmel, and Cassirer shows that this notion from the beginning hides, and passes on, problems of self-reference, even if disguised as transcendental subjectivity. A way to deal with these problems may be shown by Spencer-Brown’s introduction of imaginary states within equations of the second degree. Imaginary states, or values, allow time, society, nature, and technology to be introduced as references accounting for, exploring, and exploiting the indeterminacy created by them.

“(…) we need a theory of the observer.”
(von Foerster, 2003a: 247)

1. Knowledge

A sociological reading of George Spencer-Brown’s *Laws of Form* consists in reading it as a theory of the observer. The observer is a cognitive entity showing to another observer how knowledge comes about. Knowledge is the product of the second observer. It is their knowledge of how the first observer uses distinctions to indicate their whereabouts, thereby producing their form of differentiation within their space of construction.1 Knowledge is a product of reproduction in time, of bias in society, of closure in states of affair, and of performance in technology. It is inherently uncertain, creating its own indeterminacy to open a space of communication.

The notion of observer applies to any cognitive entity, from bacteria, plants, organisms, and their organs, up to minds, families, organizations, culture, and machines. The approach is based on second-order observations. The assumption that there are first-order observations is

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1 To avoid talking about “him,” “her,” or “it” when referring to the observer, I use the generic plural and talk of “them”.

the assumption of a second-order observer who must assume the same for themselves. Thus, the approach is removed one step from reality. Knowledge pays a price. It is different from reality.

2. A Universal Operator

Spencer-Brown’s calculus of indications relies on the introduction of a universal operator of general instead of just binary scope (Spencer Brown, 1961). This operator, the “cross,” an instruction as well as a mark, is a token for indication, distinction, and negation at the same time. Being a token of something, it is not identical to what it is a token from. It creates its own reality, viz. a mathematical one, on a previously blank sheet of paper. It gives us the means to calculate indication, distinction, and negation.

The two “laws of form,” which give Spencer-Brown’s book its title, define how to deal with the universal operator. The “law of calling” defines that to recall is to call (Spencer-Brown, 2008: 2). The “law of crossing” defines that to cross again, or to recross, is not to cross (ibid.). The former produces an identity, the latter a void. Since “we cannot make an indication without drawing a distinction” (ibid.: 1), there is right from the start of the calculus an awareness of an “unmarked state” (ibid: 5), viz. the other side of the distinction, or the outside of the form, coming with the indication.²

In fact, the observer is only introduced in chapter 12 which is the last of the book. They are implicit in any distinction as being on its outside “from which it is supposed to be seen” (ibid.: 57). Yet, the chapter conducts four experiments to find out how marks relate to their outside and discovers that the observer, “since he distinguishes the space he occupies, is also a mark” (ibid.: 63). In the last sentence of the chapter and thus also of the text of the calculus we then read “that the first distinction, the mark, and the observer are not only interchangeable, but, in the form, identical” (ibid.). Thus we are sent back to chapter 1 of the book which introduces the distinction (ibid.: 1) and to chapter 2 which introduces the mark and the form (ibid.: 3) to consider all three of them to be identical, in the form, to the observer.

Spencer-Brown’s calculus of indications is a calculus which lets the observer discover themselves by drawing their distinctions. Watching themselves, however, as Spencer-Brown

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² Spencer-Brown in a preface to the 1994 edition of Laws of Form distinguishes between consciousness and awareness when emphasizing that his calculus does not distinguish between reality and appearance but instead relies on an “awareness of appearance” (Spencer-Brown, 1994: vii). Awareness, in Western civilization, tends to be buried almost completely under consciousness (ibid.: ix). Consciousness insists on identities, whereas awareness switches more lightly between marked and unmarked state.
relates in the notes to chapter 12, the observer cuts themselves into states that see and states that are seen, and thus see themselves only partially, even making themselves distinct from, “and therefore false to,” themselves (ibid.: 85). The calculus starts with the paradox of defining the two operations of indication and distinction as one, and it ends with the paradox of describing the observers as the one who becomes, by watching themselves, distinct from themselves (see also Luhmann, 1999). In between those two paradoxes we find the calculus developing its arithmetic, its algebra, and its re-entry of its distinctions and indications into their form such that it becomes self-referential and, thereby, so indeterminate as to force the calculus to enter a new state which Spencer-Brown calls “imaginary” (ibid.: 48). The state is imaginary in time but it may also be imaginary in the social or the factual, calling not for distinctions in moments of time but for distinctions in social perspective or ecological relation, thus turning the relevant operations of indication and distinction into functions of themselves which either oscillate, memorize, or modulate. The operation of observation lands in “a tunnel” (ibid.: 49), which lets it switch between inside and outside, mark and unmarked, as a function of its self-observation. Indeterminacy is both the result and the medium of the enfoldment of the self-reference of the observer which lets them invent and discover the many states in time, the social and the factual they then may describe, i.e. indicate and distinguish, as their reality.

