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The New Non-Fiction Picturebook for Children: Mending the Rift between Science and Art

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Specific to our modern world is the dualism between scientific research and the humanities, between the knowledge derived from the natural sciences, with their positive experimental approach, and the indemonstrable yet profound intuitions and insights revealed to us by literature, poetry, art, philosophy and physical and emotional engagement with the world. Official Western culture has tended to create an unbridgeable divide between these two aspects of knowing that seem mutually exclusive (Snow 1977). Today, however, a new genre of book for children, the artistic non-fiction picturebook, is bringing these two worlds together in a surprisingly refreshing way. This paper investigates how vital the blending of these two perspectives is, and why the creative, beautifully crafted, powerfully illustrated non-fiction picturebook allows an innovative and culturally crucial approach to knowledge.

Keywords: non-fiction, picturebooks, illustration, science, art, children's publishing

Many famous thinkers from a range of disciplines affirm that from a certain point in the evolution of the *Homo* species our minds became split, with the result that we modern human beings possess two ways of understanding the world: one superficial, the other profound (Otto 1996; Booker 2004; Hillman 1996; Midgley 2001; Carotenuto 2002; Harrison 1992; Steiner 2003; Bown 2006; Phillips 1999; Cioran 1993, 2004 etc.). Analytical, rational and mathematical, the first oversees the way we investigate and control phenomena. This is the approach that has led to the sciences and scientific knowledge, methodologies and logical discourse. The deeper recesses of the human mind, on the other hand, possess an ability to retain the things our brains perceive behind the real world, the echoes, inferences and implications captured beneath the surface. This part of our mind, linked to our body and senses, is the realm of intuitions

and emotions. It is what allows us to have an "imaginal" experience; it has an affinity with the poetic and is ultimately that part of us we call artistic (Hillman 1996:26).

For a very broad range of thinkers, from Kant and the Romantics through to key contemporary philosophers and psychoanalysts, it is with this deeper part of our mind that we understand fundamental truths beyond the apparent organisation of the world; it is this side of us that leads to an understanding that we are intimately part of the universe; it is at this level of our self that we can possibly feel "connected", "rooted", "belonging".

With the development of the cognitive sciences, this double and somehow opposite approach to the world has been more analytically studied and connected to the discrepant functioning of the left and right hemispheres in our brain. We do have a "bicameral mind" (Jaynes 1976) and the two hemispheres, at different stages in individual life, in different subjects, and at different times in human history, fail – or may fail – to work in an integrated manner, making our vision of, and relation to, the world unbalanced (McGilchrist 2009).

In this view, education has a very important role: it can cultivate – or not – both our ways of thinking, feeling, seeing and knowing the world and ourselves, by stimulating and communicating with both our hemispheres, or else by favouring just one. According to Iain McGilchrist, author of a monumental study on the right and left hemispheres, Western culture has progressively embraced and enhanced the instances of just one hemisphere, the left, characterised by a detached, rational, analytical, self-referential perspective leading, among other things, to a disproportionate trust in scientific knowledge and method, with what he sees as grave consequences for our relationship with the world (McGilchrist 2009).

To simplify his analysis, over the course of its history, science (possibly the best expression of the left hemisphere's perspective) has often run the risk of delivering a body of knowledge that albeit "exact" – until proof to the contrary becomes apparent – is "soulless". In scientific terms, the world is typically seen and described as an object devoid of any deep, ontological relationship with us, an inert entity to be measured, sectioned, catalogued and dominated by man. Only by once more vesting the world with a "soul", restoring its subjectivity, creativity, and autonomy, its ability to surprise us yet make us recognise that its essence will ultimately remain an ineffable ungraspable mystery, will we once again be seduced, fascinated and marvel at what surrounds us. Only then will we be able to feel involved in this world, part of it and not apart from it, as is typical of the right hemisphere's disposition: "The right hemisphere recognizes that things are never fully graspable, always imperfectly known. To these things, whatever they are, it exists in a relationship of care" writes McGilchrist (2009: 174). If this is the case, the involvement of the right hemisphere in any knowing (and teaching) process becomes crucial. The challenge, educationally speaking, is not only to make science, often viewed as a cold and sterile subject, more stimulating. There is a deeper and altogether more urgent need to make people – especially the new generations – less indifferent, less disaffected, more engaged with our living world (Mason 2005), at a time

when the planet is on the brink of imploding while we stand by indifferent as if it is not our concern.

These conclusions have been reached by philosophers, poets and humanists but also, in recent years, by scientists, and not only in the cognitive field. At the very beginning of her prize-winning book *Naming Nature: The Clash Between Instinct and Science*, biologist Carol Kaesuk Yoon, an acclaimed contributor to the *New York Times* supplement *Science Times*, writes (Yoon 2009: 4):

> […] as I was working on this book, I began to see that science was neither the best nor the only valid way to order and name the living world. Instead, I realized that the ordering and naming of life was and always had been, at its heart, something much more democratic, subversive to the dominion of science even, and much more interesting. I eventually came to see that science itself might be undermining the very thing it sought to perfect: humanity's understanding of life. Even more unexpected, I realized that the thoroughly modern, new science of taxonomy was actually helping regular folks everywhere to become more and more disconnected from living things […].

