— vordenker-archive —

Rudolf Kaehr
(1942-2016)

Title

Quadralectic Diamonds: Four-Foldness of beginnings
Semiotic Studies with Toth's Theory of the Night

Archive-Number / Categories

3_02 / K04, K12

Publication Date

2011

Keywords

Cf.: Diamond Calculus of Formation of Forms (3_01)

Disciplines

Cybernetics, Artificial Intelligence and Robotics, Logic and Foundations, Theory of Science

Abstract

Transitions from a triadic-trichotomic semiotic and epistemological paradigm to a quadralectic diamond approach are discussed.

Citation Information / How to cite

Rudolf Kaehr: "Quadralectic Diamonds: Four-Foldness of beginnings", www.vordenker.de (Sommer Edition, 2017) J. Paul (Ed.),

URL: http://www.vordenker.de/rk/rk_Quadralectic-Diamonds_Four-Foldness-of-beginnings_2011.pdf

Categories of the RK-Archive

Quadralectic Diamonds: Four-foldness of beginnings

Semiotic Studies with Toth's ***Theory of the Night***

Rudolf Kaehr Dr.phil

Abstract

Transitions from a triadic-trichotomic semiotic and epistemological paradigm to a quadralectic diamond approach.

1. Four-foldness of beginnings

1.1. Quadralectics of beginnings

1.1.1. Early beginnings

In several papers, like SKIZZE-0.9.5, I developed a philosophical theory of the four-foldness of beginnings. A first mathematical realization was supported by the idea of *chiasms* and *proemial relationships*, finally formalzed as *diamond categories.*
An application to *kenogrammatics* of those thoughts was presented as a diamondization of the act of beginning of kenomic successor systems. A first sketch *"New beginnings for kenogrammatics?"* was published in "Morphogrammatics of Change".

> *"At such a start of kenogrammatics there is no need for a dualism of iterativity and accretion but a chiasm is involved of the terms internal/external and accretion/iteration, producing the double determination of situations by the wording of iterative iterativity, accretive iterativity and iterative accretion, accretive accretion. Hence, basic terms in kenogrammatics are reflectional and second-order figures. In other terms, proemiality is opening up the beginnings of kenogrammatics.*
>
> *"To choose a beginning with a mark is putting a difference into the possibility of a choice for another mark of beginning. Such a difference in the notion of representation of a beginning by a mark shall be inscribed as a*

double beginning. The question is: As which representation is a kenogram inscribed? If it is inscribed as "a" then it is differentiated from another possible inscription, say "b". If it is inscribed as "b" then it is differentiated from another possibility, say "a". A further differentiation, say into "c" , would be redundant and irrelevant for the characterisation of a kenomic beginning.
On the other hand, philosophically, with double beginnings, the necessity of a unique and ultimate "coincidentia oppositorum" (Cusanus, Hegel, Gunther) is differentiated and dissolved."
http://www.thinkartlab.com/pkl/media/Morphogrammatics/Morphogrammatics.pdf

1.1.2. Further explications of beginnings

A further application of those insights on the project of formalizing kenogrammatics might be realized simply by accepting the distinctions of a kenogram and its "environment", "A | a", as parts of a second-order diamond [A | a; a | A] and its inter-relationality.

Hence, the simple introduction of a 'beginning' kenogram to an inscription of the act of introducing it has to be closed by its complementary step towards a full inscription of the diamond of beginnings. The diamond approach is well known but there was not yet a direct formal application of it to the beginnings of kenogrammatics systems. Diamond applications had been elaborated for category theory and for mathematical semiotics.

Hence, the act of introducing a single kenogram into a trito-structure as the beginning of the trito-structure by a start rule, " ⇒ ○ ", has to be deconstructed.

It seems that the whole ambiguity, paradoxy and circularity with its blind spot of introducing a distinction and its mark in the *Laws of Form* is repeated with the singular act of introducing a kenomic start by a kenogram.

Three approaches
Gunther's postulation: ⇒ ○ .
First-order diamondization: ○ ≡ ○ ⟶ ○, hence [○ | □].
Second-order diamondization: ○ ≡ ○ ⟶ ○ ∘ ○ ⟶ ○ | □ ⟵ □, hence [○ | □]|[□ | ○].

Gunther's stipulation
Gunther's postulation of a beginning is simply putting a kenogram into the game, and declaring it as a kenogram and as the start kenogram of the trito-structure of kenogrammatics. Its further definition happens outside this kenogrammatic start formalism. The beginning of the kenogrammatic system on the level of the trito-

structure is not telling any properties of the system as such. All the features of trito-kenogrammatics are following secundarily.

Diamondization

The first-order diamondization is taking the kenogram as an automorphism, “○ ⟶ ○” , and its matching condition are thematized as the environment of the morphism by "□”. Therefore, the automorphism is defined by its own place with the matching conditions as its environment. This was called “in-sourcing” of the matching conditions into the calculus itself. Hence, if the matching conditions are changing in the process of applications the calculus and the character of its compositions is changing too. But this second-order behavior is formalized properly only in the next step of second-order diamondization, i.e. the diamondization of the diamond.

Reflection on diamondization

A second-order diamondization is additionally to the first-order diamondization taking the diamond structure of the environment into account. This procedure becomes more plausible with the full notation of the automorphism as "○ ⟶ ○ ∘ ○ ⟶ ○”, and therefore the environment as "□ ⟵ □”. Hence there are two settings in the game: one is " [○ | □]" as the *kenogram* with its environment and the other "[□ | ○]" as the *environment* with its kenogram.

Diamond category theory has established a complementarity between categories and saltatories in diamonds. The whole configuration has to be thematized at once in both directions: from categories to saltatories and from saltatories to categories. This reflectional feature applied on the beginning of kenogrammatic systems is installing the double design of the beginning as a full chiasm of the inside and the outside of a kenogram.

Such second-order construction of diamond category theory had been sketched in “Diamondization of Diamonds” of “Diamond Theory".

Metaphorics

Metaphorically, what is achieved is a formalization for the wording:” [*Inside* of the inside | *Outside* of inside] **|** [*outside* of the outside | *inside* of the outside]" as the metaphorical meaning of "[○ | □] **|** [□ | ○]".
Because the simultaneity of “*Inside* of the inside” and "*Outside* of inside” marked by "|" and the complementarity of the whole formula: "[○ | □] **|** [□ | ○]", a further formal explication is succeed by the mechanism of functorial *interchangeability*. This might hint to the concept of a complementarity of “inverse duals" (Kent Palmer).

1.2 Alfred Toth's semiotic *Theory of the Night*

1.2.1. Epistemological framework

In the process of deconstructing the classical subject/object-model for subjectivity in Western philosophy Gotthard Gunther interoduced the fundamental distinctions of "subjective subjectivity" (sS), objective subjectivity", (oS), and "objective objectivity", (oO), for the common linguistic terms: I, Thou and It. Epsitemologically this corresponds to subjectivity, "knowledge" and reality. Later, the combinatorics got some completenes with "objective subject" (Mitterauer, Toth).
In his metaphysical work of "pre-semiotic tetradic" semiotics, i.e. pre-semiotics, Alfred Toth studied all the combinatorial possibilities for semiotics, ontology, epistemeology and logic as *"real polycontextural pre-semiotics as a* Theory of the Night*".*

$$\begin{aligned}
&\text{subjective subject (sS)} \cong \text{Thirdness (interpretant relation, I)}\\
&\text{objective object (oO)} \cong \text{Secondness (Object relation, O)}\\
&\text{subjective object (sO)} \cong \text{Firstness (medium relation, M)}\\
&\text{objective subject (oS)} \cong \text{Zeroness (quality, Q)}
\end{aligned}$$

The formal terminology of the quadralectics (Kent Palmer) of a *Diamond Calculus* might be involved for a first step towards an operational implementation of quadralectic semiotics

.