Using Spencer-Brown’s notation for the re-entry of a distinction into its form of distinction, we retain content $a$ within its negation by writing:

\[
a = \overline{\overline{a}}
\]

The form of $a$ is $a$, reflected within the logical space of its negation (see also Luhmann, 1975; Scheier, 2016; Baecker, 2017a). Call this sociology’s primitive when dealing with Spencer-Brown’s *Laws of Form*. The observer is implicit in the cross and its re-entry into the form, since “anything said is said by an observer” (Maturana/Varela, 1980: 8) and “anything said is said to an observer” (von Foerster, 1979: 5), thus turning the $a$ into a reference produced by second-order observations.

The observer, $obs$, may apply this primitive to themselves,

\[
obs = \overline{\overline{obs}}
\]
but this does only show that indeed indication, distinction, and re-entry are the very basic operations of cognition. The universal operator is defined as a negator linking whatever is indicated to complements which are reflected in the indication and contextualize it with respect to distinctions drawn by an observer.

3. Paradox

Spencer-Brown’s calculus of indications develops a theory of the observer out of the paradox that there is no observation which is not at the same time self-observation. The universal operator is a negator to make sure that no indication and distinction ever assume a self-evident identity. The calculus does not count and order elements of sets to be classified in any determinate sense. It counts and orders operations entangled within a network of functions which turn the cross into the nervous heart of any restless knowledge.

Note that “paradox” here does not only refer to mathematical, let alone logical tradition but even more so to a rhetorical and literary tradition (Burke, 1969; Deleuze, 1990; Roberts, 1992; Luhmann, 1999). The content $a$ equals non-$a$, or $\sim a$, if it can be shown to depend, with respect to its very identity, on something that it is not, be it a genre it individually does not quite fulfill, a context, a passing situation, an opponent, or a counterpart. The philosophical tradition seeks shelter in “dialectics,” that is in ideas that better distinctions will reveal the truth in apparent paradox (Plato, Sophist: 253c–e), struggling forever with the question whether contradiction should indeed be considered a problem of observation or, rather, resides within the things themselves.

Sociology, as should be evident, adheres more to rhetoric than to mathematics. Rhetoric is old and proven knowledge about the intricacies of communication. Mathematics and logic to this day are trying to catch up (Kauffman, 1999). Communication oscillates almost ‘by nature,’ since it has to deal simultaneously with different partners and their divergent perspectives, with an open future, and with uncertainties about the issues at hand. Given the choice it rather retreats to metaphor to avoid an unambiguity that does not exist (Wellbery, 1997). Spencer-Brown’s cross as a token for indication, distinction, and negation is seen as an oscillation between marked and unmarked state. It gives us a first understanding of what any communication is about, viz. both content and target ambiguity (Leifer/Rajah, 2000; Leifer, 2002), to be dealt with by further communication.

Wittgenstein (1961: no. 4.0621) said “that nothing in reality corresponds to the sign ‘$\sim$’.” Strictly speaking, the sign “$\sim$” indicates an observation diverging from another observation. Without exactly saying so, it implies observational self-reference. The observation of content
a as ~a opens up a space of observation, more exactly: of second-order observation. A second-order observer – who may be the first-order observer observing themselves – reflect, via negation, on the context which content a may be distinguished from, and related to, and on the operation of observation bringing forth content a. The “form” of a, its plan, scheme, concept, draft, or design (from lat. forma = plan etc.), includes (i) content a on the inside of the distinction, (ii) a context it is distinguished from on the outside, (iii) the operation separating inside and outside, and (iv) the space brought forward by the observation. As Spencer-Brown puts it: „Call the space cloven by any distinction, together with the entire content of the space, the form of distinction“ (Spencer-Brown, 2008: 3). And “distinction is perfect continence” (ibid.: 1).

