THEMATIC SECTION: FAUNA, FLORA, OTHER LIVING BEINGS AND ENVIRONMENTS IN SCIENCE AND BIOLOGY EDUCATION

Encounters between Literature and Biology Teaching: an interview with Maria Esther Maciel

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Luís Henrique Sacchi dos Santos, Leandro Belinaso, Daniela Ripoll (Editors): In an 2021 interview published on *Revista Dobra,* you say that "[…] it is up to us, humans, to try to imagine what goes on in the intimate sphere of an animal since our reason is insufficient for this. Poets and writers give themselves this imaginative task of entering non-human subjectivity" (Maciel, 2021b). Biology teaching, as any epistemic field producing knowledge and practice, has a history, a culturally constructed curriculum in which the cognitive and informative dimension of training is preponderant. Although research on biology teaching has problematized this constitutive aspect, sciences classes at schools still have little space for the ethical and aesthetic dimensions of training related to otherness, sensitivity, and estrangement. We know you are not dedicated to thinking about teaching in your academic and literary works, and that art in general (and literature in particular) must not answer questions of the world. However, as you refer to Coetzee's[1] character Elizabeth Costello – "what can literature do in the face of all this?" (Maciel, 2021a) – do you think that teaching about living beings could offer more sensitive contagions between children and young people with other animals at schools? If, as you say, poetry, literature, and art enable us to engage in other encounters (which may be less hierarchical with non-humans), what kinds of encounters other than those via cognition and reason could be promoted with non-humans?

Maria Esther Maciel: Anyone with empathy and sensitivity can imagine what goes on in the intimate sphere of an animal and put themselves in its place. What poets and writers do is turn this experience into a verbal record, leading us to a kind of knowledge other than the merely rational one of non-human alterities. In view of this, teaching about living beings should not be limited only to knowledge legitimized by reason and scientific knowledge, but should also remain open to this exercise of affections and senses. Biology studies, if contaminated by alternative modes of apprehension of the world and the living beings inhabiting it, can break curricular boundaries, also potentiating themselves as creative spaces of research and training. If training someone is giving them a form by instruction and improvement, this process intensifies itself by untying the shape of formulas and deviating from curricular limits.

This has already been practiced by some scientists, such as the Belgian ethnologist and writer Vinciane Despret, who articulates her scientific research with greatly inventive narrative strategies in her book *What Would Animals Say If We Asked the Right Questions?*, composing a fun alphabet that circumvents taxonomic norms and incorporates fable procedures to describe the behavioral peculiarities of different animals, with emphasis on the intelligence of these living beings. Another naturalist who uses inventiveness to delve into the non-human living world is the French Bill François, with his "incredible stories of the underwater world" gathered in the volume *Eloquence of the Sardine*, which deals with the inhabitants of ocean waters and their knowledge about life.

I believe that these authors show by oblique means how much literature and the arts contribute to the discovery of other types of knowledge about life around us. This is because, in them, cognition is linked to sensoriality and imagination, enabling our encounter with non-humans to occur in a more intrinsic and sensitive way, even if it does not allow us to fully cross what writer and artist John Berger[2] called the "abyss of non-understanding" that divides us from them. If literature need not answer the questions of the world, it indeed can provoke new questions and show us that there are no definitive answers to what is constantly moving and surprising us every moment. As Carlos Drummond wrote in his poem "Natural History", the "world is not as we think":

> Blind snakes are nocturnal.
> The orangutan is deeply lonely.
> Monkeys also prefer isolation.
> Certain trees only bear fruit every 25 years.
> Swallows mate in flight.
> The world is not as we think (Andrade, 2002, p. 22).

Living with animals also teaches us a lot about them outside the limits of science, provided that they are not transformed into mere objects of observation or in toys at the service of human entertainment. Looking *at* animals – exchanging glances with them if possible – peering at them without invading their spaces of intimacy, respecting their particularities as living beings, recognizing that they are subjects which suffer and

have feelings and intelligence contribute to enable less hierarchical approximations. Of course this does not work for all species as there are those which are aggressive or indifferent to human contact, refractory against the invasion of their space. Not all allow an interaction. Yet they all deserve our respect, they all are part of the living web of the world.

