HISTORY OF SEMIOTICS

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Semiotic awareness was initiated by Augustine (c.397AD) and Poinsot, then followed by John Locke, in 1690, and Charles Sanders Peirce, who discovered the categories of semiotics, realism and idealism (1867-1914).

INTRODUCTION

Literature is a medium which provide knowledge and information from the writer. Language is the source of literature and also the medium to communicate with others. Communication in daily activity especially in Indonesian tradition which include many expression and idioms in order to strengthen the tradition itself such as 'maulid nabi' which contains prayers to our prophet (Rahman, 2017). Based on Rahman's research, there is a relation between language and literature. Rahman (2020) stated that literature is an identity which referred to ethno-literature. Ethno-literature is an oral form which maintained by the speaker through generations. Literature is a source of learning and entertainment for readers (Rahman, Amir P., & Tammasse, 2019). One of literary work that has interesting aspects and has important role in literary research is Shakespeare's writing as Rahman & Weda (2019) in their research regarding linguistics deviation and rhetoric figures in Shakespeare's selected plays.

1. The Ancient World and Augustine

Augustine was the first to argue that the signum is a tool or means commonly used to carry out various types and levels of communication. This view was considered surprising in his day because in the philosophical world of Greece or ancient Rome, which was dominated by this philosophy, no single view of the sign was the same as we believe today. The root word "seme" is of course Greek, but in the Greek text itself the view of the sign is divided into two, namely between Semeion / Nature on the one hand and Symbol / Culture. Plato di Cratylus (c.385BC), as well as Aristotle in all of his works including Perihermenias [c.330BC: 16-20a; cf. Eco et al. 1986: 66-68], and Boethius [esp. inter 511-513AD] confirms the tendency of Augustine's opinion about the unity of signs (doktrina signorum).

Apart from Augustine, there were also the Stoics, who in their debates with the Epicureans developed a fairly complete theory of signs but that only a fraction of their opponents had, especially Sextus Empiricus (c. 200). Eco, Lambertini, Marmo, and Tabarroni (1986: 65-66) said that Augustine was the first to put forward the term general semiotics, namely the science or general doctrine of signs.

2. The Latin World

In the development of semiotic awareness, William of Ockham (i.1317-1328), although rejecting logicians, accepted Augustine's definition that each sign is a link or vehicle to something immaterial, that is, the content identified by the sign which cannot be felt. . William's objection to logicians stems from taking external signs such as words and signs and the inner way of knowing such as images and ideas as part of the perspective of the sign.

The long-established rejection of the relationship between sign and perceived meaning occurred while Ockham was living in Paris and because of his introduction to the concept of signum naturale. Petrus d'Ailly (c. 1372) distinguished the internal way (signa formalia) and the external way of knowing (signa instrumentalia), whereas what is known and what is felt are shared by society. Williams (1985a: xxxiii) argues that the controversy in semiotics that began around the 17th century revolved around the question of whether signs only involve what can be felt. But according to William, it is more important to put thoughts and words into the perspective of the doctrine of the sign.

3. The Iberian Connection

Dominicus Soto (1529, 1554) at the start of his studies in Paris disagreed with the relationship between the presence of a sign and its active function in experience with vehicles that can be perceived as a sign, raising questions about the dependence of objectivity when the sign functions. The function of a sign is limited to what can be seen and experienced directly as an object. (Williams, 1985).

In general, from ancient times to the present, the sign is seen as a Janus mask (Janus mask), has two faces, and is relative to the cognitive powers of some organisms on the one hand and with the contents of the sign. on the other hand. Relativity is what causes a sign to become a sign. In this connection, signs can function from within the cognitive powers of an organism and signs that function to influence those forces from without. That difference questions the nature of relativity? John Poinsot answered that question in his book Treatise on Signs (1632a). The pre-semiotic or idealist realist paradigm fails to understand that ideas are signs before they become objects of our consciousness. In their view, a sign can only give access to the essence of something only to what it can convey. itself is unnatural in terms of the previous tradition and in what it anticipates.

The decisive development in this regard was the privileged achievement of John Poinsot, a student with the Conimbricenses, and the successor, after a century, to Soto's own teaching position at the University of Alcalá de Henares. With a single stroke of genius resolving the controversies, since Boethius, over the interpretation of relative being in the categorial scheme of Aristotle, Poinsot (1632a 117/28-118/18, esp. 118/14-18, annotated in Deely 1985: 472-479) was

able to provide semiotics with a unified object conveying the action of signs both in nature virtually and in experience actually, as at work at all three of the analytically distinguishable levels of conscious life (sensation, perception, intellection). By this same stroke he was also able to reconcile in the univocity of the object signified the profound difference between what is and what is not either present in experience here and now or present in physical nature at all (Poinsot 1632a: Book III).