The form is indicated and distinguished by a second-order observer who observes a first-order observer drawing the distinction and indicating a. The first-order observer seeing contents to differ in value may thus have a motive to draw the distinction (ibid.: 1), yet this is a statement about the reality of the first-order observer which the second-order observer would need further distinctions to indicate.

The negation introduced by the universal operator of the cross is not a nihilistic, or annihilating, operation. It risks doing away with content a, yet it deals with this risk by re-entering the distinction into the form, thus exchanging both the evidence of a and its possible cancellation for a basic indeterminacy, a weakness, which is the logical space, a space of logos, of description and debate, talk and action, sense and meaning, where observers are living in.

To read Wittgenstein’s logical space and Spencer-Brown’s mathematical space as a sociological space means to watch second-order observers producing contents able to be differentiated and reproduced. The sociological space is the space of indeterminacy, created by the paradox of a being equal to ~a, yet inviting observers to inquire further into the context and space of content a. The sociological space is a space of communication, introducing and exploiting general negativity where before there has been nothing but reality. Instead of the one and only reference to reality, the introduction of negativity produces a reference overflow also known as meaning (Luhmann, 1990). That reference overflow is enabling observers to switch indications and distinctions and to thereby create a meaning which is restless and lively to begin with (Godart/White, 2010). The current paper is but one example.

In the remainder of this paper I take a closer look at the logical space of form (4), recall a short history of the notion of form, or idea, in philosophy and social sciences (5), consider some resources to make use of imaginary states in communication (6), and draw a conclusion (7).
4. The Logical Space

There are only a few symbols in Spencer-Brown’s calculus of indications, the cross or universal operator, \( \overline{\text{\(\_\)}} \), the void, \( \Box \), and the cross re-entering its form, \( \overline{\text{\(\_\)}} \). They allow us to build arrangements, such as \( \overline{\text{\(a\)}} \), \( \overline{\text{\(\text{\_}\hspace{1pt}}\hspace{1pt}a\hspace{1pt}\text{\(\_\)}} \), or \( \overline{\text{\(a\)}} \overline{\text{\(b\)}} \overline{\text{\(c\)}} \). Arrangements are any number of tokens “considered with regard to one another (that is to say, considered in the same form)” (Spencer-Brown, 2008: 4). Any arrangement intended as an indicator is called an expression (ibid.). The cross and the void are symbols of the primary arithmetic of the calculus of indications. Variables like \( a, b, c \) are symbols of the primary algebra.

Note that the symbol introduced by Francisco J. Varela (1975: 7) to denote an “autonomous state”, \( \overline{\text{\(\Box\)}} \), is a symbol already used by Spencer-Brown (2008: 53) to denote the re-entry of a cross into its own form, creating an “imaginary state” (ibid.: 48). In the Laws of Form there are no autonomous states but only forms produced by second-order observation.

The primary arithmetic shows how to work with the cross and the void (ibid.: chap. 4). According to the law of calling (ibid.: 2), the arithmetic shows that any cross may be one of a number of crosses, to be condensed into one or to be confirmed by more of them. Whatever the observer does, they do it reproducing, enfolding, and compacting themselves by whatever simple or complex arrangement they may choose to indicate what they are about. And according to the law of crossing (ibid.: 2), the arithmetic shows that any void the observer indicates is a cross canceled by the instruction to re-cross, such that the void may be compensated for, that is indicated, by the instruction to re-cross a cross.

The double message of the primary arithmetic is that whatever the observer does, they reproduce themselves by drawing distinctions and that whatever the distinction indicates, its indication is due to the observer and nothing else. Observers distinguish what without their distinctions would be indistinct. They create a logical space (a space of logos, prior to any distinction between true and false) which is the space of a language game (Wittgenstein, 1961a, 1953).³

It is only with equations of the second degree and their possibility to re-enter distinctions into their form that the observer will be able to notice the paradox and the life they owe to its

³ My reading of Wittgenstein’s Tractatus is that of maybe “the world’s longest koân” (Pearce/Cronen, 1980: 67). Wittgenstein’s Philosophical Investigations (1953) extend this koân, they do not contradict it.
enfoldment. This is why the theory of the observer is couched in terms of second-order observations.