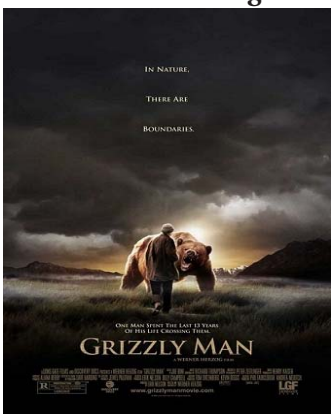
Editors: Your book *Literatura e animalidade* [Literature and animality] (Maciel, 2021a) shows a desire (at least how we read it) that we move away from an essentially human subjectivity and open ourselves to what you call "hybrid forms of existence." It says, "[...] man becomes a wolfman not by genealogy or evolution, but by contagion" (Maciel, 2021a, p. 25). It immediately reminded us of the book *In the Eye of the Wild*, by anthropologist Nastassja Martin. In it, a kind of diary, a field notebook, is produced through a body in transformation, a writing contaminated by words in tension, in a erasure, by words woven at the limit, in a borderline situation. The anthropologist reminds us that we live in a world inhabited and traversed by other living beings. It is amazing to think that such a finding, as simple as it may seem, is not automated in us, even in us, biology teachers and teachers who teach about non-human lives. Other living beings, if they do not make us sick us or become our pets or our consumer products, seem to be very far from us, on another planet even, especially for those who live in urban conglomerates. In any case, what we would like to point out by our recollection of this diary-book is that its author narrates, from an encounter with a bear, her slow transformation into a hybrid existence, as if something of the bear now inhabited her body and subjectivity. She wonders all the time if the same transformative effect also happens with the bear. In your opinion – and perhaps answering as Zenóbia, your "pet zoologist/botany", who seems to us (as Elizabeth Costello is to Coetzee) your closest alter ego and to whom you even devote your *Pequena enciclopédia de seres comuns* [Little Encyclopedia of Common Beings] (Maciel, 2021c), biology or its teaching could be allies or "stronger allies" of contagion practices and the imaginative and creative processes inscribing "hybrid forms of existence" in the world? And why would such a formative horizon involved in erasuring an essentially human or animal cultural identity, be important for the coexistence of different living beings, seen as a departure, perhaps, in Bruno Latour's terms (1994), as nature-culture hybrids?

Maria Esther Maciel: By bringing the book *In the Eye of the Wild* to the discussion of hybrid forms of existence, you imprint an even greater complexity to the issue and trigger new reflections. Undoubtedly, the impressive account of young anthropologist Nastassja Martin about her encounter/collision with a bear in the Kamchatka mountains, which lead her not only to cross the borders between the human and non-human worlds, but also leaves in her body and history an inscription/scar carrying all the force of contagion and impregnation. An experience transformed into words both forceful and poetic.

Roland Barthes used the word *imprinting* to designate what leaves a mark, an impression in the other. That's what simultaneously happens to the anthropologist and the bear. It rips a part of her face and three of her teeth in addition to breaking her right zygomatic bone, causing her many injuries. She, with a cutting instrument used in mountaineering activities, reacts and attacks the beast that, also injured, abandons its prey and flees. This is a struggle provoked by what the Portuguese writer Maria Gabriela Llansol would call "an unexpected encounter with diversity". Woman and beast look at each other and, in this exchange of glances, erase the borders that separate them as species. These are two animalities facing each other from which result two subjectivities crossed by a reciprocal contagion and new forms of existence for both living beings. In each body, an inscription, an imprinting.