The terms (sO), (oS), (oS), (sS) shall be considered as the constituents of a quadralctic diamond and building a generative system (Erzeugenden System) for the interaction and reflection of such systems.

canonical hierarchical complexion of epistemological forms

$$\text{semiotics}_j^n = \frac{\text{interpretant} - (sS)_j^{n-1} \;\Big|\; \text{object} - (oO)_k^{n-2}}{\text{medium} - (sO)_l^{n-3} \;\Big|\; \text{quality} - (oS)_m^{n-4}}$$

$$\text{with } (sO) < (oS) < (oO) < (sS)$$

The hierarchical quadralectic diamond of epistemological distinctions insist on a (linearly) ordered universe of its epistemological constituents but tries to keep a

kind of an operational balance of the constituents.
In contrast, the heterarchical quadralectic diamond of epistemological distinctions, with all values equal for n, insists on the ‘metaphysical’ sameness, i.e. equi-valence of its constituents.

This is called by Heidegger “*Gleichursprünglichkeit*” ("equiprimordiality (Dreyfus)). Quadralectic diamonds of distinctions are playing with the equi-primordiality of the distinctions of quadralectic polycontexturality.

Each primordial distinction of the tetradic constellation, marked as a matrix, is opening up the framework of a calculus of the domain of such a distinction. Therefore, at each place of the matrix, a distinctional calculus has to be implemented. In other words, the marks which are building the matrix of the framework, are not themselves involved into the calculi they enable. Otherwise it would be possible to eliminate the matrix by the application of its distinctions. Thus, the primordial distinction, building the matrix, are the conditions of the possibility of systems of distinctions.

This difference in the double function of distinctions as enabeling systems or modi of distinction and as being part of a distinctional calculus is not reflected in the Calculus of Indication (G. Spencer Brown).

Toth gives a complete combinatorial description of all terms involved in the quadralectics of the primordial terms (sO), (oS), (oS), (sS).

Also Toth’s new semiotic approach is fundamentally designed as an action system, a “*handlungstheoretische Semiotik*” we are still missing an operational definition and a formal apparatus which would be able to generate the different quadralectic semiotic constellations of the actional systems.
The formal terminology of the quadralectics (Kent Palmer) of a *Diamond Calculus* might be involved for a first step towards an operational implementation of quadralectic semiotics

.
The terms (sO), (oS), (oS), (sS) shall be considered as the constituents of a quadralctic diamond and building a generative system (Erzeugenden System) for the interaction and reflection of such systems.

1.2.2. Four-foldness and action-orented semiotics (Heinrichs)

Not all approaches to 4-foldedness are quadralectic. Some are based on a kind of a quaternary relation logic, and therefore part of First-Order Logic (FOL). As consequence of such a FOL based approach, there is nothing like a quiprimordiality involved. FOL is based on a dichotomic and dyadic epistemology, and is therefor not able to offer a fundament for a quadralectic approach. Nevertheless, there are interesting studies avaiable which might be used as modeling material for quadralectic elaborations.

The so called “handlungs- und reflexionstheoretische Semiotik” of Johannes Heinrichs is a well elaborate example of such an approach. But there is a big difference between the proposed claim and its conceptual realization.

his is not an easy task, and it is not yet clear if Toth’s approach is definitively surpassing the triadic/trichotomic obstacles towards a quadralectic semiotics.

1.2.3. Toth’s epistemological approach to four-foldness

In a further crucial step Toth is interpreting the ‘epistemological’ configurations with the help of Conway's “surreal numbers".

> "Since the action schemata of the 4 *monadic* semiotic partial relations
>
> (sO), (oS), (oO), (sS)
>
> as well as of the 15 *dyadic* semiotic partial relations
>
> ((sO), (oS)); ((sO), (oO)); ((sO), (sS)); ((oS), (sO)); ((oO), (sO));
> ((sS), (sO)); ((oS), (oS)); ((oS), (oO)); ((oS), (sS)); ((oO), (oS));
> ((oO), (oO)); ((oO), (sS)); ((sS), (oS)); ((sS), (oO)), ((sS), (sS)).
>
> are trivial, we restrict ourselves here to show up the 24 triadic and the 24 tetradic semiotic partial relations for all 15 pre-semiotic sign classes and their reality thematics together with the semiotic contextures from a 4-contextural 4-adic semiotic matrix. “
>
> "Tetradic semiotic-logical partial relations :
>
> ((sS), (oO), (oS), (sO)); ((oO), (sS), (oS), (sO)); ((oO), (oS), (sS), (sO));
> ((oS), (oO), (sS), (sO)); ((sS), (oS), (oO), (sO)); ((oS), (sS), (oO), (sO));
> ((oO), (sS), (sO), (oS)); ((sS), (oO), (sO), (oS)); ((oO), (oS), (sO), (sS));
> ((oS), (oO), (sO), (sS)); ((sS), (oS), (sO), (oO)); ((oS), (sS), (sO), (oO));
> ((oO), (sO), (sS), (oS)); ((sS), (sO), (oO), (oS)); ((oO), (sO), (oS, (sS));
> ((oS), (sO), (oO), (sS)); ((sS), (sO), (oS), (oO)); ((oS), (sO), (sS), (oO));
> ((sO), (oO), (sS), (oS)); ((sO), (sS), (oO), (oS)); ((sO), (oS), (oO), (sS));
> ((sO), (oO), (oS), (sS)); ((sO), (sS), (oS), (oO)); ((sO), (oS), (sS), (oO)).

(Toth, Surreale Nacht, p. 7)
http://mathematical-semiotics.com/pdf/Surreale%20Nacht.pdf

Diamond category theory might offer the appropriate structure to define and analyse Toth's epistemological approach. On the other hand, the quadralectic diamond might be easier to apply and to generate the 4-foldness of action-oriented semiotics. Because the diamond calculus is offering only the abstract mechanism of transformations and not the specifications for concrete operations, say on the semiotics of 'surreal numbers', the specifics have to be defined additionally to the abstract diamond.

Subject/object differences are *distinctions* that have to be realized by cognitive and volitive actions. In the context of Toth's actional semiotics all 4 distinctions are holding together, and building therefore a 4-fold or quadralectic structure. The internal relationality of this structure might be conceived as a diamond structure. This interpretation had been elaborated at *"Triadic Diamonds"* as a concretization of Gunther's founding relations between actional distinctions albeit considered in a triadic and not yet in a tetradic setting. It has to be strongly emphasized that triadic and tetradic distinctions are not related to n-ary relations of classical relational logic of First-Order Logic (FOL).
http://www.thinkartlab.com/pkl/lola/Triadic%20Diamonds/Triadic%20Diamonds.html

1.2.4. Toth's epistemological four-foldness

Equiprimordial distinctions

(SEM): semiotics : n
(sS): interpretant! ___Thirdness (I) __ _ ┘ : n – 1
(oO): object! ___ ___ Secondness (O) ___ _ └ : n – 2
(sO): medium! ___ __Firstness (M) _ _ ┐ : n – 3
(oS): quality! ___ ___Zeroness (Q) ___ ┌ : n – 4

Internal structure of the epistemological distinction system $SEM = [sS,\ oO,\ sO,\ oS]$:

Diamond structure of $\left[\text{sS, oO, sO, oS}\right]$

$$\begin{array}{ccccccc}
(\text{sS})_3 \cong & (\text{sS})_1 & \longrightarrow & (\text{oO})_1 & \cong & (\text{oO})_4 \\
\downarrow & \updownarrow & X & \updownarrow & & \uparrow \\
(\text{sO})_3 \cong & (\text{sO})_2 & \longleftarrow & (\text{oS})_2 & \cong & (\text{oS})_4
\end{array}$$

$$(\text{sO}) < (\text{oS}) < (\text{oO}) < (\text{sS})$$

$$(\text{oO}) == > (\text{sS, oS, oO, sO}) \,||\, (\text{oS, sS, sO})$$
$$(\text{sS}) == > (\text{sS, oS, oO, sO}) \,||\, (\text{oS, oO, sO})$$
$$(\text{oS}) == > (\text{sS, oS, oO, sO})) \,||\, (\text{sS, oO, sO})$$
$$(\text{sO}) == > (\text{sS, oS, oO, sO})) \,||\, (\text{sS, oS, oO})$$

At first there are specific diamond distictional transformation of the quadralectics.