Yoon's considerations link in with those of Gregory Bateson, anthropologist, sociologist, psychologist, cyberneticist, but especially unconventional scholar, namely, that the way we view and act in the world is the result of our total reliance on an erroneous epistemological approach, a fundamental mistake that has characterised not only the sciences but the whole of Western culture and which prevents us from grasping the profound essence of reality. Like Yoon, Bateson believes that the basic epistemological mistake we have made has been to give ever less importance to the senses in our relations with the world (Bateson 1984; Yoon 2009). Descartes' legacy of "I think, therefore I am" has dominated Western culture, leading man to neglect his sensory perceptions, the only means through which we can feel truly part of the universe.

For Bateson, only an aesthetic approach can give us back an ultimate "sense of aesthetic unity", allowing us to perceive life for what it is behind appearances: a connective structure linking all aspects of the world. The aesthetic approach employs the senses and calls upon our emotions, intuition and imagination. Unlike our rational, logical deductive side that leads us to dissect reality in a super-specialised way and see it as fragmented, the senses are able to grasp the "ultimate unity" of our world as well as another essential element of vital importance to my discourse: beauty (Bateson 1984).

Our senses underpin the way we relate to the world. It is our senses that allow us to have a *rapport* that is intimate, emotional, profound and charged with affect. Any other approach – one that is not aesthetic or even, at times, ecstatic – leads to an emotional detachment that we now, after many centuries, recognise has done neither us nor the world any good since it is the root cause of our widespread indifference to the way we have laid our planet waste.

Like Bateson, psychoanalyst James Hillman is the author of an equally virulent criticism of our Western culture and mindset. Reputed as the most important successor of Jung, Hillman holds that we apprehend the "intrinsic intelligibility" of the world instinctively. He also believes that much of our Western way of thinking, rooted as it is in

"iconoclastic, anthropocentric" attitudes, and "obsessed with truth in the factual sense" should be deconstructed and replaced by a vision of the world in which the primacy of perception allows an aesthetic response to it. For Hillman, it is only by responding to things in a sensitive, sensual and empathic way that we will appreciate they have a "full soul" (Hillman 1996: 59), one that communicates with us and has significance for us. In other words, although a strictly rational being may acquire information and abstract data about the world, she is unable to experience being part of a cosmic whole since this requires a deeper form of understanding beyond the power of words or rational analysis. For this to happen, we must perceive the world not as a "given" but rather as a stimulating, surprising, evocative and elusive entity, as is the world conveyed by images/illustrations, for example (to which the right hemisphere is immediately attracted), much more than any verbal/written representation of it (fruit of the left hemisphere's workings) (McGilchrist 2009). The world should not appear to us as a clear, readily classifiable, fully knowable entity but rather as a dimension with aspects that will always escape our understanding and cause us to question, interpret and, most importantly, marvel. This, in the view of educationalist Elizabeth Cobb, author of the seminal study *The Ecology of Imagination in Childhood* (Cobb 1988), is the spontaneous state we experience in childhood. According to Cobb the sense of marvel, so common at that age, is not a mystical experience, but an aesthetic perception, one that should be enhanced and built upon when sharing knowledge with children, if we want that knowledge to be meaningful, as opposed to just useful.

The well-known anthropologist David Le Breton also holds that sensory perception should not be given a back seat in teaching and learning processes for it is only through the senses that we can "taste the world", to paraphrase the title of his memorable book *La Saveur du Monde* (Le Breton 2007).

Tasting the world means perceiving it as something that is "not outside of me" (Le Breton 2007: ix). For only if I feel an ontological connection with the world can I and will I engage. Only if I feel part of the world will I care about it. And this requires an involvement of my senses. All knowing about the world that does not affect or involve the totality of us (as in much scientific teaching[1]) presents a risk, one that is well described by the biologist Yoon (Yoon 2009: 267-268):

> [It was] in the turbulent 1980s that scientists first announced that the world was in the midst of a biodiversity crisis. Scientists had come to the shocking realization that the living world was going directly to hell in a handbasket, without any of us billions of regular folks all around the globe having had the slightest clue.

[1] Not necessarily in science itself, where intuition, insight, unpredictability, chance, emotions even, often play as important a role as the one of rationality. Many of the greatest scientists acknowledge the engagement of their whole being during their research, and for those who are not aware of it, their biographers provide evidence, as is the case of George Levine and others who have dealt with the life and work of Charles Darwin, for example, and who consider him somehow the last of the Romantics (Levine 2006). Possibly the most reputable and rigorous scientist of all times, Darwin was always emotionally absorbed in his scientific inquiries, as is evident from his writing style, full of exclamation marks, suspension dots and other devices typically used when one wants to express awe, wonder, surprise, the sensation of being in front of a mystery, as opposed to a clearly definable and intelligible world.

