

## Building a Scaffold: Semiosis in Nature and Culture

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**Abstract** The notion of “semiotic scaffolding”, introduced into the semiotic discussions by Jesper Hoffmeyer in December of 2000, is proving to be one of the single most important concepts for the development of semiotics as we seek to understand the full extent of semiosis and the dependence of evolution, particularly in the living world, thereon. I say “particularly in the living world”, because there has been from the first a stubborn resistance among semioticians to seeing how a semiosis prior to and/or independent of living beings is possible. Yet the universe began in a state not only lifeless but incapable of supporting life, and somehow “moved” from there in the direction of being able to sustain life and finally of actually doing so. Wherever dyadic interactions result indirectly in a new condition that either moves the universe closer to being able to sustain life, or moves life itself in the direction not merely of sustaining itself but opening the way to new forms of life, we encounter a “thirdness” in nature of exactly the sort that semiotic triadicity alone can explain. This is the process, both within and without the living world, that requires scaffolding. This essay argues that a fuller understanding of this concept shows why “semiosis” says clearly what “evolution” says obscurely.

**Keywords** Action of signs · Being in futuro · Biosemiotics · Genuine · Indirect result · Influence of the future (“*vis a prospecto*”) · Interpretant · Life · Physiosemiosis · Pregenerate · Sebeok · Secondness · Semiosis · Triadic relation

A scaffold is a structure which sustains or upholds things while new levels or dimensions are added to what is already existing.<sup>1</sup> And that is just what semiosis does respecting the universe as a whole. The first one to draw this

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<sup>1</sup>Cf. among many sources *Webster's Dictionary* 1878: “To furnish with a scaffold; to sustain; to uphold.”.

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analogy was Jesper Hoffmeyer in December of 2000, where he presented a paper at Puebla University in Mexico entitled “Semiogenic Scaffolding in Nature”, which did not appear published in English until 2007, though in Danish in 2001. In an email dated 3 June 2014 hour 06:24, Jesper informed me that “already in 2002 I chose to simplify the expression [‘semiogenic scaffolding’] to just ‘semiotic scaffolding’ in my presentation at the Gatherings in Biosemiotics 2, in Tartu”.<sup>2</sup>

Now should I live long enough, which I am pretty sure will not be the case, I would like to write a book exploring the whole of Hoffmeyer’s writings on this point. For I have formed the opinion (some time ago) that Jesper’s “scaffolding” idea is to semiotics what Einstein’s  $E=mc^2$  has been to modern physics.

Now Hoffmeyer himself has developed his idea mainly in the context of biosemiotics. But my opinion is that the idea applies to the full extent of semiosis, which—again in my opinion—is broader than the realm of biosemiotics. Thus, while biosemioticians like to repeat Sebeok’s maxim that semiosis is coextensive with life, they are resistant to seeing that life is not coextensive with semiosis, and in this paper I want to indicate *why*—or perhaps I should rather say *how*—a semiosis is presupposed not only for living things to exist, but for living things to have been able in the first place to come into existence!

So that is my aim: to show how and why Hoffmeyer’s notion of semiosis as providing the scaffolding for the development of life needs also and *further* to be understood as providing the scaffolding whereby the originally lifeless universe developed in such a way as eventually to become capable of life. Presupposed here is the prior demonstration first made by John Poinset in 1632 (*Tractatus de Signis*, Book I, Question 3), then taken up independently by Charles Peirce, that semiosis or the action consequent upon the being proper to signs consists precisely in that “being” being an irreducibly triadic relation, suprasubjective, like all true relations, but necessarily involving three and not just two “terms” under that relation.

### Establishing the Full Scope of Hoffmeyer’s Notion of ‘Semiotic Scaffold’

The key to the demonstration that semiosis occurs in nature’s purely physical dimension (and therefore prior to living things) is Charles Peirce’s notion of *interpretant* (in contrast to *interpreter*),<sup>3</sup> for here is where Peirce opened the way to an understanding of semiosis at work beyond the realm of the animals by introducing the point that a relation need not be within animal awareness

<sup>2</sup> This presentation remains itself so far unpublished; but cf. Hoffmeyer and Kull 2003, Favareau, Copley, and Kull, Eds. 2012, and also Emmeche, Kull, Stjernfelt, Eds. 2002. Perhaps the most extensive treatment Hoffmeyer has given to his scaffolding idea within semiotics is his 2009 book *Biosemiotics*, while the most recent treatment is his article of 2014.

<sup>3</sup> On the history of this matter as here presupposed, see Deely 2001 for an overview and then 2009a for critical treatment in detail of the triadicity of sign relations as enabling semiosis — the action of signs consequent upon their distinctive being.

— whether the awareness of alloanimals or human animals — in order to be triadic virtually (while Poincot had already made the point that “it suffices to be a sign virtually in order to signify in act”<sup>4</sup>). But while the thinkers of Poincot’s day, including Poincot, thought of the “third term” of the sign relation as the “*potentia cognoscitiva*” or “cognitive power” of some animal (thus *interpreting* the sign as representing this or that object within its — the animal’s — awareness), Peirce had the genius to recognize that it is not the fact of an *interpreter* being involved that is essential to the relation constitutive formally of the action of signs, but simply that there be a *third term* indirectly attained along with the direct relation of the sign vehicle or “representamen”<sup>5</sup> to the object signified or “significate”.<sup>6</sup> Hence Peirce correctly asserted that the “third term” attained in the triadic sign relation “need not be of a mental mode of being”,<sup>7</sup> and hence that *there need not be an*

<sup>4</sup> Poincot 1632: TDS Book I, Question 1, 126/3–4: “... sufficit virtualiter esse signum, ut actu significet.” See my coalescence of Peirce with Poincot on this point in Deely 1989: “The Grand Vision”.

<sup>5</sup> “Representamen” (see the *Commens Dictionary* entry for this term, listed under “Representamen” in the References) was the term introduced by Peirce (e.g., Peirce 1867: W 2.55; yet unpublished ms. occurrences go back to 1866) to designate what stands in the foreground position of representing something other than itself to or for a third, and thus as a term stipulated to replace the common speech use of the term “sign” to stand for something that can be seen or pointed to, a common use which conceals the fact that what makes anything that can be sensed *be* a sign is not the thing itself but only and rather *the position it occupies within a triadic relation*. He also used the expression sign “vehicle” as a synonym for “representamen”, as naming the foreground item representing another to or for a third within the triadic or sign relation: see Deely 2009a: 84–95, esp. “10a. The Peircean Texts on the Notion of Sign Vehicle”.