An example might demonstrate the mechanism.

1.2.5. Quadralectic approach

Quadralectic definitions of semiotic constituents

$$\text{interpretant}-_{\mathrm{i}}^{\mathrm{n}} = \frac{\text{interpretant}-_{j}^{n+1} \mid \text{object}-_{k}^{n-1}}{\text{medium}-_{l}^{n-1} \mid \text{quality}-_{m}^{n-2}},$$

$$\text{object}-_{\mathrm{k}}^{\mathrm{n}} = \frac{\text{interpretant}-_{j}^{n+1} \mid \text{object}-_{k}^{n+2}}{\text{medium}-_{l}^{n} \mid \text{quality}-_{m}^{n-1}},$$

$$\text{medium}-_{\mathrm{l}}^{\mathrm{n}} = \frac{\text{interpretant}-_{j}^{n+1} \mid \text{object}-_{k}^{n}}{\text{medium}-_{l}^{n+2} \mid \text{quality}-_{m}^{n-1}},$$

$$\text{quality}-_{\mathrm{m}}^{\mathrm{n}} = \frac{\text{interpretant}-_{j}^{n+2} \mid \text{object}-_{k}^{n+1}}{\text{medium}-_{l}^{n+1} \mid \text{quality}-_{m}^{n+3}}.$$

A quadralectic distinction of the distinctional semiotics might be defined by:

$$\lfloor \text{semiotics}_{j}^{n} : \text{semiotics}_{j}^{n} \longrightarrow \text{semiotics}_{j}^{n+1} :$$

$$\lfloor \text{semiotics}_{j}^{n} = \left\lfloor \frac{\text{interpretant}-(\text{sS})_{j}^{n-1} \mid \text{object}-(\text{oO})_{k}^{n-2}}{\text{medium}-(\text{sO})_{l}^{n-2} \mid \text{quality}-(\text{oS})_{m}^{n-3}} \right.$$

canonical hierarchical complexion of epistemological forms

$\text{semiotics}_j^n \; =$

<table>
<tr><td rowspan="2">$\text{interpretant} - \left(\text{sS}\right)_j^n$</td><td>$\text{interpretant} - \left(\text{sS}\right)_j^{n-1}$</td><td>$\text{object} - \left(\text{oO}\right)_k^{n-2}$</td></tr>
<tr><td>$\text{medium} - \left(\text{sO}\right)_l^{n-2}$</td><td>$\text{quality} - \left(\text{oS}\right)_m^{n-3}$</td></tr>
<tr><td>$\text{medium} - \left(\text{sO}\right)_l^n$</td><td colspan="2">$\text{quality} - \left(\text{oS}\right)_m^n$</td></tr>
</table>

$\text{semiotics}_j^n \; =$

<table>
<tr><td>$\text{interpretant} - \left(\text{sS}\right)_j^{n+1}$</td><td>$\text{object} - \left(\text{oO}\right)_k^n$</td></tr>
<tr><td>$\text{medium} - \left(\text{sO}\right)_l^n$</td><td>$\text{quality} - \left(\text{oS}\right)_m^{n-1}$</td></tr>
</table>

1.2.6. Formal modeling of quadralectics

$$\text{semiotics}_j^n = \frac{\begin{array}{c|c}(\text{sS})_j^{n-1} & (\text{oO})_k^{n-2}\end{array}}{\begin{array}{c|c}(\text{sO})_l^{n-2} & (\text{oS})_m^{n-3}\end{array}}$$

$$\left\lfloor \text{semiotics}_j^n \right. = \left\lfloor \frac{\begin{array}{c|c}(\text{sS})_j^{n-1} & (\text{oO})_k^{n-2}\end{array}}{\begin{array}{c|c}(\text{sO})_l^{n-2} & (\text{oS})_m^{n-3}\end{array}} \right. =$$

$$\begin{array}{c|c}(\text{sS})_j^{n-1} & \left\lfloor \frac{\begin{array}{c|c}(\text{sS})_j^{n-1} & (\text{oO})_k^{n-2}\end{array}}{\begin{array}{c|c}(\text{sO})_l^{n-2} & (\text{oS})_m^{n-3}\end{array}} \right. \\ \hline (\text{sO})_l^{n-2} & (\text{oS})_m^{n-3}\end{array} \;. = \frac{\begin{array}{c|c}(\text{sS})_j^{n+1} & (\text{oO})_k^{n}\end{array}}{\begin{array}{c|c}(\text{sO})_l^{n} & (\text{oS})_m^{n-1}\end{array}}$$

Permutations

$$\text{perm}\left(\text{SEM}_j^n\right) = \text{perm}\left(\frac{\begin{array}{c|c}(\text{sS})_j^{n+1} & (\text{oO})_k^{n}\end{array}}{\begin{array}{c|c}(\text{sO})_l^{n} & (\text{oS})_m^{n-1}\end{array}}\right)$$

Superpositions

Following the demonstration by Richard Howe we get for our superpositions on the operators "$\lfloor$" and "$\rceil$" for (sO) and (oS) the following quadralectic transformations :

For example if :

$$\text{semiotics}_j^n = \frac{\begin{array}{c|c}(\text{sS})_j^{n-1} & (\text{oO})_k^{n-2}\end{array}}{\begin{array}{c|c}(\text{sO})_l^{n-2} & (\text{oS})_m^{n-3}\end{array}}$$

then by double superposition

$$\left\lfloor \overline{\text{semiotics}_j^n}\,\right\rceil =$$

$$\left\lfloor \overline{\begin{array}{c|c} (sS)_j^{n-1} & (oO)_k^{n-2} \\ \hline (sO)_l^{n-2} & (oS)_m^{n-3} \end{array}} \right\rceil = \begin{array}{c|c} (sS)_j^{n-1} & \left\lfloor (oO)_j^{n-2} \right. \\ \hline \left. \overline{(sO)_m^{n-2}} \right| & (oS)_m^{n-3} \end{array}$$

and by extension of the boundary sides

of the superposition operators $\lfloor$, $\rceil$ on

semiotics $\left\lfloor \overline{\text{semiotics}_j^n}\,\right\rceil$, which is :

$$\begin{array}{c|c} (sS)_j^{n-1} & \left. \begin{array}{c|c} (sS)_j^{n-1} & (oO)_k^{n-2} \\ \hline (sO)_l^{n-2} & (oS)_m^{n-3} \end{array} \right|_k^{n-2} \\ \hline \left. \begin{array}{c|c} (sS)_j^{n-1} & (oO)_k^{n-2} \\ \hline (sO)_l^{n-2} & (oS)_m^{n-3} \end{array} \right|_l^{n-2} & (oS)_m^{n-3} \end{array}$$

that condenses to :

$$\left\lfloor \overline{\text{semiotics}_j^n}\,\right\rceil = \begin{array}{c|c} (sS)_j^{n+3} & (oO)_k^{n+2} \\ \hline (sO)_l^{n+2} & (oS)_m^{n+1} \end{array} \;\bullet$$

Examples

General

$$\text{semiotics}^{n}_{\text{SEM}} = \frac{(sS)^{n-1}_{j} \;\Big|\; (oO)^{n-2}_{k}}{(sO)^{n-2}_{l} \;\Big|\; (oS)^{n-3}_{m}}$$

Special : n = 4

Quadralectic structure :

$$\text{semiotics}^{4}_{\text{SEM}} = \frac{(sS)^{3}_{j} \;\Big|\; (oO)^{2}_{k}}{(sO)^{2}_{l} \;\Big|\; (oS)^{1}_{m}}$$

Epistemological system :

$$\text{semiotics}^{4}_{\text{SEM}} = \left[(sS)^{3}, (oO)^{2}, (sO)^{2}, (oO)^{1}\right].$$

n = 5 :