> We were - scientists explained - in the midst of a mass extinction of living things of our own making, one that appeared to be proceeding at a more rapid pace than ever seen in the history of life on earth. Scientists sounded the alarm. Papers were written, conferences held, speeches given, pronouncements made, all of which were met by the public with the equivalent of a vast, collective yawn. Yes, that was a shame, but really - whose problem was it? […] What could this possibly have to do with the rest of us? […]
> We have become blind to the living world - continually failing not only to notice its beauty but its very existence - and thoroughly disinterested in its disappearance.

While, as Le Breton points out, sensitive understanding lacks universality and *rigueur*, it nevertheless quietly contributes to our acquiring a taste of the world, and as such is "indispensable" (Le Breton 2007: 39). Indeed, sometimes an understanding acquired through the senses, intuition and empathy provides an awareness that is much more sophisticated and complex than the world presented through the precise lens of science. In his book *The Beast in the Nursery* (Phillips 1999), child psychoanalyst Adam Phillips, another outspoken critic of the pre-eminence in Western culture of the logical and verbal dimension, especially in education, goes to great lengths to show how we constantly strive to simplify the world (and ourselves) in the interests of security and control. Clarity, says Phillips, is the end goal of science. But clarity is always essentially defensive, always superficial. It stands as a bulwark against the complexity of the real world. Phillips warns against clarity and champions that which captures our attention and stimulates our curiosity (Phillips 1999). In other words, he champions that which speaks to our senses, since only the senses stimulate one's vital curiosity and a kind of knowing that touches us deeply. This is all the more true during childhood, when our understanding of the world still coincides with a hunger, an attraction, and a desire to know that is uniquely intense since it involves our whole body, not just our minds.

Perception in childhood is pre-verbal, synthetic and synesthetic. According to Phillips, children's appetite for life and curiosity about the world depend precisely on this kind of perception, one that will inescapably be swamped when they enter more structured, intellectualised, knowledge acquisition systems (Phillips 1999; Cobb 1998).

My research hypothesis is that, even though this has been generally true, and still is, in much formal education,[2] our culture has ultimately devised a medium that – while providing knowledge – allows a synthetic, synesthetic, implicit perception of the world to exist and to be cultivated, combining left hemisphere and right hemisphere instances, the need for analysis and pre-verbal intuition, abstract information and sensory stimulation, the desire to grasp/control reality and recognition that, in its essence, it will stay forever unfathomable. This medium is the "new generation" non-fiction picturebook, a recent, quite impressive, international children's publishing phenomenon. By this definition I refer to the carefully crafted, artistic non-fiction

[2] There are, of course, many exceptions, with kindergartens and primary schools all over Europe implementing different, sensory based, teaching/learning experiences, but they are undoubtedly exceptions to a more general trend, and they do not make Adam Phillips's concern about the direction (or the very essence) of education in the Western world less legitimate.

picturebooks that started to appear systematically throughout the West about ten to fifteen years ago (Grilli 2000). Beautiful objects as well as learning books, they represent a turning point in non-fiction. Previous decades had of course already seen several similar books: the wordless non-fiction picturebooks by Iela Mari of the 1960s are an example, as are the Non Fiction Award winners of Bologna Children's Book Fair, an award started in the 1990s. These were, however, sporadic products, rather than part of a global publishing phenomenon. The programmatic, deliberate release of a wealth of visually imposing, sumptuously illustrated non-fiction picturebooks is recent, and is the subject of this article, written alongside a university research project aiming to map and analyse the flourishing of this kind of picturebook worldwide.

In the pages of the new generation non-fiction picturebooks, we can typically find a re-presentation of the world that does not explain and confine it within assertive discourse and hard and fast definitions but allows the world to unfold before our eyes, which is precisely what a good balance between the left and right hemisphere's perspective allows, and what has been so rarely achieved, within the same medium, in the history of Western culture (McGilchrist 2009).

Learning books, or informational books (Von Merveldt 2018), and of course encyclopaedias for children compiled by authoritative groups and visually put together by the editorial staff of a publishing house rather than a single author/artist have a long and solid track record. In general, we can call them the product of the left hemisphere's approach to the world and to knowledge, with a predominance of the written text, a functional use of images, a mostly linear informational strategy (Goga 2020), a tendency to describe, explain, summarise, document, exemplify (i.e., to see and communicate the world in a rational/ analytical way), and an implicit idea of the reader as someone who must memorise and store received and pre-defined knowledge, instead of being wholly engaged in its construction (Sanders 2018). New generation non-fiction picturebooks break the mould. The recipient of massive investments by Western children's publishers, they present themselves as "open works" (Eco 1962), and they are often the most innovative, surprising, clever and physically beautiful objects to be found on bookstore shelves today. Although still classed as learning books, they are designed first and foremost to arouse the reader's senses with their large formats and powerful images chosen with great care, often executed by a famous illustrator. Their great artistic value adds a palpable allusive beauty, in the implicit yet deep-rooted conviction that it contributes to the reader's understanding of the world. They are, in fact, a tangible response to Gregory Bateson's plea to change our rigid modern thought patterns, which in his view have led to an intolerable fragmentation of the living world and to a misleading analysis of it, to be countered only by beauty (Bateson 1984: 277). For Bateson, beauty is indicative of truth. Beauty is the essence of the real world and the medium through which reality can best be understood.[3] Konrad Lorenz expresses a very similar idea when he writes: "He who has once seen the intimate beauty of nature