Poinsot was able to reduce to systematic unity Soto's *ad hoc* series of distinctions, as he put it in his first announcement of the work of his *Treatise* ("Lectori", 1631; p. 5 of the Deely 1985 edition), and thereby to complete the gestation in Latin philosophy of the first foundational treatise establishing the fundamental character of, and the ultimate simplicity of the standpoint determining, the issues that govern the unity and scope of the doctrine of signs. Unfortunately, because he so skillfully embedded his *Tractatus de Signis* within a massive and traditional Aristotelian *cursus philosophiae naturalis*, he unwittingly ensured its slippage into oblivion in the wake of Descartes' modern revolution. Three hundred and six years would pass between the original publication of Poinsot's *Treatise on Signs* and the first frail appearance of some of its leading ideas in late modern culture (Maritain 1937-1938, discussed in Deely 1986d).

4. The Place of John Locke

Coincidentally, Poinsot achieved his Herculean labor of the centuries in the birth year of the man whose privilege it would be, while knowing nothing of Poinsot's work, to give the perspective so achieved what was to become its proper name. Thus, 1632 was both the year John Locke was born and the year that Poinsot's treatise on signs was published. The name-to-be for what both Locke and Poinsot and, later Peirce also, called "the doctrine of signs"—an expression of pregnant import in its own right, as Sebeok (1976a: ix) was first to notice (elaborated in Deely 1978a, 1982b, 1986b *inter alia*)—was proposed publicly fifty-eight years later, in 1690, in the five closing paragraphs (little more than the very last page) of Locke's *Essay concerning Humane Understanding*.

The principal instigation that Locke himself wrote in reaction against, but along very different lines from what he would end by proposing for "semiotic", was the Cartesian attempt (1637, 1641) to claim for rational thought a complete separation from any dependency on sensory experience.

The irony of the situation in this regard was that Locke's principal objections to Descartes were not at all furthered by the speculative course he set at the beginning and pursued through the body of his monumental *Essay concerning Humane Understanding* of 1690. Instead, he furthered the Cartesian revolution in spite of himself; deflected the brilliant suspicions of Berkeley (1732); fathered the cynical skepticism of Hume (1748);[47] and laid the seeds of overthrow of his own work in concluding it with the suggestion that what is really needed is a complete reconsideration of "Ideas and Words, as the great Instruments of Knowledge" in

the perspective that a doctrine of signs would make possible. The consideration of the means of knowing and communicating within the perspective of signifying, he presciently suggested, "would afford us another sort of Logick and Critick, than what we have hitherto been acquainted with". It was for this possible development that he proposed the name semiotic.

The antinomy between the actual point of view adopted at the beginning for the Essay as a whole and the possible point of view proposed at its conclusion (Deely 1986a) is, for semiotic historiography, an object worthy of consideration in its own right.

It remains that to Locke goes the privilege and power of the naming. If today we call the doctrine of signs "semiotic" and not "semiology", it is to the brief concluding chapter XX in the original edition of Locke's Essay that we must look for the reason—there, and to the influence this chapter exercised on the young American thinker, Charles Sanders Peirce, who read the Essay but made of its conclusion a substantial part of his philosophy and lifework from 1867 onward.

5. Ferdinand de Saussure, Charles S. Peirce, and John Poinsot

Contemporaneously with Peirce, and independently both of him and of Locke, Ferdinand de Saussure was also suggesting that the doctrine of signs was a development whose time had come. For this development he proposed a name (i.1911-1916: 33):

We shall call it semîology (from the Greek semeion, 'sign'). It would teach us what signs consist of and what laws govern them. While recognizing that, inasmuch as "it does not yet exist, one cannot say what form it will take", Saussure wished to insist that the prospective science in question is one that "has a right to existence" and a place "marked out in advance". It will study "the life of signs at the heart of social life" and be "a branch of social psychology". "The laws that semiology will discover" are, accordingly, the laws governing "the totality of human phenomena", or culture in its contrast with nature. We see then that Saussure's intuition was fatally flawed in its original formulation. He placed on his intuition of the need for a science of signs the fatal qualification of viewing it as a subordinate (or "subaltern") rather than as an architectonic discipline respecting the whole of human belief, knowledge, and experience, as we have seen its internal requirements dictate. He further compromised his proposal for the enterprise by making of linguistics "le patron gnéérale de toute sémiologie", raising the "arbitrariness of signs" into a principle of analysis for all expressive systems. Thereby he obscured the much more fundamental interplay of the subjectivity of the physical environment and the subjectivity of the cognizing organism in the constitution of objectivity for *Umwelten* in general and the human *Lebenswelt* in particular, whereby, in the latter case, even the linguistic sign in its public functioning becomes assimilated from the start to a natural form, as far as its users are concerned.