In a 1905 draft for Lady Welby of a letter apparently never completed, Peirce wrote (Hardwick Ed. 1977: 193): “there was no need of this horrid long word”, i.e., “representamen” (final entry cited in the “Commens Peirce Dictionary” of the Helsinki Metaphysical Club at <<http://www.helsinki.fi/science/commens/terms/representamen.html>>). It is doubtful that Peirce would have followed through on this, as there most certainly is need of a technical term which clarifies and restricts the common use of the word “sign” for the *material* foreground element under the triadic relation constituting the sign *formally*. The arguments in favor of the term “representamen”, including Peirce’s repeated usage *both before and after* 1905 (from 1866 through 1911 at least), are considerably stronger than what Peirce himself described in 1905 as the “dreadful twaddle, garrulous chat” surrounding his tentative backpedaling from “this horrid long word” which — everywhere else in his semiotic writings — served very well indeed. Cf., e.g., Peirce 1903a: “Sundry Logical Conceptions”, esp. 272–273; also Benedict 1985, where he takes explicit account of the draft letter of July 1905.

The most important point of all to be noticed with regard to Peirce’s 1905 letter, the point *Commens* fails to take into account, is the fact that *Peirce continues to use the term ‘representamen’ right up to 1911*: see Deely 2015.

<sup>6</sup> And I would remind readers that the term “object” in fact says in an indirect and disguised way what the term “significate” says openly and unmistakably; for just as a thing need not be an object, so an object need not be a thing, but *every object* (whether it have as a thing a subjective dimension within its objectivity or not) necessarily exists (Deely 2014a) suprasubjectively as the terminus of a relation to finite mind. For the details of why this is so, see Deely, esp. 2009c, 2010 and 2011.

<sup>7</sup> Peirce c.1906: CP 5.473: “For the proper significate outcome of a sign, I propose the name, the interpretant of the sign. ... it need not be of a mental mode of being. ... it seems to me convenient to make the triadic production of the interpretant essential to a ‘sign’,” although in this regard (c.1902: CP 2.92) “It is not necessary that the Interpretant should actually exist. A being *in futuro* will suffice.”

This distinction between an “interpreter” and an “interpretant” (not, according to the common but historically benighted thesis commonly bandied about in the Peircean literature up to the present, the discovery that sign-relations must be irreducibly triadic, which had been demonstrated centuries earlier by Poincot), is the most original move in the semiotic of Charles Peirce. Note in particular that the “to or for whom” the sign presents another than itself may indeed be an *interpreter*; but Peirce’s point is that “interpreter” is a *species* of “interpretant”, not its full equivalent nor even necessary ‘alongside’ or ‘in addition to’ an interpretant.

*interpreter* in order for semiosis, i.e., the action of signs, to occur in the physical universe. But, furthermore, Peirce's idea of "being *in futuro*" as sufficient for the notion of Interpretant opens the way to semiotic understanding *even of the universe's physical evolution prior to the advent of life*: for when an Interpretant as a physical situation results *indirectly* from a *direct* dyadic interaction that *changes the relation* of the universe in the direction of being closer to being able to sustain life, that *new situation* must be regarded as a Thirdness in comparison with the presupposed Secondness.<sup>8</sup>

Accordingly, just as Peirce proposed "representamen" as a generic alternative to the specific term "sign" for naming the foreground element in a triadic relation standing for something other than itself as presented to or for some third, so also did he propose for the "third term" of the triadic sign relation formally constitutive of the sign materially considered as the foreground element (or "term") in a triadic relation standing for something *other than itself* as presented to or for some *third*, that we use **not** "interpreter", which is what a "potentia cognoscitiva" is by its very nature, but rather the "neutral", generic term *interpretant* which, then, emphatically, **need not always (even though it can sometimes well be) mental**, nor even — as we will see in our "Peircean epilogue" concluding this discussion — always be present actually "here and now" in the ongoing process.

That an interpretant need not be mental was, in effect, the point seized upon by Krampen in 1981 (commented in Deely 1982) with his publication under Sebeok's editorship of the proposal for recognizing the existence of a semiosis at work in the world of plants, a semiosis both prior to as well as entangled with the zoösemiosis of animal life. In plant life there is indeed an environment *sine qua non*, but there is no Umwelt wherein objectivity is cathected to constitute a world of objects interpreted as desirable, undesirable, or "ignorable" (safely ignored). There are stimuli in the physical order construed

<sup>8</sup> Reviewer 2 of this essay proposed that "the readers of *Biosemiotics* in particular" may want to know why even "a physical situation that results indirectly from a direct dyadic interaction that changes the relation of the universe in the direction *away* from the development of life" — the emergence of a high temperature anti-carbon forming atmosphere, for example — would not change it no less genuinely, consequentially and "lawfully" (and thus likewise constitute an example of Thirdness)? If both are equally cases of Thirdness, what claim is it exactly that is being made here?

The "default biosemiotic position today ... would be that (quoting Reviewer 2): 'All semiosis is triadic, but not all triadicity is semiotic'."

Let us try to clear up the confusion here. The universe as a whole today is the product of evolution, and while not every change in the order of Secondness directly supports life or the emergence of life, the dynamics of Secondness *overall* do result in conditions supportive of the emergence of life; otherwise, indeed, life would have never emerged. The "anthropic principle" admits of several formulations not always compatible; but that evolution overall tends toward biosemiosis (and anthroposemiosis within biosemiosis) is clear from the *present state* of the universe: "*ab esse ad posse valet illatio*", as the Scholastics noted (cf. Maritain 1967; Serani-Merlo 2009; but with the *caveat* in note 14 below!).