[3] As a scientist, Bateson reaches the same conclusion as the poet John Keats in his *Ode to a Grecian Urn,* one of the most famous and widely quoted Romantic poems.

must become either a poet or a naturalist and, if his eyes are good and his powers of observation sharp enough, he may well become both" (as quoted in Root-Bernstein 1999: 321).

Beauty does not just concern art. It has to do with the world. Beauty is of the world. It follows that to recognise and emphasise beauty in a non-fiction book is to better know the world. Scientific enquiry should never neglect beauty. "We especially need imagination in science. It is not all mathematics, not all logic, but it is somewhat beauty and poetry", writes the first woman astronomer, Maria Mitchell, in her diary in 1871 (Mitchell 2012: 321).

The aesthetic approach hailed by Bateson as the means of resonating with the world is at the heart of many recent non-fiction picturebooks for children. Appearing almost as if by common accord among publishers around the world, these learning books are still designed to present the world to their young readers. Yet they do so in a more artistic, metaphorical and unapologetically subjective way than at any time in the history of scientific learning books, privileging qualitative rather than quantitative thought and accepting the gnoseological, cognitive value of our senses and feelings. Facts and figures are inextricably meshed with the wholly personal and hence intimist interpretation of the author. For this is the essence of any vision that springs from and appeals to the senses. The world displayed in these new non-fiction picturebooks is always the world as represented and interpreted by a particular artist and rendered in his or her own personal "style". Exhibiting subjective perception together with factual representation, these picturebooks allow and indeed require the child reader to actively interpret, discover, question and explore aesthetically what she sees. Art does not assert. It evokes, alludes and invites its reader to an open-ended dialogue. Entrusted to an artist with a "vision", the illustrations of these non-fiction picturebooks act in counterpoint to the accompanying text, which can still be a traditional scientific presentation of objective verifiable facts and figures. Yet the elusive, undefined, poetic quality of the visuals imparts an aura of mystery and wonder that requires the reader to decode what she sees in her personal way. Active reader involvement – and hence sensory appreciation – becomes the predominant key to understanding and learning, both when there is an accompanying scientific text, but especially in the case of the many wordless picturebooks now being released. They seem mindful of Cobb's view that the intellect remains a sort of mechanised memory unless aided by sensory experience and deeper levels of intuition (Cobb 1998). The new generation of non-fiction picturebooks seems to have taken this on board and strives to nurture both mental dimensions. For although learning how to measure, calculate and dissect the world analytically is all-important, it is no less important to have a sense of continuity and oneness with the world around us, an understanding that springs only from a pervasive sensory awareness and insight born of allowing oneself to be overtaken by awe. The full-page illustrations, their use of colour, choice of style and composition reinstate our senses and sensory perception as instruments with which to *learn*. It is a learning mode that meshes with the logical, objective discourse proposed by the written text, allowing the

reader to grasp significance that goes beyond words – a significance that still has to do with the world, only at a deeper level. The level George Eliot alludes to, when she writes (as quoted in Beer 2000: 34):

> Suppose that the effort which has been again and again made to construct a universal language on a rational basis has at length succeeded, and that you have a language that has no uncertainty […], a potent de-odorized and non-resonant language, which effects the purpose of communication as perfectly and rapidly as algebraic signs. Your language may be a perfect medium of expression to science, but will never express life, which is a great deal more than science.

If it is true that our psychological wellbeing can only be guaranteed by ensuring a solid body-mind link (Cobb 1998), then non-fiction picturebooks are not only beautiful objects, they also do us good. For those like Cobb who believe that children should learn, think and create significance about the world they perceive, as opposed to simply memorising and registering the interpretations of a world handed down by others, then these books are an invaluable medium in the education sector. They embody an innovative educational approach that looks beyond the labels with which we officially sectorise knowledge, seeking to develop creative thought instead. *Sparks of Genius* by scientists Robert and Michèle Root-Bernstein, partners in life as in work, is a very illuminating book in this respect. After a lifetime of research and many interviews with living scientists and artists in an attempt to define what lies at the root of creativity in all fields, they conclude with a broad indictment of the Western educational system, which in their view is generally conceived in ways that end up inhibiting innovative original thought (Root-Bernstein 1999).[4] Innovative thought, they conclude, would always seem to be the result of synthetic, aesthetic and synesthetic experience; creative thinking is first and foremost intuition, emotion and the involvement of all the human senses together, in both the humanities and the sciences (Root-Bernstein 1999: 313):

> No scientist worth his or her salt just thinks about the world, he or she senses it. No true artist merely feels the world, but knows it, too. Those who wish to understand and teach science and art need to recreate that totality.