Whereas the primary arithmetic is about the constants of the calculus of indications, the primary algebra is about variables (Spencer-Brown, 2008: chap. 6). “The algebra is about the variables, or is the science of the relationships of variables. It is a science of relationships of the variables when you don’t know or don’t care what constants they might stand for” (Spencer-Brown, 2019: 37). The primary algebra introduces variables, such as $a, b, c$, which the observer may use to mark their indications. Any one of these variables is a value that is an expression of an arrangement of its own. Searching for that arrangement and applying the laws of calling and crossing any variable may be reduced either to the marked or the unmarked state. Using Wittgenstein’s (1961b: 94) distinction between sense ($\text{Sinn}$) and meaning ($\text{Bedeutung}$) we may say that a variable has a sense the meaning of which is still to be displayed (muss sich noch zeigen, cf. Wittgenstein, 1961a: no. 4.022). The variable is an element of a logical space that suspends the truth or falseness of the variable. It does so to be able to investigate it. This investigation may switch between different languages, e.g., the vernacular, sciences, and arts. It may use different senses. It may trust techniques or rather intuition.

Coming up with variables beyond the constants of the cross and the void, the primary algebra gives us the means to complement structural (or syntactical) analysis with semantic analysis. Observers are now invited to call by names what they choose to indicate. They not only refer and relate, but they also talk. They put variables in, and they take them out, thereby creating “positions”, as Spencer-Brown (2008: 23) calls it. And they collect and distribute their variables, thereby creating “transpositions.” Spencer-Brown calls “consequences” some ways to work with positions and transpositions, showing how to “reflect” a value (ibid.: 23):

$$\overline{a} = a,$$

to “degenerate” (read from left to right) and “generate” (from right to left) expressions (ibid: 25):

$$\overline{ab} = a \overline{b}.$$

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4 It is an open question whether it is helpful, or not, to distinguish between social systems (communication) and psychic systems (consciousness). What is said, written, or read is not identical to what is to be seen, heard, tasted, or smelled. I will not go into that distinction in this paper, yet see Rustemeyer (2013, 2017).
to “integrate” (“reduce” from left to right, “augment” from right to left) (ibid.: 26):

\[ \overline{a} \left| \overline{b} \right| \overline{c} = \overline{a b c} = a \]

or to scale expressions via “echelon” (“break” from left to right, “make” from right to left) (ibid.; 28):

\[ \overline{a \ b \ c} = \overline{a c \ b \ c} \]

There are two more consequences (“modified transposition” and “crosstransposition”, both arrangements to “collect” and “distribute” variables, ibid.: 28f.) but it should be clear by now what those consequences mean for a theory of the observer. They constitute a calculus of semantics to be used in the history of ideas, discourse analysis, sociology of knowledge, philosophy of deconstruction, metaphor theory, and any school of an analysis of semantics which is interested in its structural sense, syntactical position, and pragmatic meaning.

It should be possible moreover to look for consequences working on empty spaces instead of on variables and thus use the universal operator to combine Spencer-Brown’s primary algebra with Gotthard Günther’s ideas on polycontexturality which distinguishes values by their working as either reception or rejection values with respect to other distinctions within their form (Günther, 1976; see also Esposito, 2013). This would give us a general calculus of negativity which would profit from two features of Spencer-Brown’s calculus which here turn out to be important. One is that in his algebra any one operator does not only work on two but all elements of an arrangement, in fact on an unlimited number of elements depending on the expression to be arranged (Spencer-Brown, 1997: xv). And the other feature is that equally
contrary to classical, e.g. Boolean, algebras the variables are to be determined simultaneously, interdependently, and irrespective of the chosen sequence of analysis (ibid.: xv).