Epistemological systems :

$$\text{succ} : \text{semiotics}^{4}_{\text{SEM}} \longrightarrow \text{semiotics}^{5}_{\text{SEM}} :$$

$$\text{succ}\left[(sS)^{3}, (oO)^{2}, (sO)^{2}, (oO)^{1}\right] :$$

$$\text{semiotics}^{5}_{sS} =$$

$$\left[\left[(sS)^{3}, (oO)^{2}, (sO)^{2}, (oO)^{1}\right]^{3}, (oO)^{2}, (oO)^{1}\right] = \left[(sS)^{6}, (oO)^{5}, (sO)^{5}, (oO)^{4}\right]$$

$$\text{semiotics}^{5}_{oO} =$$

$$\left[\left[(sS)^{3}, \left[(sS)^{3}, (oO)^{2}, (sO)^{2}, (oO)^{1}\right]^{2}, (sO)^{2}, (oO)^{1}\right] = \left[(sS)^{5}, (oO)^{4}, (sO)^{4}, (oO)^{3}\right]$$

$$\text{semiotics}^{5}_{\text{sO}} =$$

$$\Big[\big[(\text{sS})^{3}, (\text{oO})^{2}, \big[(\text{sS})^{3}, (\text{oO})^{2}, (\text{sO})^{2}, (\text{oO})^{1}\big]^{2}, (\text{oO})^{1}\big] = \big[(\text{sS})^{5}, (\text{oO})^{4}, (\text{sO})^{4}, (\text{oO})^{3}\big]$$

$$\text{semiotics}^{5}_{\text{oS}} =$$

$$\big[(\text{sS})^{3}, (\text{oO})^{2}, (\text{sO})^{2}, \big[(\text{sS})^{3}, (\text{oO})^{2}, (\text{sO})^{2}, (\text{oO})^{1}\big]^{1}\big] = \big[(\text{sS})^{4}, (\text{oO})^{3}, (\text{sO})^{3}, (\text{oO})^{2}\big]$$

1.2.7. Recursive quadralectics

$$\text{succ}: \text{semiotics}^{4}_{\text{SEM}} \longrightarrow \text{semiotics}^{5}_{\text{SEM}}:$$

$$\left.\underline{\text{semiotics}^{5}_{\text{sS}}}\right| = \begin{array}{c|c} \begin{array}{c|c} (\text{sS})^{3}_{j} & (\text{oO})^{2}_{k} \\ \hline (\text{sO})^{2}_{l} & (\text{oS})^{1}_{m} \end{array} & (\text{oO})^{2}_{k} \\ \hline (\text{sO})^{2}_{l} & (\text{oS})^{1}_{m} \end{array} = \begin{array}{c|c} (\text{sS})^{6}_{j} & (\text{oO})^{5}_{k} \\ \hline (\text{sO})^{5}_{l} & (\text{oS})^{4}_{m} \end{array}$$

$$\left|\underline{\text{semiotics}^{5}_{\text{oO}}}\right. = \begin{array}{c|c} (\text{sS})^{3}_{j} & \begin{array}{c|c} (\text{sS})^{3}_{j} & (\text{oO})^{2}_{k} \\ \hline (\text{sO})^{2}_{l} & (\text{oS})^{1}_{m} \end{array} \\ \hline (\text{sO})^{2}_{l} & (\text{oS})^{1}_{m} \end{array} = \begin{array}{c|c} (\text{sS})^{5}_{j} & (\text{oO})^{4}_{k} \\ \hline (\text{sO})^{4}_{l} & (\text{oS})^{3}_{m} \end{array}$$

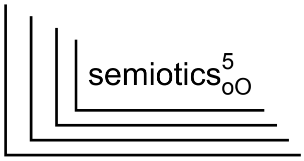
$$\left.\overline{\text{semiotics}^{5}_{\text{sO}}}\right| = \begin{array}{c|c} (\text{sS})^{3}_{j} & (\text{oO})^{2}_{k} \\ \hline \begin{array}{c|c} (\text{sS})^{3}_{j} & (\text{oO})^{2}_{k} \\ \hline (\text{sO})^{2}_{l} & (\text{oS})^{1}_{m} \end{array} & (\text{oS})^{1}_{m} \end{array} = \begin{array}{c|c} (\text{sS})^{5}_{j} & (\text{oO})^{4}_{k} \\ \hline (\text{sO})^{4}_{l} & (\text{oS})^{3}_{m} \end{array}$$

$$\ulcorner \text{semiotics}^{5}_{\text{oS}} = \begin{array}{c|c} \left(\text{sS}\right)^{3}_{j} & \left(\text{oO}\right)^{2}_{k} \\ \hline \left(\text{sO}\right)^{2}_{l} & \begin{array}{c|c} \left(\text{sS}\right)^{3}_{j} & \left(\text{oO}\right)^{2}_{k} \\ \hline \left(\text{sO}\right)^{2}_{l} & \left(\text{oS}\right)^{1}_{m} \end{array} \end{array} = \begin{array}{c|c} \left(\text{sS}\right)^{4}_{j} & \left(\text{oO}\right)^{3}_{k} \\ \hline \left(\text{sO}\right)^{3}_{l} & \left(\text{oS}\right)^{2}_{m} \end{array} \bullet$$

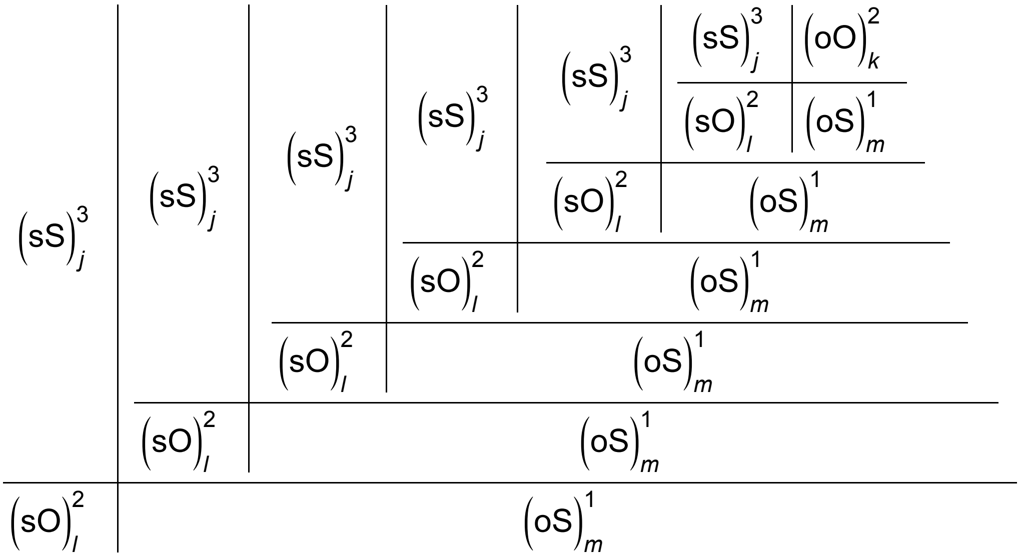
$$\begin{bmatrix} \text{semiotics}^{5}_{\text{SEM}} \end{bmatrix} =$$

$$\begin{array}{c||c} \left(\text{sS}\right)^{3}_{j} \lrcorner & \llcorner \left(\text{oO}\right)^{2}_{k} \\ \hline \left(\text{sO}\right)^{2}_{l} \urcorner & \ulcorner \left(\text{oS}\right)^{1}_{m} \end{array} = \begin{array}{c|c} \left(\text{sS}\right)^{5}_{j} & \left(\text{oO}\right)^{4}_{k} \\ \hline \left(\text{sO}\right)^{4}_{l} & \left(\text{oS}\right)^{3}_{m} \end{array} \bullet$$