The new generation of non-fiction picturebooks currently available to teachers and children effectively bridges the two worlds of knowledge and the two dimensions of our minds that the Root-Bernsteins believe our formal education system has woefully kept separated (Root-Bernstein 1999: 317):

> We need a new kind of transdisciplinary, synthetic education. Everyone should receive early and continuing stimulation of visual, aural and other body senses. We must implement a multidisciplinary education that places the arts on an equal footing with the sciences. Arts and sciences constantly interact in very fruitful ways that are often overlooked.

[4] Again, notwithstanding the various exceptions to this, leading to laudable teaching practices aimed at fostering children's creative and original thought, I think we can agree that the one criticised by the Root-Bernsteins is, in fact, the most common trend in the Western formal education system.

And also (318):

> We need to teach how to think beyond disciplinary boundaries. Teachers should downplay tags such as "art", "music", or "science" that place science in insular boxes and focus instead on how the same material can be used flexibly in many disciplines. The object is to help everyone think simultaneously as artist and scientist.

The intuitive approach is as valid as the logic approach for understanding the world; the analytical, algebraic brain is no better than a geometrical, visual, kinaesthetic or empathic one. The imagination blossoms exponentially when experience gleaned from the senses combines with reason, when intuition goes hand in hand with the intellect, and when the knowledge acquired in one discipline opens the doors to all the rest (Root-Bernstein 1999). The new generation of non-fiction picturebooks for children does exactly that, systematically meshing information and imagination. Whatever the creative endeavour, as humans, we have (if the context does not inhibit it) a surprising ability to make connections between the sciences and the arts, between subjects allocated to the humanities and those classed as technological. It has always been thus, reaching exceptional levels during the period we not surprisingly call the Renaissance, with men such as Piero della Francesca, brilliant mathematician and amazing painter, and of course Leonardo da Vinci, fascinated by natural phenomena, the diversity of animal species, the human body, and infinite other fields of knowledge. These are only examples of the most famous "complete" men produced by the Renaissance. Today though, Western scientific culture normally avoids any form of non-logical thinking, that which cannot be verbalised, expressed in analytic, explicit, or objectively verifiable and measurable terms. As botanist Richard Mabey notes in his fascinating book *The Cabaret of Plants: Botany and the Imagination* (Mabey 2016: 15):

> Metaphor and analogy are regarded as inappropriate, even disreputable, in scientific quarters. They're liable to divert attention away from the real-life processes of plants, and to end in the ultimate heresy of the pathetic fallacy, of seeing plants as the carriers or mirrors of our emotions. But I can't see how we can hope to find a place for ourselves in earth's web of life without using the allusive power of our own language to explore plants' dialects of form and patterns, and their endless chatter of scents and signals and electrochemical semaphore. In return the plant world has repaid us with a rich source of linguistic imagery. Root, branch, flowering, fruiting – we can think more clearly about our own lives because we have taken plants into the architecture of our imaginations.

Mabey refers here to the need, indeed to how advisable it is at times, to use language that describes the world not in logical-analytical but poetic terms (using rhetorical figures, for instance) because there are things that only poetic language can fully express. These things do not concern exclusively our innermost feelings, usually considered the realm of poetry, but also things of the material world, the same world (plants, animals, landscapes, stars…) that science tries to describe and decipher. But one can even opt to go beyond the use of a poetic language and adopt, as the new generation of non-fiction picturebooks does, a completely non-verbal language to "explain", or rather disclose,

the world: a language of images, forms, colours and compositions designed with a very personal style. In other words, the language of illustration, the epitome of allusion and metaphor. If in more traditional informational books words (the stronghold of the left hemisphere) prevail and the image is thought of simply as an adornment, whose only function is to fix a meaning more readily in the mind – a meaning which could have been better stated literally – in the new non-fiction picturebooks (the expression of a rare balance between the left and right hemisphere) images are not seen as an adornment, but rather as an indispensable part of understanding. Art is not there to adorn ideas with decorous clothing: it brings new experiences and new knowledge. Artists of the new non-fiction picturebooks enable us to see something else, something that is not in the text; they actually extend the scope of our awareness; they open up new branches and channels in our apprehension of the world (see McGilchrist 2009).

In these books, science and imagination interweave, as they always should.

For human beings, knowing the world has always meant both analysis (a mental process implying detachment) and representation, that is, an attempt to make the world one's own through an act of personal creation. It is something we have always done, as the first ice-age cave paintings show. Those images were probably our ancestors' way both of acquiring information about the world and of better grasping what they saw. An attempt to understand life, their cave paintings are also a celebration of it, revealing all the emotions that come with the creative/knowing act: awe, fear, love, engagement (Mabey 2016).

This is what the new non-fiction picturebooks for young children also do: present the world in all its facets in an accurately detailed, analytical, but also artistic and creative fashion.