Yet these and other features possibly show their power more clearly when accessing equations of the second degree. Before we do so, however, let us look at the philosophical and sociological history of the notion of form. It is an intriguing history since perhaps contrary to a first understanding of the word, “forms” are among the most elusive issues and notions of this history, while all the while attracting interests in issues which have a both self-referential and transcendental air to them.

5. Medial Form

As already mentioned, the English word “form” comes from the Latin word *forma* = plan, scheme, concept, draft, design, shape, figure, frame, or gestalt, and is derived from the verb *formare* = to plan, to scheme, the conceive, to draft, to design, to figure, to frame, to shape, to build. *Forma* is a translation from the Greek words *idea, eidos, morphé, paradeigma*, which were used decidedly indistinctively by Plato to denote ideas that are given transcendentally to help or even determine the recognition of things, events, and, in fact, ideas (Schäfer, 2007). In his *Seventh Letter*, which is one of the few if not the only text where Plato becomes explicit about the otherwise esoteric teaching of his “theory of forms” or “theory of ideas,” Plato lists five conditions of any cognition, as there are, first, a name given to something (e.g., to a circle), second, a definition of it, third, an image of it not to be confused with the thing itself, fourth, a knowledge of right opinions about it (including the acknowledgment of possibly false and also of doubtful opinions), and fifth, the unity of all these conditions having its place not in the visible or in sounds but in souls. These souls arrive at their understanding in a cautious process of working through – “as the mind moves up and down to each in turn” – any one of these highly ambiguous steps (Plato, *Seventh Letter*: 342d–343e).

Using the notation of the calculus of indications we may write to express Plato’s understanding of idea or form:

![Diagram of idea = something, name, definition, image, knowledge]

The fifth condition of any cognition, the unity of the four first elements, consists in the re-entry of all four distinctions into the something the idea of which is to be determined. Plato
developed dialectic thinking to express the differential interdependency of negative elements of any determination, yet since he did not know of a mathematical way to write down the results of dialectic thinking he refrained from writing (moreover considered soulless) and relied on oral teaching in his academy. Hence the distinction between his exoteric, published, and esoteric, unpublished teaching (Oehler, 1998, 2001).

Ever since there is a self-referential and at the same time transcendental aspect to any understanding of form. A form refers to itself to determine what it is. It does so by a process of cognition which consists of constants of the form that are difficult to variabilize, name, and reflect upon. Throughout the history of European philosophy it would stay a mystery who or what is doing the reflection, again and again calling for “transcendental” solutions.

Aristotle derides Plato’s theory of ideas (Metaphysics: 990a–993a) and opts instead for a distinction between matter and form, form (idea, morphé) being the either spontaneous (physis) or artificial (techné) cause which determines the condition (energeia) and the result (ergon) of a process of becoming (dynamis) and negation (stèresis) that plays out in matter (hyle) (ibid.: 1028b–1034b).

Attempts to break the symmetry and circle between matter and form by calling form the external and matter the inner content are contradicted at the latest by the Earl of Shaftesbury and Wilhelm von Humboldt who speak of “inward form” to denote “forms that form” beyond our mind, and not least form the mind as well (Shaftesbury, 1999: 323f.), and of the “inner form” of language which is the life form it gets from every individual mind trying to express itself (Humboldt, 1999: 81–87).

Yet Kant and Hegel dissolve the distinction between matter and form for good by calling the form prior, since “standing for itself,” to matter (Kant, 2003: B324) and by calling them “by themselves the same” since matter contains form as the unity of its determinations and form as “reflection-in-itself” contains whatever may be called matter (Hegel, 1991: § 129).

The notion of form stays in use nevertheless. Or, better, it keeps a fascination which relates both to its self-referential and transcendental aspects and the lack of any means to work with these aspects in a technical, logical, or mathematical manner. Referring to Edmund Husserl’s diagnosis of a “crisis” of European science one might even say that the notion of form is somehow at the crossing point between the triumph of rational objectivism, on one hand, and the urgent feel that there is a “paradox of subjectivity” (Husserl, 1970) still to be explored, on the other. This paradox of subjectivity relates to the observation that any knowledge must be performed by somebody, a knower, in the first place, to be knowledge at all. The success of science, however, tried to erase any recognition of the observer asking questions, posing problems, collecting data, and making models. Husserl proposes a
transcendental phenomenology to work on, if not solve, the paradox, and it may well be that
this phenomenology is a useful frame to discuss Spencer-Brown’s calculus of indications.
“Transcendental” here means to account for mutual reflections within any one form of both
the knowledge and the knower nevertheless staying separate.

