

# The Pedagogy of Nature according to Maria Montessori<sup>1</sup>

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## Abstract

In this paper, we examine the multiple concepts of nature expressed in the writings of Maria Montessori, with respect to children's relationship with nature and educational practices. We analyze the multiple meanings that Montessori herself attributed to the term "nature", going on to explore the place of nature in her child pedagogy, as well as her thoughts on caring for nature, keeping gardens and animals, and nature as the ideal setting for sensory education. We ultimately draw together a Montessorian Pedagogy of Nature that underscores the importance of child-nature interaction during the early stages of development. The study was conducted under the PRIN 2019-2021 program, as part of a leading research national project entitled "Maria Montessori from the past to the present".

Ci proponiamo con il presente studio di esaminare i molteplici concetti di Natura espressi negli scritti di Maria Montessori, rispetto al rapporto fra il bambino, la natura e le buone pratiche in contesto scolastico. Tale molteplicità sarà rintracciata e discussa nella seconda parte del lavoro. Saranno dunque analizzati la natura del bambino, i temi della cura di piante e animali e la creazione di campi, orti e giardini. La natura negli scritti montessoriani si presenta anche come condizione ideale per l'educazione dei sensi e dello spirito scientifico. Deriviamo nella parte finale le linee di una Pedagogia della Natura secondo la Montessori, da applicare fin dalle prime fasi dello sviluppo del bambino. La presente ricerca è condotta nell'ambito del PRIN 2019-2021, come rilevante progetto di ricerca nazionale, con il titolo di "Maria Montessori dal passato al presente".

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<sup>1</sup> This paper is a summary of the authors' joint research and writing activities. For purely formal purposes, Fabrizio Bertolino may be viewed as the author of Sections 2, 3 (Subsections 3.3) and 4, and Manuela Filippa as the author of Sections 3 (Subsections 3.1, 3.2, 3.4, 3.5, 3.6, 3.7) and 5.

**Keywords:** Maria Montessori; nature; childhood; pedagogy; education

**Parole chiave:** Maria Montessori; natura; infanzia; pedagogia; educazione

## 1. Introduction

*I understand the great English poet Wordsworth, who, in love with Nature, began to hear the mysterious voices of her colours and of her silences and asked from her the secret of all life. At last, as in a vision, the revelation came to him: the secret of all Nature dwells in the heart of a little child (Montessori, 1909/2000, p. 683).*

In this citation, Maria Montessori summed up what she viewed to be the key aspects of children's relationship with nature. This provides us with a valid starting point for exploring the multiple meanings that she attributed to the term "nature" in her writings. Of central importance to her was the close tie between the secret of life and nature. For hundreds of years, man has firmly positioned himself as "maître et possesseur de la nature" (Descartes, 1840, p. 64), in the eternal struggle between nature and *techne*, understood as the scientific approach to solving problems and interpreting human existence. As Robert Louvin (2000) outlined in a paper on the evolution of the relationship between nature and law, throughout the history of Western thought, the pendulum has continuously swung back and forth between the unlimited power of humankind over nature and the need to acknowledge that nature has laws of its own.

Montessori took a clear stance on this issue, viewing human beings as inseparable from nature, and indeed, nature as key to understanding humankind. In addition, she saw the young child, rather than the human person in general, as playing a particularly important role in revealing nature's secrets to us. In light of this background, we propose to read Montessori's pedagogy of nature as an interpretative key to her overall vision of education for children.

## 2. Montessori: nature in education

The importance that Maria Montessori attributed to the relationship between nature and child development was clear from her earliest publication, *Il metodo della Pedagogia scientifica applicato nelle Case dei Bambini* (1909). Here, she devoted an entire chapter to "*La natura nella educazione*" [Nature in Education], thus immediately joining the eternal debate over nature and nurture<sup>1</sup>.

Referencing Rousseau, she explicitly put forward the view that nature alone cannot sufficiently educate the human person to take part in society and that there is an inevitable clash between natural and social existence. The example she used was the Wild Boy of Aveyron, who had been assimilated by nature, becoming part of it and delighting in it; to the extent that «rains, snow, tempests, boundless space, had been his sources of entertainment, his companions, his love» (Montessori, 1909/2000, p. 298).

This suggests that the main aim of education is to initiate children into social life and social rules. Yet – Montessori argued – nature cannot be simply set aside or erased in service of a social life that requires one to walk rather than to run and to moderate one's tone of voice rather than to shout. The concepts of educating in

harmony with nature and through nature took firm hold within Montessori's pedagogical perspective, and she developed and expanded them across her entire body of writings.