Yet the non-fiction picturebook that took the publishing world by storm a few years ago did not appear out of the blue. It follows in the tradition of the many splendidly illustrated scientific volumes of the 18th and 19th centuries mixing beauty and information on different aspects of the world, like the books by Alexander von Humboldt or Ernst Haeckel, for example (Wulf 2017). A worthy antecedent whose illustration style and aesthetic help explain the poetic and philosophy – and the end result – of this new wave of illustrated non-fiction books for children is *Plants of the Coast of Coromandel*, a compendium of plants published in 1820 and commissioned by the East Indian Company, the first British company to set up outposts in India at the beginning of the 18th century. No artistic whim, this botanical encyclopaedia was compiled with a view to the economic benefits to be had from many of the plants the Company discovered as it extended its economic hegemony over India. Already by the mid-18th century, authoritative botanists were engaged to conduct methodical botanical research, resulting in the production of an enormous number of detailed reports accompanied by thousands of illustrations executed by Indian artists. At a certain point, 300 of these images were chosen for publication in *Plants of the Coast of Coromandel* (a region around Madras), becoming one of the most extraordinary collections of plant illustrations ever published in Great Britain. Many believe it to be the very best book

on Indian flora ever to appear in Europe. The exceptional illustrations made the book an immediate success, which was the result of what Mabey calls its quality as a "cultural hybrid" (Mabey 2016: 243). He continues (244):

> The Company would have preferred accurate and unornamented field-guide illustrations, a crib for collectors and prospective cultivators. What they got was an exotic fusion of European precision and Mughal stylisation that revelled in the pure patterning of plants.

Although admirably detailed, the floral illustrations in the Mughal tradition were considered overly decorative by East Indian Company officials. In their eyes, the drawings lacked the no-nonsense, austere factual clarity deemed more suitable for scientific research. In addition, Western techniques like perspective – considered essential for accurate representation – were not used in India. Although attempts were made to teach European techniques to the Indian artists to ensure they met their brief, it was obviously not that easy to wipe out longstanding artistic traditions. The resultant style is a "uniquely cross-cultural" chimera. Back in Great Britain, however, there were many who fell in love with these pictures from India, seeing them as the most beautiful and exact depiction of flowers ever seen (Mabey 2016: 245).

The artistic licence that raised scientific eyebrows is what made these illustrations memorable and able to affect people deeply. More "precise" neutral images – if there is such a thing as neutrality – that gave no inkling of the artist's particular aesthetic bent, would not have had the same effect.

The lesson to be learned here is that the subjective view of the artist, shunned by science seeking objectivity above all else, is sometimes able to present the world not only as more intriguing but also as more surprisingly complex than the version offered us by scientific definitions. Subjectivity may aid, as opposed to prevent, seeing the world in a deeper, more sophisticated, possibly more illuminating and definitely more engaging way. Subjectivity is what makes the world out there become "our" world, a world that has significance for us.

Le Breton puts it this way (2007: xii, xix):

> Individuals walking in the same forest are sensitive to different things. There is the forest of the mushroom gatherer, the forest of the outdoor walker, the fugitive, the Red Indian, the hunter, the gamekeeper and the poacher; the forest of lovers and those who have got lost; there is the forest of the birdwatcher, but also the forest of animals and trees, the forest during the day and the forest at night. A thousand forests in the same forest, a thousand truths in the same unfathomable mystery that reveals itself only in fragments. The forest does not hold a single truth, but rather a multitude of perceptions depending on the perspective, expectations, and different social and cultural backgrounds. […] Knowing the world also means acknowledging the multitude of worlds concealed within the world. To achieve this, it may be necessary to abandon old patterns of intelligibility and consolidated thought patterns and venture into unexplored areas of the senses and of meaning, because perceiving always implies calling into question the significance and value of things.[5]

[5] This is the author's translation.