Thus, just as Thirdness within the realm of human awareness particularly always produces that species of representamen we call "signs", so Thirdness wherever it occurs in nature produces representamens that *will become signs* should they ever enter into the sphere of human awareness. *Triadicity* is not 'semiotic' but **semiosis**; while *semiotic* is the *knowledge* that develops from the *study* of semiosis — wherever the production of a relation irreducibly triadic is found to occur in nature. That triadicity may not of itself directly be a movement in the direction of life, but as interwoven with the universe become compatible with life overall it is an object of semiotic study, albeit ideoscopically rather than merely cenoscopically.

by the plant as “positive” or “negative”, but there is no “zero” meaning “safe to ignore”. This third category of objects, not truly zero (i.e., simply unrecognized) within zoösemiosis, is truly *zero*, i.e., *simply nonexistent*, for phytosemiosis. Nor are the + and – stimuli within phytosemiosis actual objects, but (just as in physiosemiosis) merely virtual,<sup>9</sup> objectifications; they are simply positive and negative assimilations to the plant of environmental factors affecting nourishment and flourishing.

This extension of semiosis to the world of plants was the step constitutive of, or (perhaps rather) *foundational to*, the establishment of **biosemiotics**, for this extension indeed made possible the thesis that semiosis is co-extensive with life: for life can neither flourish nor even survive apart from an action of signs whereby the living things manage their environmental relations in such a way that they are able to achieve the nourishment they need to grow and reproduce.

This dependency of life — plant, animal, human — upon semiosis is clear and constant. Nonetheless, life itself in the individual living thing is a form of substantial being that — while it provides through its individual characteristics (or “accidents”) the *foundations* without which there could be no relations (neither sign relations nor even the dyadic relations of “brute Secondness”, the relations consequent upon the physical interactions of individuals within a given environmental area) — is definitively *more than*,<sup>10</sup> however *dependent upon*, the action of signs. The living thing, dependent upon relations *secundum esse* (ontologically), is nonetheless itself rather a *relativum secundum dici* (a finite subjectivity), a possible object of forensic science, as we will see in the course of the following pages. The contrast between *secundum dici* and *secundum esse*, thus, is a contrast between the subjectivity or subjective dimension of finite being, and the relations that *can arise* among finite beings whether independently of or dependently upon finite awareness, depending upon the ever changing circumstances of existence here and now. All relations as *secundum esse* are suprasubjective, but only some of those relations are intersubjective as well. Relativity *secundum dici*, by contrast, refers not to suprasubjectivity directly, but directly to subjectivity as able to provenate (Deely 2010a: xiii–xiv) or give rise to relations both independently of and also within awareness, according to the circumstances prevailing in the universe of finite beings at any given time.

<sup>9</sup> On this distinction between virtual and actual semiosis, see particularly: Poinot 1632: TDS Book I, Question 1, 126/3–5; Deely 1989; Deely 2014 and see generally the articles on physiosemiosis — Deely 1990, 1993, 1995, 1997, 1998, 1999, 2001a.

<sup>10</sup> Kruse 1990: 222: “... within a Peircean framework, even if everything in the universe can be a sign, the universe is not composed exclusively of signs — or, more precisely, it is not composed only of things that are exclusively signs. In order for a sign relation to obtain, the representamen must first of all possess a relatively determinate, or grounded, potentiality to signify in some respect. The ground of this signifying capacity, and the dynamical object in relation to which signification is grounded, stand outside the representamen. They form the relations upon which signification is built, but insofar as they serve respectively as the ground and goal of sign interpretation, they are extrasemiotical.”

So what Poinsoot compels us to ask with his *esse/dici* distinction (1632: 117/20–24; cf. Deely 2004) is, quite simply, whether a sign as sign exists primarily as does relation in an irreducibly suprasubjective mode of being dependent upon subjectivity indirectly, or is a sign rather some subjective thing (“that stop sign ahead”) or characteristic of subjectivity (“that idea of camel that you have in your head”)?

And his answer is that a sign always requires entanglement with suprasubjectivity in order to be a sign, while the subjectivity thus entangled — what we *call* a sign in ordinary usage — is not the sign formally but rather the *sign-vehicle*, the subjectivity upon which the suprasubjectivity indirectly depends but does not reduce to for its existence.

Hence the action of signs through triadic suprasubjectivities is far from the whole of physical reality,<sup>11</sup> just as sign relations as irreducibly triadic are far from the whole of the relations obtaining in the physical universe. Indeed, in the physical universe, at the level of Secondness, relations as such are normally *dyadic*, in the sense the Latins identified as requisite to qualify for identification as a *relatio praedicamentalis* (Poinsoot 1632: 88/1–99/42), a relation verifiable under  $\tau\omicron\ \delta\upsilon\upsilon\varsigma$  as “realis” — independent of the awareness of any animal.

The secret of the action of signs lies precisely in the fact that, unlike the subjective characteristics of individuals that contribute to identify them within their species, relations are only *indirectly* dependent for their existence upon subjectivity. Without the subjectivity of substance as “being in itself” combined with the subjectivity of accidents as “being in another” there could be no intersubjectivity as “being toward another”. But *neither could “being toward another” be were it not for the suprasubjective character of relations as indifferent to the question of whether this suprasubjectivity is intersubjectively realized.* Yet, in the order of  $\tau\omicron\ \delta\upsilon\upsilon\varsigma$  as  $\varphi\upsilon\sigma\iota\varsigma$ , a relation not realized intersubjectively is not realized ontologically — *secundum esse*, according to its positive essence or being as over and above subjectivity — either. So the question of physiosemiosis, of an action or “influence” of signs in the order of  $\varphi\upsilon\sigma\iota\varsigma$ , comes down to the question of whether an intersubjective relation, normally

<sup>11</sup> Hence the crucial distinction between “physiosemiosis” as the idea that semiosis is *at work* in the material world of physical nature independently of life, and “pansemiosis” as the idea that there is *nothing but* semiosis throughout the universe, as if the universe consisted exclusively of signs. “Pansemiosis” is a misleading term which ought to be left to history’s dust-bin, as established in my exchange with Stjernfelt on this matter (Deely 2006). “Semiosis” is simply the *most generic term*, under which fall the sub-genera “anthroposemiosis”, “zoösemiosis”, “phytosemiosis”, and finally (as argued here) “physiosemiosis”, the first three marking the boundaries between the humans and the alloanimals (anthroposemiosis), the alloanimals as Umwelt occupants in contrast with plant life (zoösemiosis), and vegetative species in contrast with inorganic substances (phytosemiosis) among which occurs only physiosemiosis. Nor is that the “end of the line”: the biochemist, for example (as Reviewer #1 of my paper put it), might find it “a bit odd that zoö- and phyto- should be privileged forms of semiosis”, asking “what about fungal semiosis? Protist semiosis? Prokaryot semiosis?”, not to mention the “decisive distinction” between “eukaryot and prokaryot semiosis”. The questions are excellent, but carry us into the interface between cenoscopic and ideoscopic analyses of semiosis, and into the difficult laboratory analysis of what exactly the boundaries consist in, concretely and in experimental detail, within the vast varieties of individual entities that fall within these sub-genera mistakenly conceived as “privileged”. For it is not so much a matter of “privileged forms” as it is a matter of “provisional genera” established cenoscopically as points of departure for the unending further analyses of semiosis employing the laboratory methods and instruments of ideoscopy.