This book could not but remind me of a movie I saw many years ago: Werner Herzog's *Grizzly Man* (2005), which tells an even more tragic story of a crossing of borders between a man and the bears he studied and with which he lived in Alaska (Figure 1). The final devouring of that man by one of the beasts tells us that, in this crossing of the boundaries between the human and the non-human, there is a point that cannot be overcome since, in the "encounter with diversity", differences do not disappear, intrinsic individualities are maintained, distance is sustained in proximity. There is always a limit in the very crossing of limits. Timothy Treadwell[3], after 10 years researching and filming in bear territory, went beyond what the beasts allowed and broke the boundary of differences. Therefore, such a sad end.

Figure 1 – Original poster of the movie *Grizzly Man* (2005) by Werner Herzog



Source: Available at: https://pt.wikipedia.org/wiki/Ficheiro:Grizzly_Man.jpg.

Book and film show, thus, that the "abyss of misunderstanding" is not just a metaphor. It becomes necessary, in the face of stories like these, what Mathew Callarco, in his book *Thinking Through Animals* (2015), called an ethics of difference in the treatment of non-human alterities since other living beings are ethically different from us and irreducible

to our ways of understanding, projects, and interests despite several of them possessing faculties and skills that are often confused with ours.

Biology studies can certainly be allied to these teachings literature, cinema, and other arts bring to this field of (transferable or resistant) boundaries between nature and culture. Zenóbia has shown me this in several of her writings on animals and plants. That's why I called her my "pet zoologist/botanist." She knew how to learn about the living world also by heart, *par coeur*, as Derrida would say, and sought to teach this to her disciples. But, in this case, it is a heart that is not confused with the organ "filed in electrocardiograms, an object of knowledge and techniques." Hence, the knowledge arising from this experience is also not imprisonable in scientific categories, techniques, and manuals.

Editors: We see some connections between two of your books, which have been published more than a decade apart from each other. We refer to *O livro dos nomes* [The book of names] (Maciel, 2008) and *Pequena enciclopédia de seres comuns* [Little Encyclopedia of Common Beings] (Maciel, 2021c). We see, in both works, the construction of a common crossed by peoples, animals, and plants. A common that proves to be hybrid by unfolding the meanings conferred to the popular names of living beings. In both, fiction is the key to the reader's encounter with these varied, strange, and unclassifiable lives. In fact, *As ironias da ordem* [The ironies of order] (Maciel, 2009) evinces your enthusiasm for the provocation, through literature and academic research, of a strangeness to this classifying impetus, to this claim of ordering that marks many cultural practices since the advent of the Enlightenment in the 18th century – such as zoological collection organizations, to which you dedicate a chapter in that book. As you may suppose, this classifying impetus strongly enters the teaching of biology, imbuing it with precisely delimiting living beings, separating, describing, and placing them in their proper ordination. Nothing further from the provocation found in your writings. In them, living beings emerge narrated from confusion, culture, strangeness, mixing, hybridization, disorder, and intersections. All this "jerry-rigging" is already present, you seem to tell us, in the popular names given to beings. Such common names are not concerned with purity, with an accurate cataloguing of life. In teaching biology, the strength of classification, order, and precision may require an overly explanatory teaching gesture, controlling the knowledge circulating in pedagogical practices and with this, a teaching focused on collective creation and narrative invention is demobilized. Do you believe that teaching based only on the informative explanation of scientific consensus impacts the ways in which living beings are narrated in classrooms? Do you imagine that it would be possible to approximate the teaching of biology to what you call animal reason, whose living expression is produced by affection, by the body? How could this take place? Also, could you comment on the relation between your works on names, inventories, and collections (perhaps more focused on the writer's domains) with those more centered on discussing the relational field between animality and literature (which could be found in more

academic domains)? Is there any separation between the writer and the researcher or do they both drink from the same sources?