That new generation non-fiction picturebooks are on Le Breton's wavelength is evident not so much from the fact that there are picturebooks for each of the forests he mentions, but especially because – as he suggests – they constantly reformulate meaning and viewpoints regarding the world. Some books highlight certain elements over others in an approach that is openly partial, personal and specific. Dealing with all aspects of the world – biological, geographical, physical, chemical, astral, historical, social, anthropological, linguistic – they accurately describe, analyse and measure but also breathe new significance into what they investigate, not just on account of the clearly subjective illustration style and meditative vision of the artist but also because of their outside-the-box approach to their subject matter in defiance of standard categorisation into watertight compartments. They adopt many different, often unusual, and even disconcerting ways of portraying our universe. Life on Earth can be divided in an infinite number of ways: by colour, unusual shape, or strange habits, for example. Some picturebooks classify animals according to the particular conformation of their mouths, tails or eyes and visual acuity. Others group living creatures according to the way they sleep, mate, or bathe. Similarly, plants can be presented not on the basis of the botanical family to which they belong, but, to give an example, as having been the cause of wars between countries or continents because of the economic benefits at stake. In this way botany, history and politics are woven into the same overarching book. Many recent picturebooks take a subject – the egg, or the horse, for example – and enumerate their species, breed, types and everyday usage, but also explore the symbolic meaning they have had in human history, and their recurrence as metaphors in literature, poetry or myth. Compared to the new generation picturebook, the traditional formal-education approach to most scientific concepts appears reductive. Time, for example, has been given refreshingly new and sophisticated treatment with a series of thought-provoking double "before and after" images on a range of different subjects such as the changing seasons, the wasting away of things, the transformations of landscapes, the consequences of our actions. Similarly, the concept of space is creatively handled, double-page spreads providing surprising views of the "inside" and "outside" of unexpected places or containers. The concept of "above" and "below" is explored considering not only everyday environments familiar to children, but also unfathomable depths and sidereal expanses. By the same token, topics like linguistics and anthropology are dealt with, depicting children in a wide range of everyday situations, all imaginatively illustrated to help readers understand the vocabulary associated with things like the food, customs and rituals of completely different – and hence sometimes untranslatable – cultures. These are just some of the infinite number of examples of how the recent wave of non-fiction picturebooks for children tackles their science-teaching briefs. This article has deliberately chosen not to give specific examples of the new trend, but rather to highlight the recent phenomenon and its theoretical, philosophical and pedagogical frame. It is just a step in the direction of a much needed – and eventually more specific – critical approach to a new medium that has only just started to be analysed at the academic level, notwithstanding its explosion as an international publishing phenomenon. A

phenomenon whose ultimate signification is that not only are visions other than strictly scientific ones both legitimate and able to provide information about our universe, but other forms of discourse *within* science are also possible beyond the word, the formula and analytical logic, forms that can be enlightening in their own way. We only have to open any new non-fiction picturebook to realise this. Better still, we should explore the full range, for it is especially as a corpus of new picturebooks that they have the potential to be worthy additions – if not alternatives – to compulsory school texts. Together, they cover the widest range of interests and present the kind of multiple, non-compartmentalised, and interwoven knowledge that the most important educational reformers, from Pestalozzi, Froebel, and Montessori, have always hoped for.

The divide between the sciences and the humanities and the completely different way of looking at and describing our world is consistently bridged by recent non-fiction picturebooks for children published throughout the West. Today, what seemed an irreconcilable oxymoron of our official culture is woven together in a representation of reality that finally can be instructive but also aesthetic and therefore in part implicit, elusive, a source of fascination for readers. Books like these may help the new generations have a more "balanced" relationship with their world, one that will engage their attention, curiosity, and marvel, creating not only understanding, but also a sense of belonging, a sentiment that apparently is not triggered unless our senses are involved and our aesthetic awareness and sense of beauty aroused: in other words, unless we are emotionally and imaginatively engaged the very moment we acquire information and hard facts.

Whether by design or by chance, yet with surprising consistency across the publishing board, non-fiction picturebooks today are committed to doing just that: presenting scientific facts concerning our world in a poetic, artistic, unpredictable and original way. The world is no longer a mere *object* of study but a *subject* – Bateson would call it a "creature" – of boundless fascination one never stops wanting to explore. Devising a medium that appeals to the left hemisphere's need for precision and clarity but is also in tune with the right hemisphere's assumption that the nature of things is implicit and hidden because the world is more like a living thing, a connected whole always changing and evolving; a medium that uses denotative language but is grounded in the belief that creativity is needed as an unveiling process (denotative language enabling not communication itself, but *a special kind* of communication, not thinking itself, but *a special kind* of thinking, which, alone, is not necessarily true to the nature of things (McGilchrist 2009)), is one of the most remarkable novelties in recent children's publishing. Wittgenstein thought that "scientific accounts of the world leave us with the distinct impression that everything has been accounted for; they give us the illusion of explaining the world that we might do better to wonder at" (as quoted in McGilchrist 2009: 178). New generation non-fiction picturebooks make both experiences simultaneously possible for the reader. They promote a special sort of seeing, in which both distance and empathy are crucial.

Thanks to a providential blend of the scientific and the aesthetic, they not only provide young readers with a more sophisticated and multi-layered knowledge. They also help create an engagement with our world that will be crucial to the future of our planet.

References

Bateson, Gregory. 1977. *Verso un'ecologia della mente* [*Steps to an Ecology of Mind*]. Milano: Adelphi.

Bateson, Gregory. 1984. *Mente e Natura: Un'unità necessaria* [*Mind and Nature: A Necessary Unity*]. Milano: Adelphi.

Beer, Gillian. 2000. *Darwin's Plots*. Cambridge: Cambridge University Press.

Booker, Christopher. 2004. *The Seven Basic Plots: Why We Tell Stories*. New York: Continuum.

Carotenuto. 2002. *Il fascino discrete dell'orrore. Psicologia dell'arte e della letteratura fantastica* [Psychology of art and of fantastic literature]. Milano: Bompiani.