and typically dyadic in the physical order and resulting from “brute Secondness”, can achieve Thirdness — can realize triadicity — prior to (hence independent of) life.

The path to answering this question lies in a consideration of the nature of the influence proper to semiosis, the action of signs, particularly in overcoming Peirce’s mistake — widespread in the subsequent literature (see the discussion in Deely 2009a: 60 and *passim*) — to identify the causality of semiosis with a version of Aristotelian final causality. Once this mistake is remedied<sup>12</sup> in the

<sup>12</sup> The contrast between final causality and extrinsic specificative causality (which latter notion Peirce only approximates when he introduces “ideal causality” into his understanding of sign) is central to semiotics, but so far remains all but unknown to semioticians outside those few (growing, but still few) familiar with Poinset’s work. So I think it essential to the present context to clarify the contrast here (from Deely 1994a: esp. 160–163, 170–171; see also Deely 2009c: 233–275, Chapter 12, “The Full Vista of the Action of Signs”, esp. Section 4.3., pp. 261–269; also Deely 1991).

A *formal cause* embodied is the pattern or formal structure, the “architecture”, as it were, according to which something holds together and functions as a distinct entity. But a formal cause can also be *extrinsic* to an entity or grouping of entities, as would be an architectural plan. But there is a second type of extrinsic formal causality which does not *model* (“extrinsic formal exemplary causality”) but *specifies* an outcome, or what an outcome *would be* if certain conditions prevail; for which reason it has also been called “objective causality”. Extrinsic formal causality of this second type, i.e., specificative in contrast to exemplary, “is far removed from considerations of art or artifact, even though it pertains to such considerations insofar as they involve questions of knowledge. Objective causality occurs in nature itself wherever there are instances of relationship — that is to say, it occurs everywhere in nature. The dinosaur, long dead, is present in the fossil bone as its extrinsic specifier, enabling the scientist — paleontologist, in this case — definitely to classify a bone as belonging to a brontosaurus rather than a pterodactyl, etc.”

Such causality “occurs equally throughout culture, again wherever there is a question of relationships, which (again) is everywhere. The question of ‘style’ is a matter of extrinsic formal causality in the objective sense; deconstruction is an exercise in tracing patterns of extrinsic formal cause relative to a text; detective work is a matter of determining the extrinsic formal patterns which clues provide for the detective (and which patterns, by including this or that sensible element, constitute a clue — a sign-vehicle — in the first place).”

Thus “the type of causality which best explains the action of signs is not final causality, but extrinsic formal causality of the specificative or ‘objective’ type. The terminology here, as far as I know, does not appear as such in the Peircean lexicon, though it has an approximating counterpart in the Peircean notion of ‘ideal causality’, an expression which has a different history in Latin Age philosophy but, *as Peirce uses it*, pertains precisely to specificative causality.” Formal causality in the specificative sense best explains the action of signs from every point of view. This causality can be exercised through the intrinsic constitution of the sign-vehicle (in the case of a natural sign) or not (in the case of an arbitrary sign), as the situation calls for. It is more general than the final causality typical of vital powers, inasmuch as it specifies equally both vital activity and the chance interactions of brute secondness at the level of inorganic nature (in contrast with final causality, which in every sense never reduces to chance events and cannot take chance into account save indirectly — whereas chance is often *directly* involved in semiosis). This is the causality that enables the sign to achieve its distinctive function of making present what the sign-vehicle itself is not, regardless of whether the object signified enjoys a physical existence apart from the signification. Only extrinsic specificative formal causality is equally suited to the grounding of sign-behavior in chance occurrences (as when the implosion of a star leads to the discovery of a new law of physics, or when accidental scratches become the clue leading to the apprehension of the criminal) and planned happenings.

Once it is understood that the action proper to signs is explained by specificative causality, the central question for understanding the scope of semiosis becomes (as Peirce put it in 1904: CP 8.332): “What is the essential difference between a sign that is communicated to a mind, and one that is not so communicated?” On the one side of this line is the thirdness of experience, on the other side the thirdness of the laws of nature. How does semiosis link the two? The answer to this question is through the interpretant, which need not be anything mental, but must in every case provide the ground for objectivity virtual no less than actual (as referred to above).

Whence we see that life is more than semiosis but, conversely, that semiosis is more than life; and of the two semiosis is the more general process, and broader overall, underlying the evolutionary nature of the cosmos.

recognition that so-called “extrinsic formal causality”, not final causality directly, is required to explain the influence of signs, the way is open to seeing at last how a semiotic action is at work in the physical universe from the first moment of the “big bang”. For signs are distinguished above all by being able virtually to represent an “other” which need not actually exist. The reason for this is precisely the fact that semiosis is above all and distinctively an *influence of the future* (“vis a prospecto”: see Hoffmeyer 2008a) changing the relevance of past occurrences to present circumstances. The anthroposemiotic phenomenon of lying, for example, is but a high-level and comparatively negative illustration of the positive fact that signs typically (and uniquely) exercise an influence on present events which, through chance interventions no less than deliberate actions, may be *deflected* as actually occurring, but never simply *reduce* to an influence of past events on present circumstances, as envisaged in the “vis a tergo” views of Dennett, Dawkins, et al., portraying evolution as *wholly* determined by chance occurrences *wholly* within the order of Secondness.