Maria Esther Maciel: For me, the work of a teacher/researcher and that of a writer are not dissonant activities. They are distinct but related experiences that nourish each other. My academic research and classroom activities have always been important for my learning/improvement as a poet and fiction writer. The research I do is still strongly focused on my creative work. On the other hand, the poetic-fictional exercise permeates my academic work in different ways. When I began my research on the critical-creative uses of world classification systems and knowledge, I also began to adopt many taxonomic procedures in my poetry and fiction. My essay books *A memória das coisas* [The memory of things] and *As ironias da ordem* [The ironies of order], both about the presence of lists, inventories, catalogs, encyclopedia and dictionary entries in the works of writers and artists, had their fictional counterpart in *O livro de Zenóbia* [The book of Zenóbia] and *O livro dos nomes* [The book of names]. It was also thanks to this research, which expanded quite a lot, that I ended up in old natural encyclopedias and medieval bestiaries. Reading Aristotle's *History of animals*, parts of Pliny the Elder's *Natural history*, Saint Isidore of Seville's *Etymologiae*, and Borges' *Manual de zoología fantástica* was my way to access (or return) to the universe of animals and plants. I say "return" because this universe has always been present in my personal history.

In the first moment of my research on the zoo world, I focused on collections of existing and fantastic animals, moving to the descriptive and illustrated catalogs of the medieval era until I reached some 20th-writers who also composed small poetic-fictional encyclopedias about animals, among them, Jorge Luis Borges, and his *Manual de zoología fantástica* [Manual of Fantastic Zoology], which unfolded in *The Book of Imaginary Beings*. Several modern and contemporary writers have entered my *corpus*, all involved in the creation of what I have come to call literary "zoo collections". I continued to think about the issue of insufficient and provisional scientific classifications, motivated, above all, by the disconcerting figure of the platypus and the category of "etcetera", which escape conventional ordinations and put to the test legitimized definitions. The platypus, as we know, has bird, fish, and quadruped characteristics and cannot be entirely confined in any zoological category. It challenged the knowledge of English taxonomists when it was found in Australia in the late 18th century, becoming, by its hybrid character, a symbol of what could never be convincingly classified.

Later, my gaze focused on other literary, cultural, ethical, and political records of this universe beyond catalogs and collections. And that was what led me to a broader and transdisciplinary reflection on the issue of the animal, animality, and the limits of the human. To this end, I began to research narratives and poetics from different contexts, focused on these issues of the animal world and attentive to ethical, political, and ecological issues in the light of different disciplinary fields.

In the context of literary creation, *Pequena enciclopédia de seres comuns* [Little encyclopedia of common beings] (Maciel, 2021c) incorporates all these elements. It is a hybrid, like the platypus, playing with onomastics and encyclopedic entries and incorporating "etcetera." In it, I seek to show that the natural world is prodigal in the non-human species and individuals that surprise our imagination. Many confuse taxonomic criteria, seeming to have come out of fantastic literature books. Popular imagination tried to bring these fabulous, unclassifiable, and disconcerting aspects to the common names of these creatures, relying on free associations, beliefs, superstitions, legends, and licenses of imagination. This is what I tried to explore in the entries of my book without giving up the scientific nomenclatures and information found in zoology compendiums.

Finally, I believe that teaching centered only on the informative explanation of scientific consensus tends to excessively rationalize the approach to living beings in classrooms, subtracting from them the condition of subjects, of living beings participating with us in the orchestra of nature. Imprinting a dose of sensitivity in this approach is fully possible in teaching biology, as well as facilitating the reason for affection and body sensoriality, allowing the living expression of an animal reason to surface.