The duality of *signifiant* and *signifié*, in a word, lacked the thirdness whereby the sign in its foundation (and whether or not this foundation be essentially arbitrary or "stipulated") undergoes transformation into first an object and then into other signs. The dynamics of the process linking semiosis in culture with semiosis in nature, and making one the extension of the other in an ongoing spiral of interactions, needs to be brought in. But, for that, the framework needs to be radically reformulated. As far as the contemporary establishment of semiotics goes, it was the privilege of Charles Sanders Peirce to provide just such an alternative framework under the influence of Locke's suggestion.

Let us look with some care at what Peirce did with Locke's suggestion, and see if we can see with something of dispassion "Why", as Short put it (1988), "we prefer Peirce to Saussure" today. We will see at the same time something of the doctrinal convergence Peirce, working with contemporary and modern materials, achieves with the foundational synthesis of a doctrine of signs distillated by Poinsot from the materials of Greek antiquity and the Latin middle age.

Beginning with his "New List of Categories" in 1867, and continuing until his death in 1914, semiotic in this broadest sense of the study of semiosis surrounding, as well as within, the human world provided the thrust underlying and the unity for a substantial part, and perhaps even for the whole, of Peirce's philosophy.[48]

At the same time, even in the "New List of Categories" as originally drafted, it is fair to say that Peirce labored overly under the influence of Kant as Master of the Moderns—that is to say, between the horns of the dilemma set by the (false) dichotomy of the realism versus idealism controversy. Since, as I think, semiotic in principle and by right—the *jus signi*, let us say—begins by transcending the terms of this controversy, it is not surprising that Peirce had such a time of it whenever he succumbed to the temptation to try to classify his own work in realist-idealist terms. Assuming naturally the terms of the controversy as it had developed over the course of modern thought, he only gradually came to critical terms with the fact that semiotic as such is a form neither of realism nor of idealism, but beyond both.

As a disciple of Kant in early life, Peirce labored at the impossible task of establishing the complete autonomy of the ideal/mental from what is individually existent in nature. In later life he concluded that this erroneous quest had vitiated modern philosophy (1903: 1.19-21). Significant of this evolution of his thought is the fact that in Peirce's later philosophy his supreme category of Thirdness changed from representation in 1867 to triadic relation as common to both representations and to laws existent in nature (c.1899: 1.565).

By his Lowell Lectures of 1903, and even already in his c. 1890 "Guess at the Riddle", it is clear that Peirce was well on the way to taking his categories of semiosis properly in hand and was marking out a course of future development for

philosophy (as semiotic) that is nothing less than a new age, as different in its characteristics as is the "realism" of Greek and Latin times from the idealism of modern times in the national languages.

In his "Minute Logic" (c.1902a: 1.203-272) we have a lengthy analysis of what he calls "ideal" or "final" causality. He assimilates these two terms as descriptions of the same general type of causality (ibid.: 1.211, 227). But, in successive analyses (ibid.: 1.211, 214, 227, 231; and similarly in 1903: 1.26), it emerges that causality by ideas constitutes the more general form of this sort of explanation, inasmuch as final causality, being concerned with mind, purpose, or quasi-purpose, is restricted to psychology and biology (c.1902a: 1.269), whereas ideal causality in its general type requires as such neither purpose (1.211) nor mind nor soul (1.216: cf. the analysis of Poinsot 1632a: 177/8-178/7).

Now Peirce identifies this ideal causality with his category of Thirdness, the central element of his semiotic (1903: 1.26) and the locus for any account of narrative, or of "lawfulness of any kind". Thirdness consists of triadic relations (c. 1899: 1.565). In these triadic relations the foundations specify the several relations in different ways, so that one relation is specified, for example, as "lover of", and another as "loved by" (1897: 3.466).

Thanks to their specification, triadic relations have a certain generality (c.1902a: 2.92; 1903: 1.26). Signs constitute one general class of triadic relations, and the laws of nature (which are expressed through signs) constitute the other general class (c. 1896: 1.480). Signs themselves are either genuine or degenerate. Genuine signs concern existential relations between interacting bodies and need an interpretant to be fully specified as signs (c.1902a: 2.92). For the genuine triadic sign relation is a mind-dependent similarity relation between the object of the existential relation and the existential relation itself as object for the interpretant (1904: 8.332). For example, words need an interpretant to be fully specified as signs. Triadic sign relations that are degenerate in the first degree concern existential relations between interacting bodies but require no interpretant to make them fully specified as signs. For example, a rap on the door means a visitor, with no explanation needed. Triadic sign relations that are degenerate in the second degree concern mind-dependent relations specified by the intrinsic possibility of the objects with which they are concerned, because these relations cannot vary between truth and falsity whatever any human group may think, as for example, in the case of mathematics, logic, ethics, esthetics, psychology, and poetry (1903a: 5.125; 1908: 6.455; c.1909: 6.328).

It is clear that when either science or literature, or anything in between, is considered in a semiotic framework as comprehensive as this, an exclusive treatment of its processes from the standpoint of constructed signs simply will not do. We risk being lost in crossword puzzles of great interest, maybe, but without validity as modes of understanding the semiosis peculiar to humanity as it extends

and links up again with the semiosis that weaves together human beings with the rest of life and nature.