Changeaux, Jean-Pierre. 2017. *Neuroscienze della bellezza* [Neurosciences of Beauty]. Roma: Carocci.

Cioran, Emile M. 1993. *La caduta nel tempo* [*The Fall into Time*]. Milano: Adelphi.

Cioran, Emile M. 2004. *Un apolide metafisico* [Collection of unpublished-before interviews]. Milano: Adelphi.

Cobb, Edith. 1998. *The Ecology of Imagination in Childhood*. London: Routledge and Kegan Paul.

Eco, Umberto. 1962. *Opera aperta* [*Open Work*]. Milano: Bompiani.

Goga, Nina. 2020. "Verbal and visual informational strategies in nonfiction books awarded and mentioned by the Bologna Ragazzi Award 2009-2019", in Grilli Giorgia (ed.). *Non-fiction Picturebooks: Sharing Knowledge as an Aesthetic Experience*. Pisa: ETS.

Grilli, Giorgia, ed. 2020. *Non-Fiction Picturebooks: Sharing Knowledge as an Aesthetic Experience*. Pisa: ETS.

Harrison, Robert Pogue. 1992. *Foreste. L'ombra della civiltà* [*Forests. The Shadow of Civilization*]. Milano: Garzanti.

Hillman, James. 1996. *Oltre l'umanismo* [Beyond Humanism]. Bergamo: Moretti & Vitali Editori.

Jaynes, Julian. 1976. *The Origin of Consciousness in the Breakdown of the Bicameral Mind*. New York: Houghton Mifflin

Le Breton, David. 2007. *Il sapore del mondo: Un'antropologia dei sensi* [*Sensing the World*]. Milano: Raffaello Cortina Editore.

Levine, George. 2006. *Darwin Loves You: Natural Selection and the Re-Enchantment of the World*. Princeton: Princeton University Press.

Mabey, Richard. 2016. *Il più grande spettacolo del mondo. Botanica e immaginazione* [*The Cabaret of Plants: Forty Thousand Years of Plant Life and the Human Imagination*]. Milano: Ponte alle grazie.

Mason, Jim. 2005. *Un Unnatural Order: The Roots of Our Destruction of Nature*. New York: Lantern Books.

McGilchrist, Iain. 2009. *The Master and his Emissary. The Divided Brain and the Making of the Western World*. New Haven and London: Yale University Press.

Midgley, Mary. 2001. *Science and Poetry*. London and New York: Routledge.

Mitchell, Maria. 2012. *Life, Letters, and Journals 1896*. New York: Forgotten Books.

Otto, F. Walter. 1996. *Il volto degli dei. Legge, Archetipo e Mito* [Law, Archetype and Myth]. Roma: Fazi.

Phillips, Adam. 1998. *The Beast in the Nursery: On Curiosity and Other Appetites*. London: Faber and Faber.

Root-Bernstein, Robert and Michèle. 1999. *Sparks of Genius*. New York: Houghton Mifflin Company.

Sanders, Joe Sutliff. 2018. *Literature of Questions. Nonfiction for the Critical Child.* Minneapolis: University of Minnesota Press

Snow, Charles Percy. 1977. *Le due culture* [*The Two Cultures and the Scientific Revolution*]. Milano: Feltrinelli.

Steiner, George. 2003. *Grammatiche della creazione* [*Grammars of Creation*]. Milano: Garzanti.

Von Merveldt, Nikola. 2018. "Informational picturebooks" in Kummerling-Meibauer (ed). *The Routledge Companion to Picturebooks*. London: Routledge

Wulf, Andrea. 2017. *L'invenzione della natura* [*The Invention of Nature*]. Milano: Luiss.

Yoon, Carol Kaesuk. 2009. *Naming Nature: The Clash Between Instinct and Science*. New York: W.W. Norton & Co.

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Nove nefikcionalne dječje slikovnice: zatvaranje rascjepa između znanosti i umjetnosti

Za naše je moderno doba karakterističan dualizam između znanstvenoga istraživanja i humanističkih znanosti, između spoznaja prirodnih znanosti, s njihovim pozitivno eksperimentalnim pristupom, i neprovjerljivih pa ipak dubokih intuicija i uvida koje nam otkrivaju književnost, poezija, umjetnost, filozofija te fizičko i emocionalno bavljenje svijetom. Službena zapadna kultura nastoji stvoriti nepremostiv jaz između tih dvaju aspekata spoznavanja koji se čine uzajamno isključivima (Snow 1977). Danas, međutim, nova vrsta dječje knjige, umjetnička nefikcionalna slikovnica, povezuje ta dva svijeta na iznenađujuće svjež način. U radu se istražuje koliko je vitalno stapanje tih dviju perspektiva i zašto kreativna, lijepo načinjena nefikcionalna slikovnica s moćnom vizualnošću omogućuje inovativan i kulturno presudan pristup znanju.

Ključne riječi: nefikcionalnost, slikovnica, ilustracija, znanost, umjetnost, nakladništvo dječjih knjiga