Jesper Hoffmeyer famously (2007, 2008, 2010, 2012, 2014a, *inter alia*), in providing our subject matter for this present gathering of essays on his work, speaks of semiosis as erecting or building a *scaffolding* within the living world which provides the framework for biological evolution. Exactly in that way, I think, does semiosis in the physical universe effect a scaffolding preparatory for the *advent* of life, *with the difference* that physiosemiosis can be identified only momentarily, at the moment of establishment of the (physical) novelty which moves the universe from its initially lifeless-and-incapable-of-supporting-life state to a state still-lifeless-but-closer-to-being-able-to-support-life, and this time and again, making the universe draw closer and closer to being able to support life, till the final threshold is reached of being *actually capable of supporting life*, at which point the threshold is finally crossed and life itself becomes *actual* — at which moment also semiosis becomes *constant* rather than intermittent (actual rather than virtual, a flame rather than a flicker), as it was throughout the pre-life development of the universe from incapable to capable of supporting living things.

The Thirdness of the triadic relation is not so simple.<sup>13</sup> If it were, sign relations could be reduced to combinations of dyadic relations. Semiosis is easy to represent as a triangle, but this ease is a misleading one, for the construction of a triangle as such can precisely be reduced to the simple intersecting of dyadic relations. In the triadic relation, while the relation from sign vehicle to object signified is indeed direct, that relation (say, the relation between clouds and rain) only becomes a *sign* relation when it is subsumed within a *further* and *indirect* relation to an interpretant, which may but

<sup>13</sup> I cannot develop the point here, but the reader needs to become aware of the fact that a relation, in order to be “irreducibly triadic”, not only involves three terms (e.g., as Aquinas points out, “parenthood” is a single relation whether the parent has three children or nine or only one!), but involves the second terminus *directly* and on the *same level* as the first, while the third term is involved only *indirectly* and, as it were, on a *level above* both the first and the second termini. Hence the problem of diagramming the triadic relation of semiosis: it cannot be adequately represented in any two-dimensional diagram. This is a crucial point, perhaps the single most undeveloped central point for the understanding of semiotics at the present time. My own beginning of this new discussion — the two-dimensional unrepresentability of any relation irreducibly triadic (the relations that constitutes the “being” upon which semiosis as an “action” follows) can be read in Deely 2009: li–xc, “Words, Thoughts, Things: Aristotle’s Triangle and the Triadic Sign”.



*need not* be mental, as Peirce put it — and indeed, in the universe prior to life (as also in phytosemiosis wherever it occurs apart from entanglement with zoösemiosis), *cannot* be mental.

To find out what has happened, we need both indexical and iconic signs. But to find out what *could* happen, indexical signs are too closely tied to physical interactions precisely as Secondness to give the complete story. Thus Peirce (1903: CP 5.73) contrasts iconic sign vehicles to indexical sign vehicles in just this way: an icon fulfills its function “by virtue of a character which it possesses in itself, and would possess just the same though its object did not exist” — in our case, though its object does not *yet* exist; an index by contrast fulfills its function only “by virtue of a character which it could not have if its object did not exist, but which it will continue to have just the same whether it be interpreted as an index or not”.

I emphasize the case where the iconic object does not *yet* exist, for in physiosemiosis prior to life, what the semiosis does is anticipate (by providing the conditions for) a future outcome of physical interactions within the universe where suddenly the wholly lifeless universe is moved a step higher in the direction of being able to support life — in the words of my Lund colleague: “something more from nothing but” where the interactions within physical reality suddenly result in a condition which makes the universe originally incapable of supporting life *less incapable* than it was formerly, than it was originally. It is a momentary semiosis, not itself ongoing, like a struck match that in a moment goes out: but the universe in its physical condition of being is left changed from what it was, moved in the direction, the “upward” direction, of being able to support life after all, even though not yet actually supportive of it, since actual living things have not yet fully become possible.

This is a tissue of relations, imperceptible as such (for relations have no quantitative dimension whereby sense might directly apprehend them), dependent indeed upon the subjectivities interacting, and yet more than the simple offspring of physical interactions: they are the offspring of physical interactions only as resulting in erection of a scaffolding moving the lifeless universe in the direction of being able to support life.<sup>14</sup> It is like a match struck which almost immediately goes out; yet the brief flame of this virtual semiosis does not simply “go out” and leave nothing; what it leaves behind is a furtherance of the physical scaffolding which, slow by slow, will result in the *actual possibility* and then the *actuality itself* of a universe with living beings present, beings which earlier — at a lower stage in the development of the physiosemiotic scaffolding — were not possible *at all*. Now, in the living world, semiosis becomes a flame that burns constantly in the maintenance of

<sup>14</sup> Here I can only, as it were, beg the question; for while I wrote in 1969 an essay which definitively proved on cenoscopic grounds the existence of life (and indeed of intellectual life) elsewhere in our universe — insofar as such a thing can be “proved” in the absence of experimental evidence! — the fact that my 1969 “proof” has still to be verified by ideoscopic science leaves it somewhat shrouded in a cloud of humor. Nonetheless I remain confident that our discovery of life elsewhere than on earth remains only “a matter of time”, provided the dimensions of our ideoscopic sciences expand sufficiently to overcome the otherwise inevitable extinction of our terrestrial species along the lines Peirce discussed (c.1885: CP 8.43), as we will see below.

life; but without its intermittent prior sputterings, life would never have become possible in the first place.

The transition from “nothing but” to “something more” is precisely that “influence of the future” which distinguishes the action of signs as the only action where what does not exist plays a positive role in shaping (or reshaping) what does exist. Intermittent, like chance, which semiosis involves; but directional, resultant in “something more”, which chance of itself need not be. Chance and semiosis are both entangled with the teleonomy<sup>15</sup> of physical substances interacting; but semiosis as physiosemiosis is *directive* of those interactions not randomly (not in the manner of pure chance) but decisively in an upward direction — the direction of life’s increasing possibility and final actuality. Just as zoösemiosis does not displace phytosemiosis yet goes beyond it, so too phytosemiosis goes beyond physiosemiosis without displacing it, and indeed while depending throughout upon the continuance of physiosemiotic results as having shaped the physical surroundings toward the possibility of life.