Thus, the work of Peirce is regarded justly as the greatest achievement of any American philosopher, and at the same time the emergence of semiotic as the major tradition of intellectual life today throws the lost work of Poinsot into relief for its original contribution. Just as the writings of the American philosopher Charles Peirce first illustrated something of the comprehensive scope and complexity in detail of issues that need to be clarified and thought through anew in the perspective of semiotic, so did the Iberian *Tractatus de Signis* of John Poinsot first express the fundamental character of these issues in light of the ultimate simplicity of the standpoint determining the semiotic point of view. The Dean of Peirce scholarship, Max H. Fisch, comments with emphasis in this regard (1986) that, within its limits, Poinsot's work provides us with "the most *systematic* treatise on signs that has ever been written".

Just as semiotics itself appears today as a completely unexpected development within the traditionally established entrenchments of disciplinary specialization, so does it require a thorough re-examination of the relation of modern thought in its mainstream development to Latin times in general and to the Iberian Latin development in particular. In renewing the history of thought and restoring unity to the ancient enterprise of socalled philosophical understanding, Poinsot's work occupies a privileged position in the mainstream of semiotic discourse as we see it developing today. "Poinsot's thought", Sebeok points out (1982: x),

belongs decisively to that mainstream as the 'missing link' between the ancients and the moderns in the history of semiotic, a pivot as well as a divide between two huge intellective landscapes the ecology of neither of which could be fully appreciated prior to this major publishing event.

For the fundamental reason pointed out by Williams (1987a: 480) in observing "that historical narrative is the only logic capable of situating competing traditions and incommensurate paradigms in a perspective that not only lends each a higher degree of clarity on its own terms as well as in relation to the others, but also decides which paradigms will emerge as victorious", the perspective of semiotic requires of anyone seeking to adopt and develop it a cultivation also of a sense of how the transmissibility of the past in anthroposemiosis is an essential constituent and not something at the margins of present consciousness.

In this way, in particular, semiotics puts an end, long overdue, to the Cartesian revolution (the collection edited by Chenu 1984 is very helpful in this regard) and to the pretensions of scientific thought to transcend, through mathematical means, the human condition. The model for semiotics is rather that of a community of inquirers, precisely because "the human *Umwelt* presents us with a continuum of past, present, and future in which continuity and change,

convention and invention, commingle, and of which the ultimate source of unity is *time*" (Williams 1985: 274). Thus, the work of Williams (1982, 1983, 1984, 1985-1987, 1987a, 1988) and of Pencak (1987; Williams and Pencak, forthcoming) in penetrating the traditional field of historiographical study from an explicitly semiotic point of view, is one of the most essential advances in the developing understanding of semiotics today.

Eventually, we will see that the doctrine of signs requires for its full possibilities a treating of history as the laboratory within which semiosis, anthroposemiosis in particular, achieves its results, and to which it must constantly recur when an impasse is reached or new alternatives are required. Thirdness, after all, is what history is all about.

6. Jakob von Uexküll

So far, we have seen that the small number of pioneers—in particular, Poinsot, Peirce, and, to a lesser extent, Saussure—who tried to explore and establish directly the foundational concepts for a doctrine of signs found the way clogged with an underbrush of conceptual difficulties rooted in the prevailing thought structures and obstructing the access to the vantage point from which the full expanse of semiotic might be developed. Peirce, for this reason (c. 1907a: 5.488), described the pioneer work "of clearing and opening up" *semiotic* as the task rather of a *backwoodsman*.

Once the foundations have been secured, there remains the task of building the edifice and the enterprise of semiotic understanding, by elucidating at all points the crucial processes comprising the interface of nature and culture summed up in the term *semiosis*. This task, too, is clogged by underbrush accruing from presemiotic thought structures that must be cut away as semiotics reclaims from previous thought contributions essential to its own enterprise of reflective understanding.

We have now to see how the history and theory of semiotics includes as well background figures who, without explicitly understanding their work as semiotic, have made useful and even decisive contributions toward the recognition of what appears in its full propriety within the widening vista of semiotics. In the case of thinkers who did not deal directly, in the sense of with set and conscious purpose, with the notion of semiotic foundations, the wrestling in areas of semiosic functionings with conceptual difficulties accruing from obstructive thought structures is made all the more difficult for the want of an explicit entertainment of an alternative to the prevailing mindsets. In such a case, the very obstructions risk being incorporated into the creative conceptions themselves. When this happens, an inevitable degree of distortion results, to the extent that the creative novelties become assimilated to paradigms exclusive of the foundational clarity and expanse the perspective of semiotics could eventually provide.