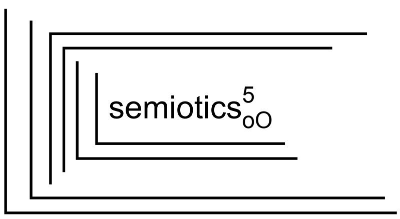
Iterations



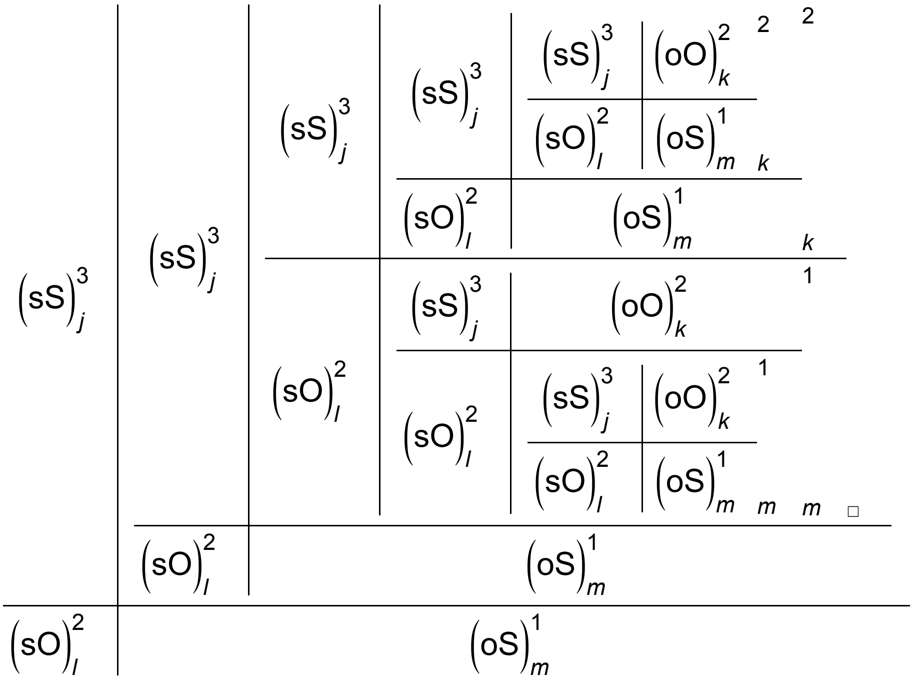
=



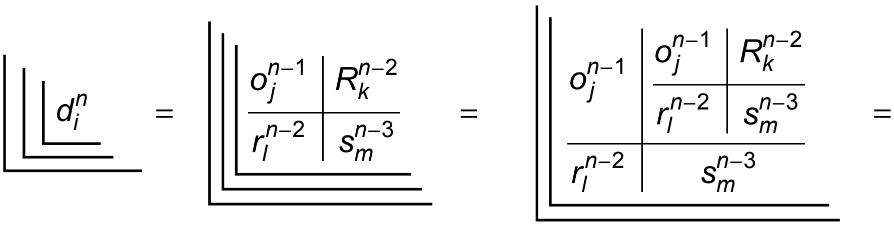
$$= \begin{array}{c|c} (sS)_j^{11} & (oO)_k^{10} \\ \hline (sO)_l^{10} & (oS)_m^{9} \end{array}$$

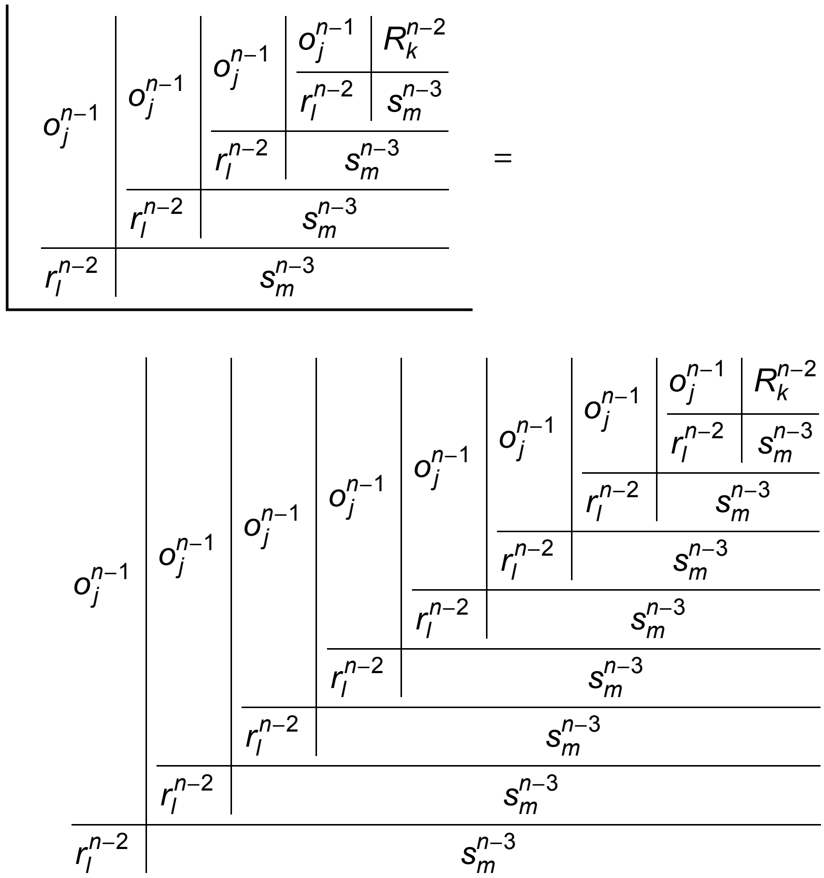


=

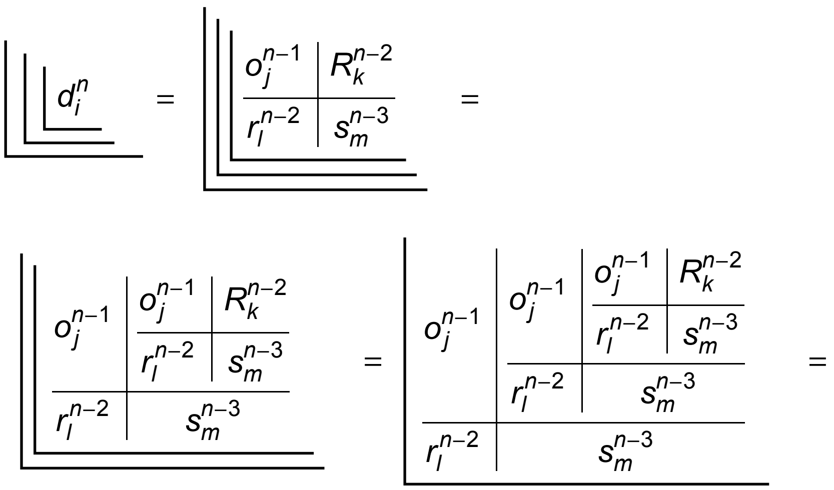

$(sS)_j^3$
$(oO)_k^2$
$(sO)_l^2$
$(oS)_m^1$

recursion :


d_i^n
=
o_j^{n-1}
R_k^{n-2}
r_l^{n-2}
s_m^{n-3}
=
o_j^{n-1}
o_j^{n-1}
R_k^{n-2}
r_l^{n-2}
s_m^{n-3}
r_l^{n-2}
s_m^{n-3}
=



partial iteration :



$$\begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & R_k^{n-2} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} =$$

$$\begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & R_k^{n-2} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} =$$

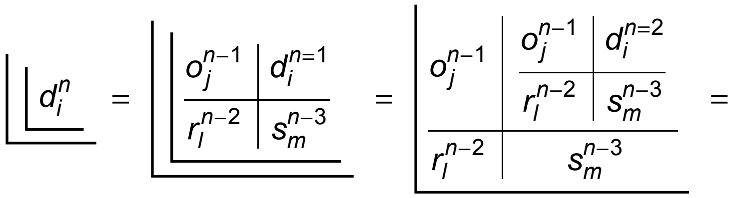
$$\begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & \begin{array}{c|c} o_j^{n-1} & R_k^{n-2} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array} .$$

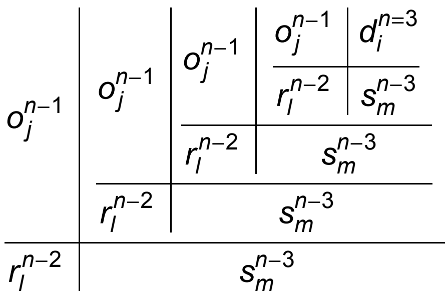
Recursion from $n = 1$ to $n = 3$

Start : $n = 1$

$$d_i^{n=1} = \begin{array}{c|c} o_j^{n-1} & d_i^{n} \\ \hline r_l^{n-2} & s_m^{n-3} \end{array}$$

$n = 3$:





1.3. Polycontexturality of thematization

1.3.1. From distinction to thematization

Quadralectics deals with the 4-fold structure of distinction systems. Insofar, all distinctions are performed inside the contexture of 4-fold distinctionality.
Quadralectics therefore might be thematized as a mono-contextural system or structure of distinctions.
It might also be thematized as a polycontextural system consiting of four equiprimordial distinctions each configuring a contexture.
Becaus of the proemiality of contextural systems such interplays are natural and are not giving reasons for conflics ot contradictions.