Yet, to complete our rough sketch of the story of the notion of form it is necessary to hint
not only to the self-referential and transcendental aspects, but also to the medial aspect of
form as understood, again implicitly, for instance by Karl Marx, Georg Simmel, and Ernst
Cassirer. They lack the technical means and do not use the notion of medium to explain their
use of the notion of form. But their analyses resume perfectly what a “medial form” may be
about,\(^5\) which is a dynamic entity, an observer, who digitizes complex environments to
produce and re-produce itself employing action and communication co-producing these
environments.

Marx (1990) calls “commodity form” the unity of the difference between use-value and
exchange-value, self-referentially constituted in any exchange, reflecting upon a society of
commodity-owners dissolving and recombining all aspects necessary for a commodity to
come about, and thereby constituting the very medium into which the forms are to be
impressed:

\[
\text{commodity form} = \text{exchange value} \bigg| \text{use value} \bigg| \text{society of commodity owners}
\]

Simmel conceives of “forms of sociation” (*Vergesellschaftung*), such as domination,
competition, imitation, party formation, or representation, as forms attracting, and shaping,
different contents of human interaction (Simmel, 2009) and considers the individual as an
attempt to give form to a life by which is maintained/maintaining and threatened/threatening
at the same time (Simmel, 1999):

\(^5\) *Mediale Form* (German, “medial form” in English) is the German translation of the Greek grammar term
of the middle voice, used by Jacques Derrida to describe *la différence* as “an operation that is not an
operation” (*mediale Form*; Derrida, 2004: 119; *voix moyenne*: 1968: 47; *middle voice*: 1982: 9). The
middle voice is a *genus verbi* which is neither passive nor active, denoting a subject which is in a state or
constitution neither agent nor patient. The term “medial form” captures that specific aspect of form which
indicates its ability to constantly re-calculate itself according to its use and circumstances, or according to
the variables an observer tries to emphasize, conceal, or reveal.
And Cassirer (1965), even though he considers himself neo-Kantian, has a rather Platonic understanding of forms since he considers forms like myth, religion, language, arts, and science to be spontaneous products of the mind lending symbolic order to a world which remains removed one step from reality:

Whereas Marx had a societal (= critically political economy) understanding of forms and Simmel was most interested in the constitution and dissolution of forms, Cassirer may have been the first to develop a “functional” theory of forms describing their use in different historical times to create order for people inventing and applying them.

Our rendering of these forms as re-entry arrangements may emphasize both the Platonic, i.e. dialectic or reflective aspect, and the Aristotelian, i.e. dynamic aspect about them. Those forms are never static. They reflect, iterate, generate, and integrate what remains divided if not separated nevertheless. They use the aspects they are built from, and impressed in, as the medium which they generate by employing them. Strictly speaking, forms are medial forms that use their indications and distinctions to arrange and re-arrange.

Thus, forms have two different states of aggregation. On one hand, they are tangible “things” internally integrated due to the rather rigid couplings of their elements. On the other, they are intangible, even invisible, “media” as they consist of a loose coupling of elements to be dissolved and recombined according to circumstances. That is, we may combine Spencer-Brown’s notion of form with Fritz Heider’s (1959) distinction between rigidly coupled things and loosely coupled media to have a further understanding of the relationship between the actual and the potential which is important to comprehend the transcendental constitution of the self-reference of form.

6. Imaginary States

A sociological reading of Spencer-Brown’s Laws of Form certainly starts with acknowledging the (at least) two-sidedness of any distinction, which means that to indicate
something one has to exclude or neglect something else which, however, does not thereby disappear but accompanies whatever is focused upon as its shadow and excluded other (Luhmann, 1999). “Distinction is perfect continence” (Spencer-Brown, 2008: 1), in its form it contains what it does not contain. The mark is a cross, oscillating between its two sides. First-order observers may be haunted by what they exclude; second-order observers may choose whether to bring it back into focus or find compensatory measures. Most social situations are about how first-order observers, caught off-guard, so to speak, deal with second-order observers trying to “enlighten” them, and vice versa. Communication is about the construction of a reality consisting of a knowledge deciding what, for the moment being, to ignore. Any form has its latency, or supplements, acting as “threats,” should any variable “even consider doing the wrong thing” (Spencer-Brown, 1992: 9).