There are thus three classes of what Rauch (1983) calls semiotists: there are the semioticians, workers who begin from the vantage point and within the perspective of the sign; there are the pioneers or founding figures of semiotics, the protosemioticians, who struggled to establish the essential nature and fundamental varieties of possible semiosis; and there are also, among the ranks of present and past workers of the mind, cryptosemioticians, who need themselves to become aware of the perspective that semiotic affords[49] or whose work needs to be by others reclaimed and re-established from within that perspective.[50] In particular, oppositions seemingly irreconcilable from the standpoint of the customary juxtaposition of idealism to realism often admit of subsumption within a higher synthesis from the vantage of semiotic. In such a way, apparent contradictions within the history of semiotics need not always remain so at the level of theory

Here, and by way of concluding our historical sketch, we will deal with the case of one of the greatest cryptosemioticians of the century immediately following the publication in 1867 of Peirce's "New List of Categories", Jakob von Uexküll. The *Umwelt-Forschung* he pioneered (1899-1940) is probably the most important recent illustration of a cryptosemiotic enterprise transcending, in the direction of semiotic, the limitations it otherwise imposed upon itself by embracing too intimately the mindset and paradigm immediately available in the milieu of the time and place.

When we talk of the Umwelt, as we have seen, we are talking about the central category of zoösemiosis and anthroposemiosis alike. The objective world generated at only these levels of semiosis finally constitutes, to borrow Toews's felicitous phrase (1987), "the autonomy of meaning and the irreducibility of experience" to anything that might be supposed to exist independently of it. This concept, belonging to the biological foundations that "lie at the very epicenter of the study of both communication and signification in the human animal" (Sebeok 1976a: x), we owe principally to the work of Jakob von Uexküll. So it is not surprising that von Uexküll has begun to emerge within contemporary semiotics as perhaps the single most important background thinker for understanding the biological conditions of our experience of the world in the terms required by semiotic.[51]

Having already shown synchronically how useful this concept is to semiotics, we will now look at von Uexküll's work diachronically in terms of its "semiotic lag", the phenomenon wherein the terms used in articulating a newer, developing paradigm inevitably reflect the older ways of thinking in contrast to which the new development is taking place, and hence constitute a kind of drag on the development, until a point is reached whereat it becomes possible to coin effectively a fresh turn of phrase reflecting precisely the new rather than the old. The new terminology has the simultaneous effect of ceasing the drag and highlighting what in fact was developing all along (cf. Merrell 1987).

In the case of Jakob von Uexkll, the drag is a consequence of having rooted his biological theories to an eventually counterproductive degree in the philosophy of Immanuel Kant (1781, 1787). On the positive side, it was Kant who best focussed thematic attention on the constructive regularities at work from the side of the subject in establishing the objects of experience so far as they belong to the phenomenal realm of the appearances of everyday life. Appreciation of the constructive role of the cognitive powers of the knowing subject and of that subject's affective shaping of cognitive content in the presentation through perception of what is known was, to be sure, an essential advance of philosophical understanding in the matter of dealing theoretically with the origins of knowledge and the nature of experience in the assessments of belief and practices. The emphasis on these matters communicated from Kant to von Uexküll was indispensable.

Dispensable was the Kantian failure to deal with the rationale according to which the constructive elements contributed by the subject—socalled concepts or ideas—are abductively arrived at as necessary postulates in the first place. This rationale was one of the several threads in the discussions crucial for epistemology that developed over the closing Latin centuries—particularly in Iberia—and were lost to the modern development as it took place, after Descartes, through the Latin filter of Suarez's *Disputationes Metaphysicae* of 1597.

In the German and Kantian context—even more, if possible, than in the modern context generally—the opposition of the terms "subjective" and "objective" is a firmly established dichotomy whose transparency is self-evident. Within this context, von Uexküll himself, who, as his son notes (T. von Uexküll 1981: 148), did not think of his work thematically under the rubric of semiotic, had little alternative to seeing the Umwelt in opposition to the supposed and so-called objective, and as belonging to the phenomenal realm in Kant's sense—on the side of the "subjective", that is, dichotomically conceived in opposition to the supposed "objective".

The want of alternative for von Uexküll himself has resulted in considerable confusion regarding his work in general (through misplaced associations with "vitalism") and, specifically, in notorious difficulties in interpreting (or "translating") the key term, "Umwelt".[52] The difficulties are a clue to the real problem.[53] As far as semiotics is concerned, von Uexküll's work needs to be thought through afresh at the level of basic terminology generally and specifically as regards the extent of reliance placed on the Kantian scheme for philosophy of mind.

T. von Uexküll, for example, in explaining his father's work for the context of semiotics today, unwittingly brings out the inconsistency that obtains between an orthodox Kantian perspective and the perspective of semiotic. According to the son's account (I choose an example where the inconsistency that runs throughout the account is concisely illustrated within one short paragraph, T.

von Uexküll 1981: 161): on the one hand, "A schema is a strictly private program" for the formation of complex signs "in our subjective universe"; and, on the other hand, "The schemata which we have formed during our life are intersubjectively identical" at least "in the most general outlines". But, of course, to speak of the intersubjective save as a pure appearance, in a Kantian context, is as internally inconsistent as to speak of a grasping of the *Ding-an-sich* in that same context (as Hegel best noted).

The conflict, thus, is between an idealist perspective in which the mind knows only what it constructs and the semiotic perspective in which what the mind constructs and what is partially prejacent to those constructions interweave objectively to constitute indistinctly what is directly experienced and known.

Himself immersed in the Kantian philosophy—that is, the most classical of the classical modern idealisms—Jakob von Uexküll yet was creating in spite of that immersion, through a creative intuition of his own, a notion anticipating another context entirely, a context which had yet to catalyze thematically and receive general acceptance under its own proper name, to wit, the context of semiotic as the doctrine of signs. He was inadvertently precipitating a paradigm shift. A formula I applied to Heidegger (1986: 56), *mutatis mutandis* (that is, substituting "biologist" for "philosopher" and "from within" for "against") can be applied to Jakob von Uexkll: among modern biologists he is the one who struggled most from within the coils of German idealism and in the direction of a semiotic.

For, unlike Heidegger, who expressly wrestled with reaching an alternative to the existing paradigms both realist and idealist, von Uexküll embraced a horn of the false dilemma: he saw himself as merely extending the Kantian paradigm to biology. He did not see that such an "adaptation" presupposed a capacity of human understanding incompatible with the original claims Kant thought to establish for rational life by his initiative. In other words, to apply Kant's paradigm as von Uexküll intended, it was necessary in the application already to transcend the paradigm—an adaptation of the original through mutation indeed.

The genuine adoption by a human observer of the point of view of another life form, on which Umwelt research is predicated, is a-priori impossible in the original Kantian scheme. Either *Umweltensforschung* is a form of transcendental illusion, or, if it is valid—if, for example, von Frisch really did interpret with some correctness the bee's dance or von Uexküll the toad's search image—then von Uexküll, in extending Kant's ideas to biology, was also doing something more, something that the Kantian paradigm did not allow for, namely, achieving objectively and grasping as such an intersubjective correspondence between subjectivities attained through the sign relation.[54]

Once it is understood that the classical terms of the subject-object dichotomy are rendered nugatory within the perspective of a doctrine of signs and that, within this context, the term "objective" functions precisely to mean the prospectively intersubjective, in opposition to both terms of the dichotomy classically understood, new possibilities of understanding are opened up. These possibilities are more in line with what is at the center of, the original to, von Uexkll's work than could be seen through the filter of Kantian idealism, which provided at the time the only developed language available to a scientist of philosophical bent. As "a consistently shared point of view, having as its subject matter all systems of signs irrespective of their substance and without regard to the species of the emitter or receiver involved" (Sebeok 1968: 64), semiotics requires a theoretical foundation equally comprehensive. That foundation can be provided only by an understanding of the being with its consequent causality and action proper to signs in their universal role. With all the subdivisions, neither a perspective of traditional idealism nor of traditional realism has the required expanse.

As semiotics comes of age, it must increasingly free itself from the drag of pre-existing philosophical paradigms. Beginning with the sign—that is, from the function of signs taken in their own right within our experience (semiosis)—it is the task of semiotics to create a new paradigm—its ownand to review, criticize, and improve wherever possible all previous accounts of experience, knowledge and belief in the terms of *that* paradigm. It is thus that the *history* of semiotics and the *theory* of semiotics are only virtually distinct, forming together the actual whole of human understanding as an achievement, a *prise de conscience*, in process and in community.

The maxim for that process, accordingly, is the same as the maxim for semiotics itself: *Nil est in intellectum nec in sensum quod non prius habeatur in signum* ("There is nothing in thought or in sensation which is not first possessed in a sign").[55] For if the *anthropos* as semiotic animal is an interpretant of semiosis in nature and culture alike, that can only be because the ideas of this animal, in their function as signs, are not limited to either order, but have rather, as we explained above, the universe in its totality—"all that wider universe, embracing the universe of existents as a part"—as their object.

Semiotics: Nature and Machine

Semiotics (from the Greek word for sign) is the doctrine and science of signs and their use. It is thus a more comprehensive system than language itself and can therefore be used to understand language in relation to other forms of communication and interpretation such as nonverbal forms. One can trace the development of semiotics starting with its origins in the classical Greek period (from medical symptomatology), through subsequent developments during the Middle Ages (Deely 2001), and up to John Locke's introduction of the term in the seventeenth century. But contemporary semiotics has its real foundations in the

nineteenth century with Charles Sanders Peirce (1839–1914) and Ferdinand de Saussure (1857–1913), who, working independently of each other, developed slightly different conceptions of the sign. The development of semiotics as a broad field is nevertheless mostly based on Peirce's framework, which is therefore adopted here.