Hence, a theory of meta-distinctions is at place to thematize distinctional systems. In other words, olycontextural distinctions or meta-distinctions are distinctions between contextures and the results of thematization.
Thematization is the process of creative understanding.

A first topic obviously is the dissemination of distinction systems and the study of their behavior.
A second topic is the study of enaction and its memristive properties in polycontextural constellations of quadralectic distinction systems.

What are actions on ‘equiprimordial’ elements of the quadralectic matrix? Obviously, they are not distinctions in the sense of the Calculus of Indication (CI) of the Laws of Form. Otherwise the double cross action would annihilate the matrix and eliminate the distinctions like in the case of the GSP double cross ┐┐ ⇄ ∅.

The quadralectic matrix is the framework of epistemological reflection of distinction systems

Hence, the operational system of description
with:

```
observe! ____ ____ ____ ____ _ ┘
represent! ____ ____ ____ ___ └
relate! ____ ____ ____ ____ ___ ┐
structure! ____ ____ ____ ____ ┌
```

is not to understand in an indicational way. Albeit Howe is not explaining his matrix epistemologically, an observation of an observation, ┘┘, or a relation of a relation, ┐┐, is not indicating a reduction to nil, but an elevation to a higher order of epistemological reflection.

Just as a rhetorical remark: Albeit that those typographic exercises might be recognized by the experts as an utter brain-fuck, it wouldn't be a superfluous recommendation to check the miserability of the distinctions used in corresponding scientific endeavours.

A simple interpretation might hint to the possibility to understand isolated societal agents as self-reflexive systems with quadralectic properties of cognitive/volitive behavior towards their environment. With the presupposition that for a social system, or society, a singular self-reflexive agent is not yet enabling neither the existence of itself nor the existence of a societal system, a multitude of interacting, reflecting and intervening quadralectic agents have to be involved to run the game.

Hence, the epistemological and semiotic quadralectic of [(sS), (oS), (sO, (oO)] is not defining a societal system but a singular reflexive agent of a society. A society has at least to disseminate such quadralectic agents to build a society.

With the design of the quadralectic observer model there was probably some hope to realize it for a multitude of agents by a recursive repetition of the quadralectic structure of the distinction scheme, say in the sense that a structure of structure! might contain a full system with its own command structure!. But this happens in a singular framework of quadralectic distinction and the option to distribute the whole scheme as such over different loci is not yet recognized. In this sense, there is no fundamental difference between recursive repetitions of dyadic or triadic configurations.

At a first glace the scheme is a quadralectic structure but by a secaond glace it uncovers itself as a pentalectic system with d for the whole as description $d^n_j = \frac{o^{n-1}_j \;\vert\; R^{n-2}_k}{r^{n-2}_l \;\vert\; s^{n-3}_m}$. Hence, [d; o, R, r, s]. Howe’s last paragraph hints to an ultimate state of (solipsitic) recursivity: *“and finally the o elements are brought to the n-n=0 level, and drop out, leaving the expression*:
$\mathbf{d}^1_i \equiv \underline{(o\ ^{\circ})}\rfloor \equiv$ ***observe!*** "(Howe, 1970).

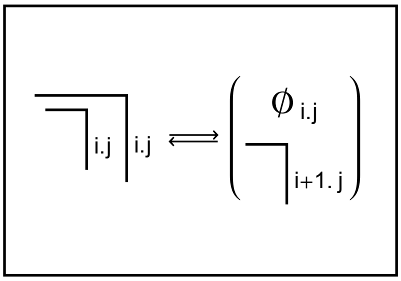
1.3.2. Dissemination of distinctional systems

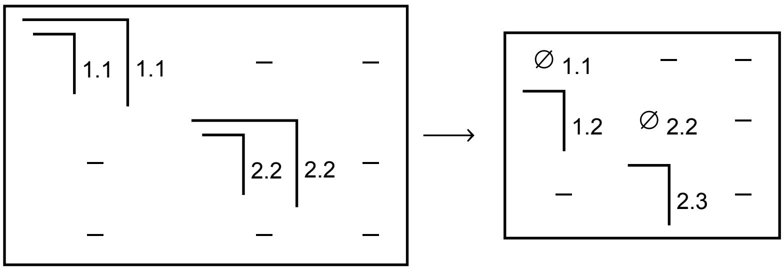
$$\begin{array}{ccc}
\left.\begin{array}{c|c} (sS)^{n-1}_j & (oO)^{n-2}_k \\ \hline (sO)^{n-2}_l & (oS)^{n-3}_m \end{array}\right|_{1.1} & - & - \\
- & \left.\begin{array}{c|c} (sS)^{n-1}_j & (oO)^{n-2}_k \\ \hline (sO)^{n-2}_l & (oS)^{n-3}_m \end{array}\right|_{2.2} & - \\
- & - & \begin{array}{c|c} (sS)^{n-1}_j & (oO)^{n-2}_k \\ \hline (sO)^{n-2}_l & (oS)^{n-3}_m \end{array}
\end{array}$$

1.3.3. Enaction in quadralectics

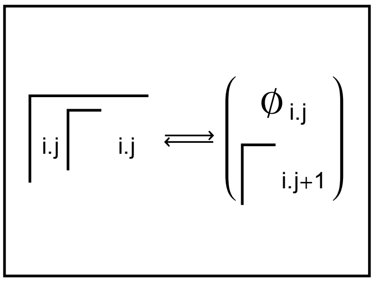
An operation like enaction which is shifting its object from one contexture to another obviously is possible only in a polycontextural framework.