Editors: We would now like to propose a simpler, but perhaps not easier, question than our previous ones. Much of what exists in the world is perhaps created in our reading gestures. A book like *Jardim Zoológico* [The Zoo] by Wilson Bueno (1999), which you like and cite in some of your works, moves us by connecting to our ancestral Amerindian history while leaving us astonished, lost. All those unlikely lives come into existence in the act of reading. With this note we want to highlight the importance of choosing the repertoires of reading, writing, and imagery, which we offer to our students, something that has been defended for years by the field of Cultural Studies in Education[4]. In a 2020 interview for *Revista Cult*, focused on discussing your poetic works, you end it by claiming that "[…] to write at this time in the world is to cross the borders of our own humanity to see if there are still possible paths to a life worth living and writing" (Maciel, 2020, n.p.). If writing is a way to move and stay alive, the act of reading may be a possibility to expand and intensify life. Thus, would you agree with the assumption that teaching biology (though not just it), teaching about non-human lives, would necessarily include promoting other fictional, poetic writings and expanding reading horizons in classrooms?

Maria Esther Maciel: The instigating book *Jardim zoológico* by Wilson Bueno (1999) is part of the order of the platypus given the hybrid and unclassifiable dimension it presents. The writer from Paraná could, like few, play with taxonomies, parody ancient bestiary entries, invent a mixed-race language. His animals are borderline, transnational, and cross-cultural. It has another differential regarding what is expected of a "bestiary": Bueno's animals live their own corporality and demonstrate

their affections and knowledge about the world. Hence I often evoke him in my work. It is a book that can, in my view, play an important role in the teaching of biology by staging the aforementioned "animal reason." Something another author – the Italian Alessandro Boffa – did by very different mean in his book *You're an animal, Viskovitz* (Boffa, 1999). A trained biologist, he parodied the technical language of biological sciences treatises to make a humorous series of 20 short stories which always star an animal named Viskovitz, which acquires the form of different species, ranging from microbe to pig. He ironically shuffles the boundaries between human and non-human in clear criticism of the ways science has dealt with animals. It might be an interesting read to biology students because it shows how fiction can transfigure scientific knowledge through fable, humor, and inventive reflection.

I remember what Indigenous leader Ailton Krenak said in one of his books. According to him, humanity "[...] is removing itself in an absolute manner from this living organism that is the earth" (Krenak, 2019). To postpone the end of the world, we need to take advantage of our subjectivities, our poetic visions of existence. This could also be taken to the teaching of biology because this responsibility also rests with everyone who turn to the life sciences. Bringing to students other writings based on these subjectivities and visions can awaken in them the need to reinvention our relationship with the natural world.

The act of reading poetry and fictional narratives becomes, as you well observed, a possibility to expand and intensify life. To use the words of the Argentine writer Ricardo Piglia: "in reading, all emotions of the body are present, mixed, coiled". Unsurprisingly, it is the greatest impetus to the act of writing, as attested by countless writers in different times.

Editors: In the mid-1990s, Maria Lúcia Wortmann, Nadia Souza, and Eunice Kindel (1997) organized the collection *O estudo dos vertebrados na escola fundamental* (The study of vertebrates in elementary school). It defends ecological, historical, and evolutionary perspectives in the study of these animal groupings and an acid criticism of utilitarianism and anthropocentric narratives that value, with overly human attributes, the behaviors of non-human animals. It is amazing to realize the actuality of this work. It reminds us of the verses of the poem "escondido" (hidden) by Adriana Lisboa (2021, n.p.), published in *O Vivo*:

> unfailingly simple
> what he had to say
> and so simple
> that we've never been able to put it into practice

The criticism of utilitarianism and anthropocentrism has permeated the teaching of biology and environmental education in recent decades. A simple and, at the same time, critical message that is so difficult to put into practice. There is a forceful phrase in the essay written by John Berger (in 1977, but published in Brazil in 2021) entitled *Why look at animals?* It says, "The more we know, the further away they [animals]

are" (Berger, 2021). This phrase, in all its simplicity, leaves us, teachers involved with teaching biology, almost without air, panting. How can we hurt this rush of can-know we have nurtured for centuries over non-humans and that subtly invade our teaching acts? How can we give classes that offer other possibilities of coexistence with non-humans, other narratives? Can the Coronavirus pandemic be perceived as a crisis of coexistence? Do the deaths by COVID-19 also result from the denial (among others) of an excess of human footprints, of a significant part of a staggering "humanity" in the living body of the Earth? How can we survive in the Anthropocene?