Ever since Umberto Eco (1976) formulated the problem of the "semiotic threshold" to try to keep semiotics within the cultural sciences, semiotics—especially Peircian semiotics—has developed further into the realm of biology, crossing threshold after threshold into the sciences. Although semiotics emerged in efforts to scientifically investigate how signs function in culture, the twentieth century witnessed efforts to extend semiotic theory into the noncultural realm, primarily in relation to living systems and computers. Because Peirce's semiotics is the only one that deals systematically with nonintentional signs of the body and of nature at large, it has become the main source for semiotic theories of the similarities and differences among signs of inorganic nature, signs of living systems, signs of machines (especially computer semiotics, see Andersen 1990), and the cultural and linguistic signs of humans living together in a society that emphasizes the search for information and knowledge. Resulting developments have then been deployed to change the scope of semiotics from strictly cultural communication to a biosemiotics that encompasses the cognition and communication of all living systems from the inside of cells to the entire biosphere, and a cybersemiotics that in addition includes a theory of information systems.

Biosemiotics and Its Controversies

Semiotics is a transdisciplinary doctrine that studies how signs in general —including codes, media, and language, plus the sign systems used in parallel with language—work to produce interpretation and meaning in human and in nonhuman living systems as prelinguistic communication systems. In the founding semiotic tradition of Peirce, a *sign* is anything that stands for something or somebody in some respect or context.

Taking this further, a sign, or *representamen,* is a medium for communication of a form in a triadic (three-way) relation. The representamen refers (passively) to its object, which determines it, and to its *interpretant,* which it determines, without being itself affected. The interpretant is the interpretation in the form of a more developed sign in the mind of the interpreting and receiving mind or quasi mind. The representamen could be, for example, a moving hand that refers to an object for an interpretant; the interpretation in a person's mind materializes as the more developed sign "waving," which is a cultural convention and therefore a symbol.

All kinds of alphabets are composed of signs. Signs are mostly imbedded in a sign system based on codes, after the manner of alphabets of natural and

artificial languages or of ritualized animal behaviors, where fixed action patterns such as feeding the young in gulls take on a sign character when used in the mating game.

Inspired by the work of Margaret Mead, Thomas A. Sebeok extended this last aspect to cover all animal species–specific communication systems and their signifying behaviors under the term *zoösemiotics* (Sebeok 1972). Later Sebeok concluded that zoösemiotics rests on a more comprehensive *biosemiotics* (Sebeok and Umiker-Sebeok 1992). This global conception of semiotics equates life with sign interpretation and mediation, so that semiotics encompasses all living systems including plants (Krampen 1981), bacteria, and cells in the human body (called *endosemiotics* by Uexküll, Geigges, and Herrmann 1993). Although biosemiotics has been pursued since the early 1960s, it remains controversial because many linguistic and cultural semioticians see it as requiring an illegitimate broadening of the concept of code.

A code is a set of transformation rules that convert messages from one form of representation to another. Obvious examples can be found in Morse code and cryptography. Broadly speaking, code thus includes everything of a more systematic nature (rules) that source and receiver must know a priori about a sign for it to correlate processes and structures between two different areas. This is because codes, in contrast to universal laws, work only in specific contexts, and interpretation is based on more or less conventional rules, whether cultural or (by extension) biological.

Exemplifying a biological code is DNA. In the protein production system —which includes the genome in a cell nucleus, the RNA molecules going in and out of the nucleus, and the ribosomes outside the nucleus membrane—triplet base pairs in the DNA have been translated to a messenger RNA molecule, which is then read by the ribosome as a code for amino acids to string together in a specific sequence to make a specific protein. The context is that all the parts have to be brought together in a proper space, temperature, and acidity combined with the right enzymes for the code to work. Naturally this only happens in cells. Sebeok writes of the genetic code as well as of the metabolic, neural, and verbal codes. Living systems are self-organized not only on the basis of natural laws but also using codes developed in the course of evolution. In an overall code there may also exist subcodes grouped in a hierarchy. To view something as encoded is to interpret it as-*sign*-ment (Sebeok 1992).

A symbol is a conventionally and arbitrary defined sign, usually seen as created in language and culture. In common languages it can be a word, but gestures, objects such as flags and presidents, and specific events such as a soccer match can be symbols (for example, of national pride). Biosemioticians claim the concept of symbol extends beyond cultures, because some animals have signs that are "shifters." That is, the meaning of these signs changes with situations, as for instance the head tossing of the herring gull occurs both as a precoital display and

when the female is begging for food. Such a transdisciplinary broadening of the concept of a symbol is a challenge for linguists and semioticians working only with human language and culture.

To see how this challenge may be developed, consider seven different examples of signs. A sign stands for something for somebody:

1. as the word *blue* stands for a certain range of color, but also has come to stand for an emotional state;
2. as the flag stands for the nation;
3. as a shaken fist can indicate anger;
4. as red spots on the skin can be a symptom for German measles;
5. as the wagging of a dog's tail can be a sign of friendliness for both dogs and humans;
6. as pheromones can signal heat to the other sex of the species;
7. as the hormone oxytocin from the pituitary can cause cells in lactating glands of the breast to release the milk.