Thus, just as a virtual semiosis prior to cognitive acts underlies the forensicist’s ability to establish in present being past interactions of a substance, just so virtual semiosis is also at work in the ways that present interactions anticipate future conditions radically different from what presently obtains. Present effects are virtual signs not just retrospectively, but prospectively as well. They portend, and this in two ways. First of all, in any given interaction of bodies, over and above the resultant relations of cause and effect (acting and being acted upon), there is the fact that each of the bodies involved interprets and twists the action according to its own intrinsic nature (final causality). In this way, as Powell put it (1986: 300), “the extrinsic specification of causal relations always reveals indirectly the intrinsic species of the bodies which are their extrinsic specifying causes”. Thus dyadic interactions, as extrinsically specified by the bodies involved at the level of secondness, *also project a virtual level of thirdness that anticipates* changes in future states respecting the interactions occurring here and now. And the measure of these interactions as anticipative of future developments not reducible merely to consequences of Secondness as such occurs through precisely the same type of causality operative in the sign, whereby it achieves indifference to the being and non-being, presently considered, of what is signified.<sup>16</sup>

The virtuality of semiosis in the direction of future states is more complex than in the simple preservation of evidence of past interactions, for the reason that the direct deflection of the results of the interactions (combining chance *and* the finality of action as consequent upon the substantial identities and diversities of the interactants) itself can lead to changes in the immediate constitution of what does the interacting — as, for example, when one of the interactants is destroyed by the interaction, or when the interaction triggers a new phase in the development of one of the interactants, or when a specifically

<sup>15</sup> On the terms “teleonomy” vis-à-vis “teleology”, see Deely 2001: 65–66.

<sup>16</sup> On the extension of extrinsic formal causality, the objective causality of semiosis, from specification of vital powers to categorial or physical relations as such, see Poinso 1632: TDS Appendix C, “On the source of specific and individual identity of relations”, 382/4–26. See further, in Index 4 to the *Treatise* (the Index Rerum/Index of Terms and Propositions), the entries under “Object”, pp. 552–554, beginning with no. 4, referring the whole text to extrinsic formal causality. Also see the entries for “Foundation”, p. 539.

new type of being (such as a new atomic elementary formation) results from the interaction. Here, Peirce's idea of scientific laws existing as habits in nature as a whole would seem to find, as it were, a semiotic grounding once the error of identifying semiotic causality with so-called final causality has been overcome.<sup>17</sup> For, over and above the individual interactions of bodies, there is a macroformation of the universe that takes place directionally, as it were, toward the establishment of conditions under which the virtual semioses entangled in physical interactions move always closer to actuality as the universe itself moves closer to the birthing of life.

Out of cosmic dust, stellar systems form through subatomic, atomic, and molecular interactions. At various stages of the process, new elements not previously given precipitate from the interactions (even as now on earth we can in laboratories bring into being a few elements not yet existent in nature itself). These elements, in turn, prove essential to the formation in planetary systems of the conditions under which living beings become possible, and these beings, in turn, further modify the planetary conditions so that successive generations of living beings are incompatible with the original conditions of life.<sup>18</sup>

Through this entire series of intersecting and often conflicting processes resulting in cosmic evolution over-all, the specificity and identity of any given process at each step is guaranteed not by individual bodies but by systems of commonly specified real relations between bodies, that is, by specifically identifiable categorially determined systems of ontological relations. Within these systems individual bodies *further* determine their immediate interactions (only here does the teleonomy of so-called "final causality" enter in) according to their own intrinsic natures. In the case of organisms, where semiosis is no longer merely virtually but rather fully active, this determination in turn depends on a whole sub-system of interactions indisputably semiotic in nature, as Sebeok has pointed out (1977, 1988; 1989a). Yet it is the relational systems as a whole and the interactions within them that form *throughout* the cosmos a single web of semiosis virtual at the minimum, governed at each point by the objective causality of the sign virtually at work throughout the whole panoply of causal interactions at the level of Secondness. This causality corresponds to the "plan" in von Uexküll's distinction (1934: 42–46) between goal and plan in nature and is, as Powell points out, "prior to the well-known Aristotelian four causes, the agent, the final, the formal, and the material cause" (Powell 1988: 180, 186):

It is precisely the function of extrinsic formal causality to displace the agent and final causes by a more elementary cause which is not committed to explaining how interaction could be understood. Thus the solar

<sup>17</sup> This erroneous identification of semiotic causality with final causality has been the single greatest obstacle to the understanding of physiosemiosis. As I remarked in the 5th ed. of *Basics* (Deely 2009d: 269), the sign may be and normally is entangled with final causality at the level of substance, but that is not at all because *the sign* has a final causality, but rather because the sign has an *extrinsic formal specificative causality* that is in principle objective *virtually* over and above the subjective being of the sign-vehicle *of* that specification.

<sup>18</sup> For example, oxygen, essential for life on this planet now, was originally introduced as a waste product of living beings who neither needed nor could survive within a heavily oxygenated atmosphere.

system is explained as a mechanism specified by extrinsic formal causes without needing any explanation by agent causes (let alone by final causes ...). For Einstein's general theory of relativity precisely eliminated gravitational forces from explanation of the solar system, by substituting the curvature of space-time for gravitational forces (Hawking 1988: 29–30). Now gravitational forces [as conceived in the framework of Newtonian physics were] agent causes, whereas the curved space-time that governs the path of the earth around the sun is an excellent example of extrinsic formal causality ... because that path consists of specified temporal relations between the earth and the other bodies of the solar system ... plain cases of extrinsic formal causality.

Thus, Peirce's discouragement (cf. c.1909: 6.332) at establishing his broadest conception of semiosis proves unnecessary,<sup>19</sup> once it is understood that the specification of categorial relations in the universe at large already puts into play the causality upon which the action of signs depends: already at the level of their fundamentals, signs are virtually present and operative in the dyadic interactions of brute force, weaving together in a single fabric of virtual relations the future and the past of such interactions.

This is semiosis of the specific kind that I have called *physiosemissis*, so as to bring out by the very name the fact that it is a question here of a process as broad as the physical universe itself. For this process is at work in all parts of the universe as the foundation of those higher, more distinctive levels of the same process (rooted in the singularity of relation) that come into existence as the conditions of physical being themselves make possible the successively higher levels first of life, and then of cognitive life. Thus, the definition of semiosis is *not just* coextensive with the definition of life — though it is that, it is also *broader still*.