A sociological reading of Laws of Form is about distinctions being concatenated to construct forms arranging complementary, supplementary, and even competing indications to express complex norms, institutions, networks, or systems. I call “catjects” arrangements of indications and distinctions which may be understood to express eigen-values of recursive and reflexive functions producing and re-producing social situations ranging from face-to-face contacts via organizations to societies and their systems and networks (Baecker, 2007/2008). I call them catjects because they categorically link subjects and objects in their play of mutual, respective, co-productive, and at any moment transcendental (reflective) constitution.

The most interesting feature for a sociologist reading Laws of Form is the cross not only operating as a universal negator, presenting a social situation with the dynamics of inclusion and exclusion, and constituting arrangements of concatenated distinctions, but also being both operator and operand in equations of the second degree as soon as distinctions are re-entered into the form of their distinction (Spencer-Brown, 2008: chap. 11). Equations of the second degree create a new situation within the calculus of indications. They concern infinite arrangements and expressions which cannot anymore be reduced to either the marked or unmarked state. Spencer-Brown (ibid.: 48) speaks of a “loss of connexion with the arithmetic.” This introduces a fundamental degree of indeterminacy into arrangements and expressions (ibid.: 47), at any instant possibly changing the asymmetry (“order”) of crosses into mere symmetries (“numbers”) of markers. Basically, we do not know anymore whether we deal with numbers of crosses or with mere compensations by markers for a void concealed

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in its most elaborate expression. Since we do not know we cannot decide what at any instant is the case.

Both are possible, and the fact of the possibility of both creates sociologically interesting situations. Think about political measures, economic investments, scientific discoveries, religious beliefs, pedagogical instructions, or declarations of love. Thankfully, there are artists’ works that train us to accept that kind of fundamental indeterminacy. Yet, even beyond art, indeterminacy is fundamental for the possibility, if not the attractiveness of communication. Why else communicate? Always trying to solve situations of indeterminacy, it is necessarily creating new such situations, being, as it is, removed one step from the one and only reality.

Spencer-Brown calls “imaginary” any state which, being an element of an infinite expression, may be solved neither to the cross nor to the void (ibid.: 48). For Spencer-Brown, searching for a possible understanding, it is a state in time (ibid.), yet sociologically we may envisage it also as a state in society or in nature. Any fundamentally indeterminate state may qualify. This is the one idea which is perhaps present in Plato’s understanding of form, yet seems to be absent in Marx’s, Simmel’s, or Cassirer’s use of the notion of form. A form is calling for a decision of the undecidable (von Foerster, 2003b); it is calling for a subject investing its own understanding within a situation which is and remains unknowable; it is calling for the observer.

We may even consider the ability to imagine and thereby create situations of indeterminacy one of civilization’s greatest achievements. To imagine a before and an after, to distinguish between past, present, and future; to imagine that indeed fellow human beings, not to speak of fellow observers (such as spirits and devils, plants and animals, feelings and intuitions, reasons and ideas), employ different perspectives; and to imagine that nature within and without presents us with matter many features of which remain unknown to us; all these imaginations are inventions which produce intelligibility doubling as an inexhaustible heuristics of the world we co-produce. All this would collapse like a house of cards – and a house of card indeed it is –, if we started to think we know who exactly is the observer.