Maria Esther Maciel: This inclusion of perspectives other than scientific ones to approach non-humans is fundamental to question the anthropocentrism and utilitarianism that contaminated the teaching of biology. It is encouraging to know that, already in the 1990s, this collection was published, making room for the emergence of a more prismatic thought in biological studies, a thought that does not shy away from recognizing what Berger said in his essay. After all, it's impossible to even know everything about everything there is. There is an illusion that feeds what you call the can-know impetus arising from human arrogance.

The pandemic has to do with how humanity has dealt with other animal species and other realms of nature. The trafficking of wild animals, the devastation of forests, capitalist greed, all this evinces the cruel and predatory coexistence of men with the natural world, causing the circulation of viruses and potent bacteria, such as those that have plagued our lives.

Humanity itself has suffered the consequences of its acts and risks becoming an endangered species as well. "Vassals that we are (some say *sapiens*)", as Adriana Lisboa writes in another poem, entitled "*outro vivo*" (another living being), we are digging, through greed and violence, our own disappearance in the "kaleidoscope of life."

Thus, we must urgently rethink – before it is too late – our relationship with nature outside the limits of anthropocentrism and specism. This is undoubtedly one of the greatest ethical and political challenges of our time.

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Notes

1 A character in South African writer J. M. Coetzee's *The Lives of Animals*. In Coetzee's book, Elizabeth Costello is an Australian writer who is a "[…] vegetarian by ethical choice and denounces the cruelty that marks the relationship between men and animals in our civilization" (Maciel, 2021, p. 50).

2 John Berger was an art critic and author of numerous novels, essays, plays, and poems who hosted the prestigious BBC television series "Ways of seeing"

in England, whose homonymous book has been recently released in Brazil by Editora Fósforo. That publishing house also published one of his most prominent books in 2021, a collection of essays entitled "Why look at animals?"

3 An American environmentalist and filmmaker who lived and died among bears in the Katmai National Park in Alaska. For more information, access: https://en.wikipedia.org/wiki/Timothy_Treadwell. Accessed on: Jan. 29, 2023.

4 From the mid-1990s onward the Faculty of Education at Universidade Federal do Rio Grande do Sul (UFRGS) established a wide field of studies – Cultural Studies in Education – which proposes a destabilization of naturalized social knowledge and practices. Its exponents in Brazil include Maria Lúcia Castagna Wortmann, Rosa Maria Hessel Silveira, Marisa Vorraber Costa, and Alfredo Veiga-Neto (all linked to UFRGS). Over the years, master's and PhD students have been trained by this first generation of researchers, "widening" the theoretical perspective across its varied graduate programs in Brazilian education. Notably, in teaching sciences and biology, Cultural Studies practitioners began to analyze a wide spectrum of representations (of bodies, nature, the environment, and health, for example) based on the understanding that they are produced discursively at schools and in a plurality of other cultural instances (cinema, newspapers, magazines, children's literature, advertisements, science museums, etc.) and impact ways of being and acting in the world. Cultural Studies in Education has been currently provoking other tensions – especially by articulating itself to literature and the arts. To better know the stories related to the field, articles, dossiers, and books were produced. On the constitution of Cultural Studies as a theoretical field, a little of its contexts is discussed in the following works: Escosteguy (2001); Costa, Silveira e Sommer' article (2003); Mattelart and Neveu's book (2004); and Restrepo's article (2015). See also the dossier organized by Wortmann, Costa, Ripoll and Bonin (2015) in the journal Educação, and the dossier organized by Wortmann, Santos and Ripoll (2019) in the Journal Educação & Realidade. On the invention of the articulation between Cultural Studies and education in Brazil, see Wortmann, Costa, and Silveira (2015); Bonin et al. (2020). To understand Cultural Studies beyond disciplinary boundaries, see the book organized by Costa (2000).

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