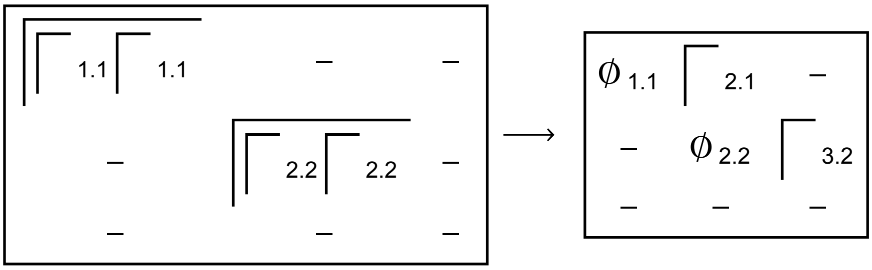
Reflectional enactions





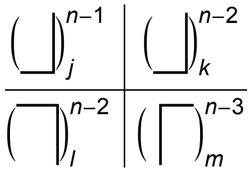
Interactional enactions

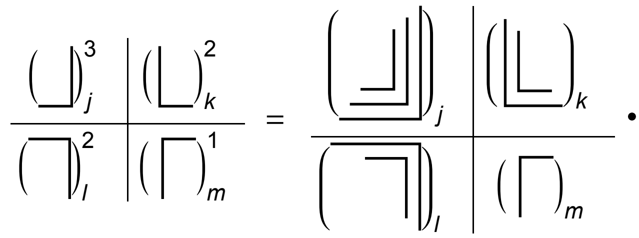


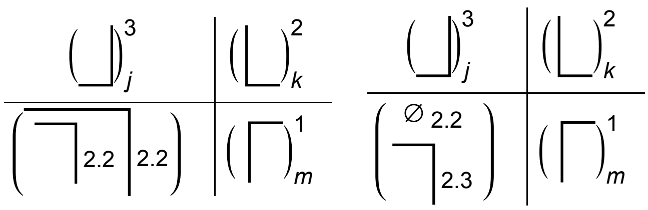


Quadralectic r eflectional enactions

canonical form for quadralectics

$q_j^n =$ 

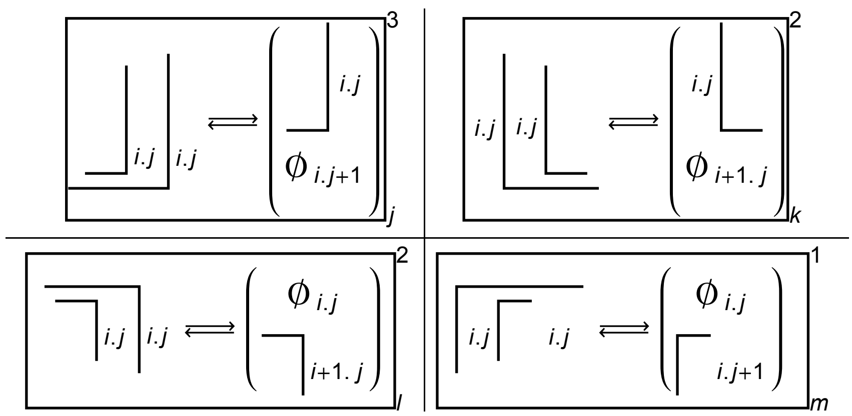
quadralectics$^4_{dist}$ = 

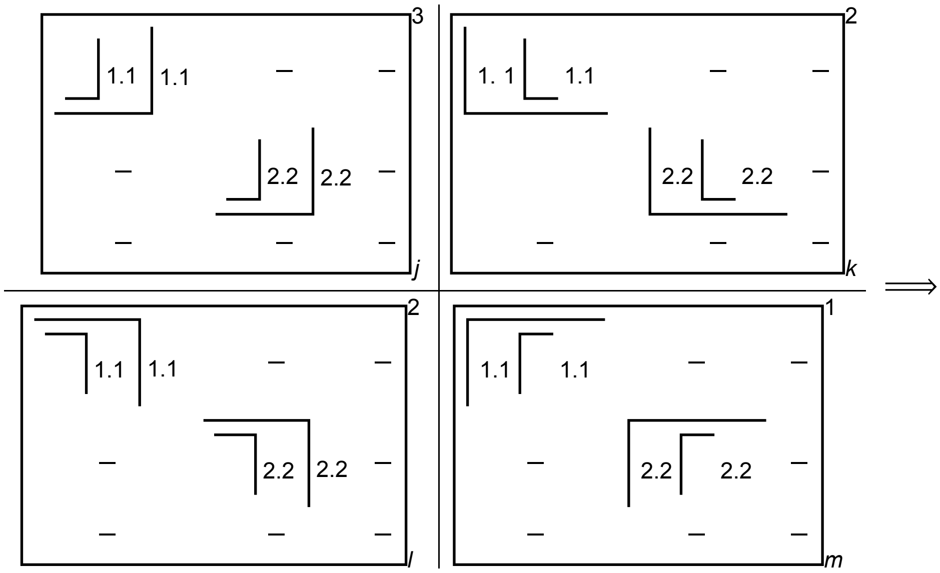


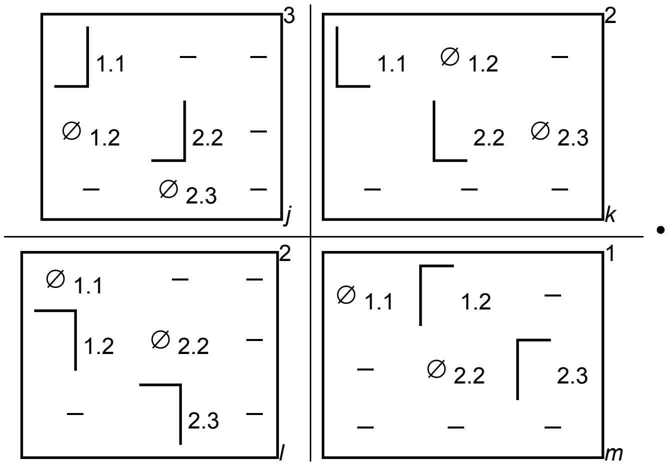
Quadralectic enaction :

Example of 3 – contextural quadralectical

enaction $\overset{5}{oO}$ with $j = k = l = m$: 3 – contextural :

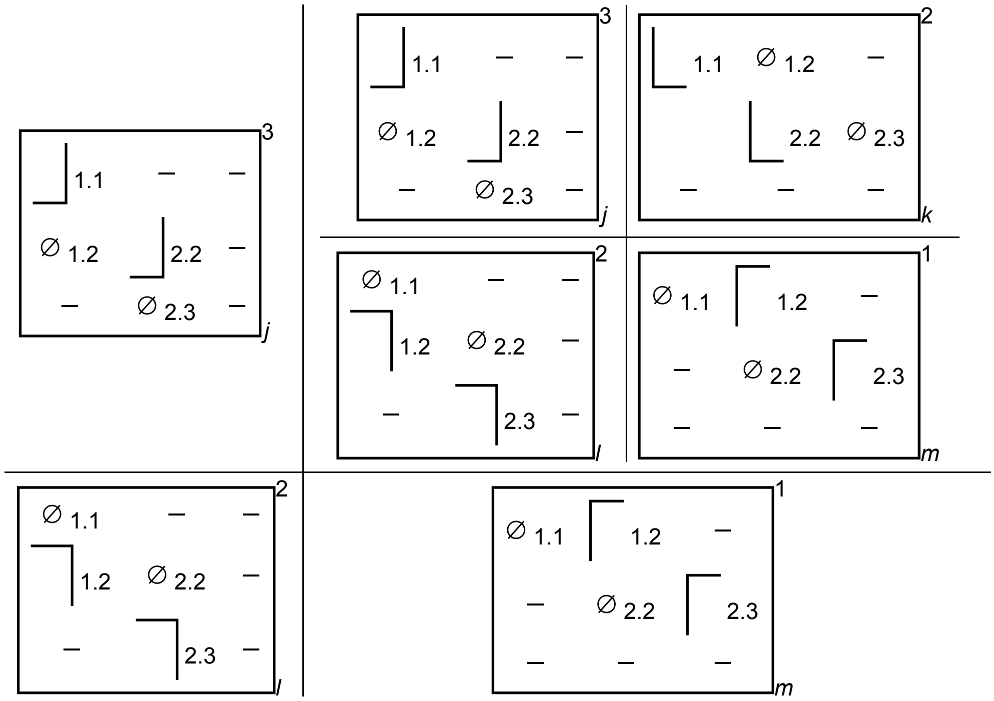


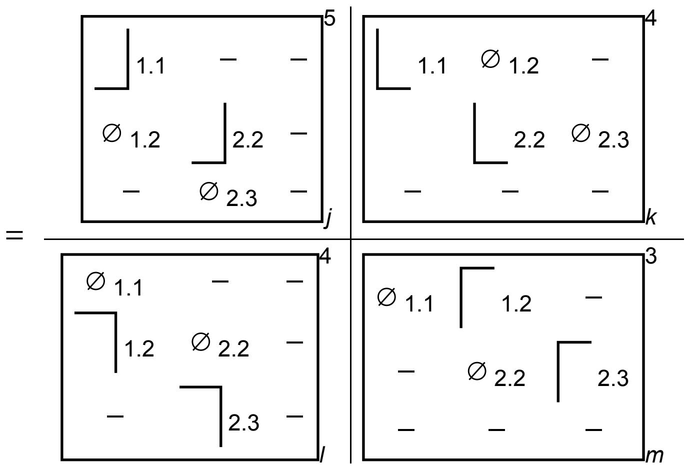




$3 - \mathrm{enaction}^{5}_{oO} \;=$

$j = k = l = m\,:\ 3-$contextural





1.4. Quadralectic metamorphosis

Up to now the entities of quadralectic operations had been stable in their definition. Hence, in *a* quadralectic configuration like

interpretant $-\left(sS\right)_j^{n-1}$	object $-\left(oO\right)_k^{n-2}$
medium $-\left(sO\right)_l^{n-2}$	quality $-\left(oS\right)_m^{n-3}$

all entities, (sS), (oO), (sO) and (oS), or their semiotic interpretations as interpretant, object, medium and quality, are stable, i.e. they are all defined in the mode of the is - abstraction : X is X. And nothing else.

But this stability of entities is quite unrealistic. It starts with the elements themselves : an "object" (oO) might be an object for itself simply because it is presumed that an object has as an object no reflectional capabilities. But as we know from reflection theory, a "subjective subject" might be discovered by a reflection of the subjective subject on itself that it is not a "sS" but an "objective subject" (oS) for the observing subjective subject (sS). And even more surprisingly, all other subjective subjects might not be recognized by a subjective subject as (sS) but only as objective subjects (oS). In other words, in an epistemology of *I, You, It*, for an *I* (ego), all other *I*s (egos) appear not themselves as Is but as Thous.

This is just the intrinsic condition of the quadralectic elements. From an operational point of view, new operators are accessible. A subjective subject might encounter a objective subject as an objective object, say in an act of objectification of subjectivity. In another scenario, an object subject might mystifying an objective object as a subjective subject or at least as an objective subject. And so on. All possibilities seems to be meaningful.

Therefore, the operation of *metamorphosis* as outlined in other papers, is reasonably applied to quadralectic diamonds.

There are some interesting possibilities to involve quadralectic notions into a metamorphic change.

First, based on the as - abstraction:

From (sS) as (sS) to (sS) as (oO), exactly 24 permutations of the elements (sS), (oO), (sO) and (oS) are possible. This has been studied by Gunther and Toth under the premise of *negation* and *permutation* but not in respect to their involvement into metamorphosis by as-abstractions.

Second, based on iteration:

A further interesting change of the definition of the quatralectic elements might be achieved with internal iterations : from (sS) to (sSS), and from (oS) to (oSS). But also, from (sS) to (ssS). And so on. Iterations in the subjective realm seems to be easier accepted than iterations in the objective realm, i.e. transitions from (sO) to (sOO) and from (oO) to (oOO). But there are no conceptual and formal reasons to stop with a subjectivistic interpretation of quadralectics.

1.5. Quadralectic notations

The quadralectic (tetralemmatic, diamond) notation is enabling operations on the parts of the diamond complexions consisting of *Inside*, *Outside* and *inside*, *outside,* i.e. [[*A* | *a*] | [*a* | *A*]], short: [*a* | *A* | *a*].

Those operations applied to the quadralectic complexion have to preserve the rules of retrograde recursivity.

[[*A* | *a*] | [*a* | *A*]]:

[Inside | Outside] **|** [outside| inside]:

[*Inside* of inside | *Outside* of inside] | [*outside* of Outside | *inside* of Outside].

canonical hierarchical complexion of forms

$$d_i^n = \frac{\text{Outside} - o_j^{n-1} \;\Big|\; \text{Inside} - R_k^{n-2}}{\text{inside} - r_l^{n-2} \;\Big|\; \text{outside} - s_m^{n-3}}$$

local iterations

$$d_i^n = \frac{\underline{a}\,\big| - o_j^{n-1} \;\Big|\; \big|\underline{A} \; - R_k^{n-2}}{\overline{A}\,\big| - r_l^{n-2} \;\Big|\; \big|\overline{a} \; - s_m^{n-3}}$$

local iterations

$$\big|\underline{\;\;} \; d_i^n = \frac{\underline{a}\,\big| - o_j^{n-1} \;\Bigg|\; \dfrac{\underline{a}\,\big| - o_j^{n-1} \;\Big|\; \big|\underline{A} \; - R_k^{n-2}}{\overline{A}\,\big| - r_l^{n-2} \;\Big|\; \big|\overline{a} \; - s_m^{n-3}}}{\overline{A}\,\big| - r_l^{n-2} \;\Bigg|\; \big|\overline{a} \; - s_m^{n-3}}$$

Reduction

$$\big|\underline{d_i^n} = \frac{\underline{a}\,\big| - o_j^{n+1} \;\Big\|\; \big|\underline{A} \; - R_k^{n}}{\overline{A}\,\big| - r_l^{n} \;\Big\|\; \big|\overline{a} \; - s_m^{n-1}} .$$

1.6. Frame of Diamond Semiotics, completed?

Quadralectic Diamond – Semiotics

firstness : $\left[a \middle| A \middle| a\right]$

secondness : $\left[b \middle| B \middle| b\right] \Big| \left[c \middle| C \middle| c\right].$

thirdness : $\left[c \middle| C \middle| c\right] \Big| \left[b \middle| B \middle| b\right]_1 \longleftarrow \left[b \middle| B \middle| b\right]_2$

fourthness : $\left[a \middle| A \middle| a\right] \longrightarrow \left[d \middle| D \middle| d\right] \Big| \left[b \middle| B \middle| b\right]_1 \longleftarrow \left[b \middle| B \middle| b\right]$

$_2 \; || \; \left[c \middle| C \middle| c\right]_1 \longleftarrow \left[c \middle| C \middle| c\right]_2$

zeroness : $\varnothing \big| \phi \big| \varnothing$

diam – firstness : $\boldsymbol{A} \Big| \boldsymbol{a}$

$\left[a \middle| A \middle| a\right]$

diam – secondness : $\boldsymbol{A \longrightarrow B} \Big| \boldsymbol{c}$

$\left[A \middle| a\right] \Big| \left[a \middle| A\right] \longrightarrow \left[B \middle| b\right] \Big| \left[b \middle| B\right] \; \Big| \; \left[C \middle| c\right] \Big| \left[c \middle| C\right]$, *i.e.*

$\left[a \middle| A \middle| a\right] \longrightarrow \left[b \middle| B \middle| b\right] \Big| \left[c \middle| C \middle| c\right].$

diam – thirdness : $\boldsymbol{A \longrightarrow C} \Big| \mathbf{b_1 \longleftarrow b_2}$

$\left[A \middle| a\right] \Big| \left[a \middle| A\right] \longrightarrow \left[C \middle| c\right] \Big| \left[c \middle| C\right] \; \Big| \; \Big[$

$B \big| b\big] \Big| \left[b \middle| B\right]_1 \longleftarrow \left[B \middle| b\right] \Big| \left[b \middle| B\right]_2$, *i.e.*

$$\left[a \mid A \mid a\right] \longrightarrow \left[c \mid C \mid c\right] \Big| \left[b \mid B \mid b\right]_1 \longleftarrow \left[b \mid B \mid b\right]_2.$$

$$\textbf{diam – fourthness : } \boldsymbol{A} \longrightarrow \boldsymbol{D} \Big| \mathbf{b_1} \longleftarrow \mathbf{b_2} \Big\| \mathbf{c_1} \longleftarrow \mathbf{c_2}$$

$$\left[A \middle| a\right] \left| \left[a \middle| A\right] \right. \longrightarrow \left[d \mid D \mid d\right] \Big| \left[B \middle| b\right] \left| \left[b \middle| B\right]_1 \right. \longleftarrow \Big[$$

$$B \Big| b\Big] \Big| \left[b \middle| B\right]_2 \ \| \ \left[C \middle| c\right] \left| \left[c \middle| C\right]_1 \right. \longleftarrow \left[C \middle| c\right] \left| \left[c \middle| C\right]_2 \right., \ \textit{i.e.}$$

$$\left[a \mid A \mid a\right] \longrightarrow \left[d \mid D \mid d\right] \Big| \left[b \mid B \mid b\right]_1 \longleftarrow \left[b \mid B \mid b\right]$$

$$_2 \ \| \ \left[c \mid C \mid c\right]_1 \longleftarrow \left[c \mid C \mid c\right]_2.$$