Thus, there are at least three resources to compensate for the impossibility to know “of where we are in the form” (Spencer-Brown, 2008: 48), viz. time, society, and nature. We may add technical artifacts. Usually, we consider those four part of the problem, here we think they are part of the solution, yet of a solution to a problem they help to re-create to be at hand for further solutions. All four are more of a kind of “horizons” impossible to reach and fix (Husserl, 1980) than states to hold onto. And yet, they give exactly the orientation we need to deal with the indeterminate. Time means to know that any event has its own relativity with
respect to different observers and to different resorts and anticipations of past and future. Society means to know that observers not only differ but seek to differ to state their identity. Nature means to know that any further examination of a thing may reveal both hitherto unknown ingredients and unknown context-dependencies. And technical artifacts are as much devices to contain and exploit known causalities as devices to probe for as yet unknown causalities. Time is reproduction obtained, as long as it goes, from decay. Society is culture adjusted for bias. Nature is support enriched with threats. And technology as our “second nature” is almost the same, i.e. again support enriched with threats. As we try to tip the balance of our existence in favor of technology instead of nature we discover that its threats may even be greater. All four resources allow for the control of indeterminancy, with both control and indeterminancy ever renewing themselves.

All four of these resources, in order to solve and deepen states of indeterminancy call for imaginary states in the sense that these states are neither to be deduced from the arrangements they try to deal with nor to be substantiated by any other means. They have to be created ex nihilo, once again referring to an observer who is and is not part of the situation they experience and act in. In both sociology and economics, those situations are well-known even though rarely taken seriously enough (Shackle, 1961; Castoriadis, 1998). In psychoanalysis, the imaginary is the state both removed one step from the real and blocked by the symbolic which is invented and used to hide situations of indeterminancy from view (Lacan, 1991). The imaginary state is an improbable state, yet the only one to break interdependencies and to start afresh. There is no irony in that imaginary states help to create the structures of time, society, nature, and technology which create situations of indeterminacy, in the first place. The only thing we know about our reality is that we better move in circles, or, with Spencer-Brown, within the form.

7. Conclusion

Spencer-Brown’s calculus of indications in Wittgenstein’s terms offers sociology a technique to write up propositional signs (Satzzeichen) for state of affairs (Sachverhalte) we try to picture (Abbildung) (Wittgenstein, 1961a: nos. 3.12, 2.01, and 2.1). Its arrangements which give us expressions for the state of affairs we try to picture are signs meant to be read as complexities, not as connections between more simple facts, events, or distinctions able to stand for themselves (ibid.: no. 3.1432).7 An expression given by an arrangement is the

7 This is why their simultaneous viewing as forms, equations, or even diagrams is as revealing, if not more so, as their sequential reading as texts.
product of an analytical decomposition of the state of affairs we are interested in. It is not the product of emergence displayed by the elements we are able to find and name. Any expression if it uses an equals sign should index that sign by the name of the observer who draws the distinctions combined in the expression. We are talking complexities of happenings, involving and engaging the observer, we are not talking objects or subjects (Nietzsche, 2003: 154ff.).

Our theory of the observer cannot be distinguished from a theory of the observed. It sums up in a form like

\[ a = \{a\} \]

which displays the content \( a \) as indicated by a distinction drawn by an observer who remains hidden in the distinction they are drawing. I would say that this is the minimal condition for the “autonomous state” Varela (1975) was looking for. It involves nothing less but the universe already running for any closure to come about reflecting on itself. Using Ranulph Glanville’s term we may also say that the observer actually is a composer: They compose themselves as parts being a whole in a role (Glanville, 2015: 87ff.), with that role being as insistent as elusive. The transcendental aspects of this role do not refer anymore to theologies of God, Reason, History, Mankind, or Life, but to a subjectivity being involved in any observation or composition which is never to be lost to objectivity as rational as it may try to be imposed on us (Husserl, 1970). That subjectivity is that of an ego, or closure, which is nothing less but a reflection of the universe it relates to. It is what it is not. If that means that we have to leave logical laws of identity and excluded thirds for more complex cybernetic laws of paradox, ambivalence, and control (Luhmann, 1997; Baecker, 2013b; Kauffman 2019), so be it.

The moral of this story is that the observer is living in a world which they rely on to take a step back and imagine what possibly to do next. The observer is creating a situation of indeterminacy by reflecting on their infinite recursions within the world they live in. They use that situation to start anew. At any moment being able to say No, they invite indistinct further reflections. Or else, there is a double infinite horizon to any observer which consists of, on one hand, the contexts they are operating in and, on the other, they themselves who are not able to answer the question of who they are if they do not ask a second-order observer who is, as to themselves, in the very same position.
Bibliography:


