Jesper Hoffmeyer's Biosemiotic Legacy

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Jesper Hoffmeyer (1942–2019) passed away on September 25th 2019 at age 77. This issue features an obituary written by Claus Emmeche, Donald Favareau and Kalevi Kull on behalf of the International Society for Biosemiotic Studies (ISBS), for which Hoffmeyer was the first President (2005–2015), as well as an interview with Hoffmeyer. In this editorial, the Editors-in-Chief of *Biosemiotics* address his biosemiotic legacy, with special emphasis on his role for the journal *Biosemiotics*, the Biosemiotics book series, and his publications for Springer Nature.

Jesper Hoffmeyer was an encyclopedic thinker, whose interests included different threads in biology, philosophy and the humanities, many of which he synthesized. His importance to biosemiotics is too far-reaching to be covered comprehensively within the limits of this editorial. Ideas such as speciation by natural translation, the organismal self as a center of phenomenal experience, semiotic scaffolding and the role of emergence and downward causation in evolution illustrate the scope of the synthesis that he provided.

Hoffmeyer was among the first to focus attention on the topic known as semiotic agency. He emphasized that non-human organisms are true subjects: “Living creatures are self-referential, they have a history, they react selectively to their surroundings and they participate in the evolutionary incorporation of the present in the future” (Hoffmeyer 1996: 51). Hoffmeyer’s key concept in treating this subject is code-duality¹:

Code-duality refers to the fact that living systems always form a unity of two coded and interacting messages, the analogy coded message of the organism itself and its re-description in the digital code of DNA. As analog codes the organisms recognise and interact with each other in the ecological space giving rise to a

¹See the original paper on code-duality by Hoffmeyer and Emmeche (1991).

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horizontal semiotic system (the ecological hierarchy of Stanley Salthe (1985)), while as digital codes they are passively carried forward in time between generations (after eventual recombination through meiosis and fertilisation in sexually reproducing species). (Hoffmeyer 1998b: 34)

The ideas on code duality were inspired by Gregory Bateson's notion of "what he called the double stochastic system of biological evolution" (Emmeche et al. 2002: 39; cf. Bateson 1979) as well as Bateson's reading of Anthony Wilden's work.² They also closely resemble the concept of autopoiesis (Maturana and Varela 1980). Hoffmeyer's novelty is formulating this idea in semiotic terms. He viewed the origin of subjectness as "a process of asymmetry-formation through membrane closing followed by the development of mechanisms for semiotic interaction across the membrane" (Hoffmeyer 1998b). Hoffmeyer considered membranes or boundaries "as interfaces facilitating a highly regulated exchange of signs between interiors and exteriors" (Hoffmeyer 1998b). He argued that the asymmetry between a subject and its environment is simultaneously separating and uniting organisms from/with their environment because organisms develop models of the environment and "living organisms are inscribed in their environments". Thus, the unity is supported by the "'inside exterior' (the Umwelt) and the 'outside interior' ('the semiotic niche')". Hoffmeyer (1998b: 39) proposed the term "semetic interaction" for describing a component of the interface between a subject and its environment that enables cascades of relations between species based on meanings and habits. He wrote:

Semetic interactions refers to interactions in which regularities (habits) developed by one species (or individual, tissue, cell) successively become for sign-mediated interaction of organisms used (interpreted) as signs by the individuals of the same or another species, thereby eliciting new habits in this species eventually to become – sooner or later – signs for other individuals, and so on in a branching and unending web integrating the ecosystems of the planet into a global semiosphere (Hoffmeyer 1996).

Connecting the semiotic realm and ecosystem thinking in an original definition of the concept of *semiosphere* (a term known from the works of Yuri Lotman 1990) is another important point in the biosemiotic theory of Hoffmeyer:

The semiosphere is a sphere just like the atmosphere, the hydrosphere, and the biosphere. It penetrates to every corner of these other spheres, incorporating all forms of communication: sounds, smells, movements, colors, shapes, electrical fields, thermal radiation, waves of all kind, chemical signals, touching and so on. In short, signs of life (Hoffmeyer 1996: vii)

Hoffmeyer brought to biosemiotics the term "semiotic scaffolding" to describe the network of semiotic controls that are tuned to the needs of the system and support meaningful interpretation of signs (Hoffmeyer 2008a). The term "scaffolding" has been

² We thank Claus Emmeche for input on this point.

used in a semiotic context before (Wood et al. 1976; Bickhard 2005), but Hoffmeyer was the first to combine the two words “semiotic scaffolding” and apply the term to all living organisms. As he wrote (Hoffmeyer 2008a: 149):

Such semiotic controls may be distinguished from ordinary deterministic control mechanisms through an inbuilt anticipatory capacity based on a distinct kind of causation that I call here “semiotic causation” to denote the bringing about of changes under the guidance of interpretation in a local context.

The notion of semiotic scaffolding combines well with the concepts of agency, code-duality, the ideas of semiotic integration of organisms with their environment, and the semiosphere. Hoffmeyer (2015 (ed.)) edited a special issue of *Biosemiotics* devoted to semiotic scaffolding at various levels of biological organization. The opening paper, authored by Hoffmeyer, describes the emergence of more sophisticated scaffolding with the origin of eukaryotic cells and multicellularity. Other papers cover topics such as embryo development, symbiosis, mimicry, evolution, cognition, social interactions, and culture.

Hoffmeyer's Significance for *Biosemiotics* and the Biosemiotics Book Series

Jesper Hoffmeyer played a central role in the establishment of the journal *Biosemiotics*, as well as the establishment of a biosemiotic book series, both published by Springer.³ The idea of a journal devoted to biosemiotics was first discussed among key biosemioticians during the 4th Gathering in Biosemiotics, which was held in Prague, the Czech Republic in 2004. During an informal meeting, Marcello Barbieri, Claus Emmeche, Jesper Hoffmeyer, Kalevi Kull and Anton Markoš agreed that they would all serve as editors of a biosemiotic journal. A first agreement was made with Nova Science Publishers, a publisher with dubious editorial policies and peer-review practices. Two issues of *Journal of Biosemiotics* were published, both in 2005, with these five as editors. After some time, they experienced problems in correspondence with Nova Science Publishers, and decided to approach Springer. *Journal of Biosemiotics* was shut down, and an agreement eventually reached with Springer.

In parallel with the initiative to establish a biosemiotics journal, these same biosemioticians also made an effort to have a book series in biosemiotics established. During the 6th Gathering in Biosemiotics, in Salzburg, Austria, there was, according to Kalevi Kull, a small meeting between a representative for Springer and three biosemiotic scholars, namely Marcello Barbieri, Jesper Hoffmeyer, and himself. At the meeting they discussed the establishment of a book series on biosemiotic topics. Kull proposed that Barbieri and Hoffmeyer should be the editors for the book series, and this was agreed upon. Hoffmeyer remained an editor for the book series until his death. In 2014, Barbieri stepped down as book series editor, and was replaced with Kull and Alexei Sharov. According to Kull, “Jesper was always good-hearted in accepting

³ We thank Kalevi Kull for his input regarding Hoffmeyer's role for the *Biosemiotics* journal and the Biosemiotics book series. Kull was collaborating with Hoffmeyer in both contexts from the outset.

the volumes” for the book series. The first volume in the book series was published in 2008. To date 19 volumes have appeared in the series.⁴

At the same meeting in Salzburg in 2006, Hoffmeyer, Barbieri and Kull suggested to Springer that a biosemiotic journal could be published by them. The year after, in 2007, Springer agreed to start publishing *Biosemiotics*, and in 2008, the first issue appeared (for a depiction of the journal’s first ten years, see Maran et al. 2017). From 2008 and until 2013 Marcello Barbieri served as the sole Editor-in-Chief of *Biosemiotics*. For the first few years, until 2012, Jesper Hoffmeyer, Kalevi Kull, Anton Markoš and Donald Favareau served as Associate Editors for *Biosemiotics* (as did Claus Emmeche 2008–2010). Starting with *Biosemiotics* 5(3), published in December 2012, the former Associate Editors were moved to the Advisory Board of the journal, supplementing the existing members. Since *Biosemiotics* 7(3), published in December 2014, the journal has had an Editorial Board only, with no Advisory Board, and Hoffmeyer and the other initial Associate Editors have served as members of the Editorial Board.

Hoffmeyer’s Springer Nature Publications

Hoffmeyer’s Springer Nature publications count 16, comprising edited, authored and co-authored texts. Specifically, this pioneering Danish biosemiotician edited one book in the Biosemiotics book series, on the work of Gregory Bateson (Hoffmeyer (ed.) Hoffmeyer 2008), and one special issue of *Biosemiotics* (Hoffmeyer (ed.) Hoffmeyer 2015), on semiotic scaffolding – cf. previous mention. He authored four articles published in *Biosemiotics* singlehandedly (Hoffmeyer 2008d, 2015a, 2015b, 2018) and co-authored one more (Hoffmeyer and Stjernfelt 2016) – and authored four book chapters in volumes published in the Biosemiotics book series (Hoffmeyer 2008b, 2008c, 2010, 2012), as well as four more book chapters in other book volumes published by Springer Nature (Hoffmeyer 1998a, 2008a, 2013, 2014). He furthermore co-authored one article published in *Biological Theory* (Kull et al. 2009). With one exception (Hoffmeyer 1998a), these publications all appeared in the period 2007–2018, when Jesper Hoffmeyer was between 65 and 76 years old. In that respect, Hoffmeyer’s Springer Nature publications represent his late works, written in a period of life when most people have retired from professional activities.