And the transformation of physiosemissis within specifically living interactions, even prior to any question of cognition as such, is dramatic, requiring a specifically identifying label. For physiosemissis not only links in the present the intelligibility of past and future, it does so by looking to the future beyond interacting individuals only accidentally.<sup>20</sup> By contrast, the semiosis virtual to *living matter* is *essentially* oriented at

<sup>19</sup> Likewise unnecessary was his desperate earlier resort to panpsychism as a ploy for introducing thirdness into the realm of inorganic matter (Peirce 1892: 6.158, 1892a: 6.268), which yet failed to solve the problem of *experienced* thirdness (c.1909: 6.322) as required by the sign for its proper and formal being fully actualized. Thus, while “anthroposemissis” and “zoösemiosis” designate a sphere within which semiosis directly involves awareness as well as life, and “phytosemissis” a sphere which involves life but not necessarily awareness, “physiosemissis” designates the dimension of semiosis which both preceded and currently surrounds as made possible the biosemiotic sphere without itself *directly* requiring neither life nor awareness.

<sup>20</sup> I say that physiosemissis looks to the future only in a comparatively accidental or tangential way, inasmuch as, in the case of inorganic agents, which cause only as they are moved, “from the very movement that they undergo they are ordered to producing effects. And similarly in all cases where a good of any kind accrues to the cause from the effect” (Aquinas c.1265-1266: q. 7. art. 10), such as Powell's example (1986: 297) of the senselessness of saying that “the causal relation whereby one cat scratches out the eye of the other is specified by a final cause”. For even though “one and the same motion is a ‘good blow’ for the one scratching out and a ‘disaster’ for the one losing its eye”, the good (and the “disaster”) pertains directly to the individual circumstances of the cats, not to their specific natures as belonging to a determinate biological population.

once to the preservation as well as to the propagation of the units interacting, and is thereby *essentially* future-oriented.<sup>21</sup>

Thus orientation to the future, with differing intensity, is nonetheless operative in semiosis from the first. The distinction between physiosemissis as *depending mainly* (though not exclusively) on chance events for achieving its future orientation, and the semiosis of living matter (biosemiosis) which *essentially* turns chance events toward the future in the teleonomic behavior of organisms absorptive of chance, draws very well the boundary line between physiosemissis and phytosemiosis, the “semiotics of plant life”, as Krampen calls it, or biosemiosis as the semiosis of living matter in general.

No stars in the early universe. No planets without stars. No life without planets. So we see in at least rough, crude outline the scaffolding whereby the universe is moved upward from its primitive lifeless origins neither supportive of nor even capable of supporting life, to planets teeming with life. The scaffolding is brought about through physical interactions within the universe, yes; but as *scaffolding* it requires more than mere Secondness, more than brute force interactions, though it does need these. If *something more* did not result from *nothing but*, there would be no scaffolding, only endless chance occurrences going nowhere.

Wherever and to whatever extent “something more” results within the conflux of physical interactions and chance events, there we find the virtuality of Thirdness, of a semiosis at work to make life more and more possible. It is semiosis — semiosis from physiosemissis through phytosemiosis and zoösemiosis through anthroposemissis — that gives substance to the famous but to now rather ambiguous “anthropic principle”, especially in its stronger formulations; and it is semiosis that provides even a better name for, because it profoundly deepens our understanding of, what has heretofore been termed “evolution”. To the *vis a tergo* touted by the Dennett and Dawkins crowd, semiosis adds as well a *vis a prospecto* (an *influence of the future*), and precisely in that — an influence of the future changing the relevance of past to present — does the action of signs manifest itself most distinctly, arcing the whole course of the universe from an initial lifelessness to ourselves, changing profoundly our whole understanding of evolution, and perhaps even providing that process with its more proper name.

<sup>21</sup> Furthermore, in the case of anthroposemissis, the preservation and generation of culture is future-oriented *beyond* mere biological propagation, a point that completes the grand view of a progression through past-future relations from physiosemissis to anthroposemissis. This is a progression, however, in which the successive levels of transcendence do not fully leave behind, but rather contain and continue the previous levels according to varying requirements.

Regarding what is now discussed as “the anthropic principle” (the developmental inclination of the universe from physiosemissis to anthroposemissis), Peirce (c.1885: CP 8.43) had a rather definite opinion: “We may take it as certain that the human race will ultimately be extirpated; because there is a certain chance of it every year, and in an indefinitely long time the chance of survival compounds itself nearer and nearer zero. But, on the other hand, we may take it as certain that other intellectual races exist on other planets — if not of our solar system, then of others; and also that innumerable new intellectual races have yet to be developed; so that on the whole, it may be regarded as most certain that intellectual life in the universe will never finally cease.”

### Thirdness in Nature: a Peircean Epilogue to Hoffmeyer's Scaffold Notion

"I, a person of the strongest possible physiocistic prejudices," Peirce tells us (c.1909: CP 6.322), "as the result of 40 years of questioning," — "since the beginning of the year 1867", to be more precise<sup>22</sup> — "have been brought to the deep conviction that there is some essentially and irreducibly other element in the universe than pure dynamism", something more than the mere Secondness exhibited in "brute force".

That was "on the one hand". On the other hand, Peirce was convinced that this "essentially and irreducibly other" element in the universe could only consist in "a genuine triadic relation"<sup>23</sup> which, since it had to be an element that *preceded* both human life and every other biological form, could neither be "an intellectual relation" nor "a relation concerned with ... phenomena of life" (i.e., life in the biological sense: Peirce c.1909: CP 6.322). Thus Peirce held the opinion that "the problem of how genuine triadic relationships first arose in the world is a better, because more definite, formulation of the problem of how life first came about."

I suggest that key to solving this problem is Peirce's proposition (c.1904: EP 2.322) that "nothing can be more futile than to attempt to form a conception of the universe which shall overlook the power of representations to cause real facts". "The life of symbols" in Peirce's sense,<sup>24</sup> rather than "the life of organisms" in the biological sense, provides us means to realize that semiosis involves an influence of the future ("*vis a prospecto*", changing relevance of past circumstances to present situations) at work not only in the lifeworld but in the universe as a whole — including the physical dimension of the universe as "environment" both preceding and surrounding biological life.