Linguistic and cultural semioticians in the tradition of Saussure would usually not accept examples 3 to 6 as genuine signs, because they are not self-consciously intentional human acts. But those working in the tradition of Peirce also accept nonconscious intentional signs in humans (3) and between animals (5 and 6) as well as between animals and humans (4), nonintentional signs (4), and signs between organs and cells in the body (7). This last example even takes special form in *immunosemiotics,* which deals with the immunological code, immunological memory, and recognition.

There has been a well-known debate about the concepts of primary and secondary modeling systems (see for example Sebeok and Danesi 2000) in linguistics that has now been changed by biosemiotics. Originally language was seen as the primary modeling system, whereas culture comprised a secondary one. But through biosemiotics Sebeok has argued that there exists a zoösemiotic system, which has to be called primary, as the foundation of human language. From this perspective language thus becomes the secondary and culture tertiary.

Cybersemiotics and Ethics

In the formulation of a transdisciplinary theory of signification and communication in nature, humans, machines, and animals, semiotics is in competition with the information processing paradigm of cognitive science (Gardner 1985) used in computer informatics and psychology (Lindsay and Norman 1977, Fodor 2000), and library and information science (Vickery and Vickery 2004), and worked out in a general renewal of the materialistic evolutionary worldview (for example, Stonier 1997). Søren Brier (1996a, 1996b) has criticized the information processing paradigm and second-order cybernetics, including Niklas Luhmann's communication theory (1995), for not being able to

produce a foundational theory of signification and meaning. Thus it is found necessary to add biosemiotics ability to encompass both nature and machine to make a theory of signification, cognition and communication that encompass the sciences, technology as well as the humanities aspect of communication and interpretation.

Life can be understood from a chemical point of view as an autocatalytic, autonomous, autopoietic system, but this does not explain how the individual biological self and awareness appear in the nervous system. In the living system, hormones and transmitters do not function only on a physical causal basis. Not even the chemical pattern fitting formal causation is enough to explain how sign molecules function, because their effect is temporally and individually contextualized. They function also on a basis of final causation to support the survival of the self-organized biological self. As Sebeok (1992) points out, the mutual coding of sign molecules from the nervous, hormone, and immune systems is an important part of the self-organizing of a biological self, which again is in constant recursive interaction with its perceived environment *Umwelt* (Uexkull 1993). This produces a view of nerve cell communication based on a Peircian worldview binding the physical efficient causation described through the concept of energy with the chemical formal causation described through the concept of information—and the final causations in biological systems being described through the concept of semiosis (Brier 2003).

From a cybersemiotic perspective, the *bit* (or basic difference) of information science becomes a sign only when it makes a difference for someone (Bateson 1972). For Pierce, a sign is something standing for something else for someone in a context. Information bits are at most pre- or quasi signs and insofar as they are involved with codes function only like keys in a lock. Information bits in a computer do not depend for their functioning on living systems with final causation to interpret them. They function simply on the basis of formal causation, as interactions dependent on differences and patterns. But when people see information bits as encoding for language in a word processing program, then the bits become signs for them.

To attempt to understand human beings—their communication and attempts through interpretation to make meaning of the world—from frameworks that at their foundation are unable to fathom basic human features such as consciousness, free will, meaning, interpretation, and understanding is unethical. To do so tries to explain away basic human conditions of existence and thereby reduce or even destroy what one is attempting to explain. Humans are not to be fitted and disciplined to work well with computers and information systems. It is the other way round. These systems must be developed with respect for the depth, multidimensional, and contextualizing abilities of human perception, language communication, and interpretation.

Behaviorism, different forms of eliminative materialism, information science, and cognitive science all attempt to explain human communication from outside, without respecting the phenomenological and hermeneutical aspects of existence. Something important about human nature is missing in these systems and the technologies developed on their basis (Fodor 2000). It is unethical to understand human communication only in the light of the computer. Terry Winograd and Fernando Flores (1987), among others, have argued for a more comprehensive framework.

But it is also unethical not to contemplate the material constraints and laws of human existence, as occurs in so many purely humanistic approaches to human cognition, communication, and signification. Life, as human embodiment, is fundamental to the understanding of human understanding, and thereby to ecological and evolutionary perspectives, including cosmology. John Deely (1990), Claus Emmeche (1998), Jesper Hoffmeyer (1996), and Brier (2003) all work with these perspectives in the new view of semiotics inspired by Peirce and Sebeok. Peircian semiotics in its contemporary biosemiotic and cybersemiotic forms is part of an ethical quest for a transdisciplinary framework for understanding humans in nature as well as in culture, in matter as well as in mind.

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