In addition to editing a special issue of this journal, Hoffmeyer also participated in the initial organization and editing of papers which were eventually published in the special issue “Semiosis of evolution” (Sharov et al. 2016). The papers for this issue was originally planned to appear as a book volume. The idea of the project was that evolution should be treated as a form of semiosis, rather than treating semiosis as an aspect of evolution. Hoffmeyer’s co-authored contribution to this issue, “The great chain of semiosis. Investigating the steps in the evolution of semiotic competence” (Hoffmeyer and Stjernfelt 2016), provided an overview of the “progressive trends in evolution that might justify a scaling of species from primitive to advanced levels” (Hoffmeyer and Stjernfelt 2016, p. 7). The authors describe eleven steps of the evolution of semiosis, starting with molecular recognition and concluding with consciousness. The common thread in these steps is an “increasing subdivision and control

⁴ More information on the Biosemiotics book series is available here: <https://www.springer.com/series/7710>

of a primitive, holophrastic perception-action circuit already committed to 'proto-propositions' (dicisigns) reliably guiding action already in the most primitive species" (Hoffmeyer and Stjernfelt 2016, p. 7.).

Hoffmeyer's Vision for Biosemiotics

Jesper Hoffmeyer's works are at the heart of what has been called the Tartu-Copenhagen school of biosemiotics. Connections between scholars in Tartu (Kalevi Kull) and Copenhagen (Jesper Hoffmeyer, Claus Emmeche, Frederik Stjernfelt) appeared in the early 1990s, and later led to the establishment of the conference series *Gatherings in Biosemiotics* and the International Society for Biosemiotic Studies (ISBS). Other scholars that have been closely related with the group include Don Favareau, John Deely, Myrdene Anderson and Terrence Deacon. The Tartu-Copenhagen school found theoretical support mostly in the Umwelt theory of Jakob von Uexküll, the semiotic philosophy of Charles S. Peirce and the zoosemiotics of Thomas A. Sebeok. The importance of Hoffmeyer to Tartu biosemiotics is demonstrated by the two volumes of the book series that the Tartu Semiotics Library dedicated to discussion of his writings (Emmeche et al. 2002; Favareau et al. 2012).

A principle proposed and propagated by Jesper Hoffmeyer that has had a central role in the Tartu-Copenhagen school is that of taking signs as basic units in biology (instead of genes or populations), and in line with the thinking of Thomas A. Sebeok, to consider living processes and semiotic processes as intrinsically interconnected. Hoffmeyer avoided drawing strict thresholds of semiotic capacities in the living world, but considered the cell as a lower level of biological organization that yet has full interpretative capacities (Hoffmeyer 2008a: 154). Another core principle that Hoffmeyer stressed is the need for understanding the semiotic capacities of organisms as being related to their biological organization and ecology – and accordingly, to consider semiosis and subjectivity as more-or-less phenomena that have a tendency to grow during evolution. Any strict body-mind distinction is in consequence rejected. Hoffmeyer has also emphasized the special type of goal-directedness – semiotic causation (resembling final causation) – that semiotic processes bring into the biological world as a result of their inherent anticipatory capacities.

In some secondary sources, Jesper Hoffmeyer is interpreted as a Peircean scholar that has propagated an interpretation-centered view of biology. Although Hoffmeyer was indeed influenced by Peirce's semiotics, this appears to be an over-simplification. In his works, Hoffmeyer combines and synthesizes many influences, such as the cybernetics of Gregory Bateson, the phenomenology of Hans Jonas and Maurice Merleau-Ponty, the views on evolution by James M. Baldwin and Terrence Deacon, and many others. Interdisciplinarity in thinking and science was highly valued by Hoffmeyer, and his works are much richer than what simply applying Peirce to biology would result in.

Some of the disagreement between traditional biology and Peircean biosemiotics has concerned whether or not new methods of science are required in order to properly address biosemiotic issues. In our opinion, allegations that Hoffmeyer's approach to biosemiotics was not sufficiently scientific are unfair. Jesper Hoffmeyer's position was consistently that a reform of the scientific mindset is required. This approach was

rooted in philosophy of science, of which Hoffmeyer had a good knowledge (e.g. the works of K. Popper, H. Pattee, N. Bohr, P. V. Christiansen). His opposition to the “standard methods of science” was no fight with science as such, instead, it was a fight for an improved and more comprehensive science capable of addressing biosemiotic issues. Such a project is justified also in light of the history of science generally, and the history of biology in particular. New methods of science always contradict the currently established scientific thought. That does not make them unscientific. Needless to say, their theoretical grounding has to be critically assessed, and they have to prove their worth, for them to become part of the future scientific mindset.

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