Now Peirce was among the early figures to see unmistakably that the universe of human experience not only occurs within a much larger physical universe which is, as physical, indifferent to species-specific variations in the life-world of plants and animals (the sun emits its heat and light indifferent to the existence of bats or earthworms, corn or sunflowers, or anything else on or below earth's surface), but to see also that this "larger physical universe" is an *evolutionary* universe which did not contain life at its beginning.

Irreducibly triadic relations are easy to verify in the living world, and more easily the higher we ascend the evolutionary ladder of life. They are, as Peirce recognized, the very essence of semiosis, i.e., of the action of signs upon which living beings have been proven to depend for "nourishment and flourishment".

But a semiosis in nature prior to and independent of life, a "physiosemosis"? How could that be?

<sup>22</sup> The manuscript from which the quote is taken the scholars date "c.1909"; depending on how literal the "forty years" here is to be taken, it might be as early as 1907.

<sup>23</sup> Peirce distinguishes "genuine" triadic relations (those in symbols) from triadic relations "degenerate" in either the first degree (those in indices) or second degree (those in icons). However, this distinction he derives from mathematics, and I have some question as to the fulness of its applicability to the problem at hand, inasmuch as to understand semiosis as at work in the physical universe prior to life we have to suppose that "degenerate" precedes "genuine" thirdness, which is a bit odd, since "degeneracy" in the physical sense would more easily be conceived as *following* or *consequent upon* an authentic state. However, this is not a question I aim to discuss here, save to remark that, in physiosemosis, we should perhaps speak rather of *pregeneracy* ("pregenerate Thirdness") than of *degeneracy*.

<sup>24</sup> Peirce c.1904: EP 2. 324: "there can be no reality which has not the life of a symbol". Cf. Houser 2013: "The Intelligible Universe".

The better question, perhaps, is: Once we have discovered the evolutionary nature of the universe *as a whole*, how could such a semiosis *not* be?

Consider. “Brute Secondness”, physical interaction, requires actual existence here and now of the interactants. Not so action of signs. Semiosis is the only form of action which does not presuppose the actual here-and-now existence of the “individuals” involved in the interaction. Peirce was of the opinion that it is “untenable doctrine” to say “that the future does not influence the present”.<sup>25</sup>

Well, if this is so, then an “influence of the future” upon the present — a “*vis a prospecto*”, as Hoffmeyer called it (2008a: 939; cf. Broden 2008: xxiv; Deely 2009: lxxiii & lxxxi) — re-organizing relevance of past events to what is occurring now, may be said to be the most distinctive feature of the action of signs! In order to know “what has been”, we depend upon the action of signs. In order to know “what is going on now”, we depend upon the action of signs. In order to know “what will be”, we depend upon the action of signs. Indeed, precisely because the action of signs, unlike all other actions, does not depend upon the actual existence here and now of the participants in the action, our knowledge both of what has been and what will be (and even of what is now) turns out all too often to be wrong.

In Peirce’s notion of synechism, “reality” consists not only of what is but as well of what could be and what will be. The action of signs, in principle, is a process that goes on “ad infinitum”.<sup>26</sup> But in fact “brute secondness” and chance events often interrupt, so that the semiosis series is “broken off”. In such a case, Peirce notes (continuing c.1902: CP 2.92), the sign “falls short of the perfect significant character”, but that is not the same as to say it falls short of *reality*, for “it is not necessary that the Interpretant should actually exist. A being *in futuro* will suffice.”

So search for “genuine Thirdness”<sup>27</sup> in nature prior to advent of life seems to me to require that we be guided by this notion of “being *in futuro*” as *momentarily* realized each time the physical interactions of finite beings (“brute Secondness”) result in an *indirect consequence* which moves the universe in some part closer to ability to sustain biological life. “Genuine Thirdness” in Peirce’s mathematical sense requires simultaneous existence of the three terms of the triadic relation, such that the Third has the same relation to the Second as does the First. However, when an Interpretant as a physical situation results indirectly from a direct dyadic interaction that *changes the relation* of the universe in the direction of being closer to being able to sustain life, that *new situation* must be regarded as a Thirdness in comparison with the brute Secondness from which it resulted.

There is no “Thirdness” in Hume’s example of billiard balls interacting: the situation starts with contact between billiard balls moving, and ends with billiard balls moving affected only as to their direction of movement. That is a classic illustration of “pure Secondness”. But that is not at all what we have occurring in the evolutionary trajectory

<sup>25</sup> Peirce c.1902, from Chapter 1 of the uncompleted *Minute Logic*: CP 2.86.

<sup>26</sup> Peirce c.1902: CP 2.92: “Genuine mediation is the character of a Sign. A Sign is anything which is related to a Second thing, its Object, in respect to a Quality, in such a way as to bring a Third thing, its Interpretant, into relation to the same Object, and that in such a way as to bring a Fourth into relation to that Object in the same form, ad infinitum.”

<sup>27</sup> Again, keep in mind that, as above discussed, my use of “genuine” in this context cannot simply be reduced to the mathematical sense of Peirce’s contrast between “genuine” and “degenerate”.

the universe has taken from its biologically lifeless beginning to regions where biological life has become actual.

Of course, many physical interactions result in “nothing really new” (as in Hume’s billiard ball analogy); others result in a (physically) degenerate “new condition or state” (of a “Thirdness” “degenerate” in a physical rather than mathematical sense) detrimental to life, as in the hypothesis (see “Asteroid Impact” 2011) that collision between earth and a comet or asteroid wrought extinction of the dinosaurs.

But the Thirdness I am speaking of occurs when dyadic interactions bring about existence of a *new condition or state* which (by definition) does not *reduce* to dyadic interaction(s), yet *results nonetheless* precisely *from* dyadic interaction: for were there no such occurrence as this, then no evolution of the universe would be possible in the first place, let alone the evolution which led a lifeless universe to a universe both capable of and actually supporting life in local environments — localities which had no actual existence at the very beginning yet came about gradually as indirect accumulation of *sic et non* novelties not directly predictable from the physical interactions of “brute Secondness” which, indeed, only *sometimes* (and far from always) bring about such indirect consequences changing the physical environment in relation to a “living future”.

Thus, while the universe does not consist exclusively of signs, it is yet perfused by Thirdness as the action of signs, beginning as a “physiosemosis”, and only culminating much later (as far as we are concerned!) as “anthroposemosis”.

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