In order to thoroughly explore her multi-faceted views on nature, we conduct an in-depth analysis of Montessori's own words, exploring seven of her published works from a diachronic perspective: *L'autoeducazione nelle scuole elementari* (1916), *La scoperta del bambino* (1948/1950a), *Il bambino in famiglia*. (1923/1956), *Il segreto dell'infanzia* (1936/1950b), *Educazione per un mondo nuovo* (1947/1970a), *Come educare il potenziale umano* (1947/1970b), *La mente del bambino: mente assorbente* (1949/1952)<sup>ii</sup>.

Montessori emphasized again and again that children's relationship with nature is complex and much broader than it seems: she did not see nature-based education as a form of moral education, nor as educating the child to experience beauty and wonder, and neither could it be reduced to school gardens. She wished children to have the opportunity to "live naturally" and not just be guided to learn about nature. By itself, the purely cognitive discovery of nature would not allow children to "live naturally"; rather, they needed to be freed from the constraints imposed on them by artificial, urban lifestyles. And frequently even the timid efforts of physical education programs – which ensured exposure to fresh air, sunshine, and wind for children and young people – were not enough, because the big issue, according to Montessori, was that «we have all made ourselves prisoners voluntarily, and have finished up by loving our prison and transferring our children to it» (Montessori, 1950a/2000, p. 307).

The prison of artificiality, of civilization itself, has stifled our souls and those of our children, amongst other reasons, because the more "invasive" aspects of nature, such as rain, wind, and sunshine, are frightening to most people.

Free nature, to use Montessori's words, bears the potential to draw out children's true strength: if they are not bored, even young children can walk for miles. At the same time, as we know, Montessori also reminded the educator to patiently watch over children while they spontaneously observe nature, to spend time with them while they look at a flower, a blade of grass, or a poor dead bird, because appreciation of nature, like any other ability, only develops through exercise.

In light of this introduction to Maria Montessori's broad reasons for concerning herself with nature, we now examine in detail the multiple meanings she attributed to nature in her writings.

### 3. The multiple concepts of Nature expressed in Montessori's writings

In this paper, we set out to analyze the multiple concepts of *nature* expressed in Montessori's main writings in relation to children's interaction with nature. First, the term "nature" appears over a thousand times in Montessori's key works and is often used to characterize the nature of the child (3.1) as a set of instincts, traits, individual sensitivities, and dispositions that guide development. We do not examine this meaning in depth, but rather concentrate on wild *nature* and its basic elements such as air, water, sun, rain or wind (3.2). We also look at *nature* when it is "domesticated" (3.3), such as in school gardens where children are invited to take care of plants and animals, and (3.4) *nature* as an ideal place and setting for fostering and enriching children's sensory experience. We touch on *nature* in relation to observation and scientific classification (3.5) and how these skills

can help children to develop a more mindful relationship with the natural environment. In addition, the concept of *nature* is often used in Montessori's texts (3.6) as a metaphor for the educational process in children and adolescents: there is variety in *nature* as in the human spirit, and the silence of *nature* is a metaphor for the human person's need for silence, while the concepts of growth, patience, transformation, and movement help us to understand the developmental process in both *nature* and human beings. Finally, we discuss the substantial overlap between Montessori's broad understanding of the meaning of *nature* and Cosmic Education, as reflected in her later writings. Indeed, her last thoughts on *nature* appear to invoke and weave together all the previous meanings, offering an overarching narrative of human beings and *nature*.

### 3.1 *The nature of the child*

Montessori often used the term “nature” to define the nature of the child or children's natural character. In this context, she appeared to employ the word as a synonym of spontaneity, and at times, as a synonym of instinct. The notion that children should be able to freely manifest their natural character at school was Montessori's rationale for providing a setting suited to the expression of their leanings, traits, and spontaneous behaviours. She contrasted the child's nature with the artificiality of traditional teaching methods, which focus on getting children to conform to shared social rules. She also challenged – and undermined – the notion that educating means instructing and transmitting knowledge. In her work *The Discovery of the Child*, in the chapter on freedom of development and the developmental environment, she repeatedly stated the importance of offering conditions that enable children to express their natural traits (Montessori, 1950a). The idea that children possess a nature that guides their development underpinned Montessori's insistence on observing their spontaneous behaviours. To understand children, we must observe them under conditions of freedom, as does the entomologist when observing insects. For example, in relation to studying attention in children (Montessori, 1916), in terms of their capacity to spend a protracted amount of time on playing a game or repeating an exercise, Montessori emphasized that experimental educational science and psychology should be based on “naturalistic” observation, the only condition under which the nature of the child can freely make itself known.

Finally, nature guides and determines the timing and stages of development in children – who also grow naturally – endowing them with sensitive periods in which they are naturally more inclined and more motivated to acquire certain kinds of learning. This is particularly true in the early years of a child's life, starting at birth, and this is why, from a universal education perspective, all children, irrespective of their culture or social class, have the right to an educational method that follows «human nature as it unfolds» (Montessori, 1952, p. 77).

We will not dwell any further on this use of the term “nature” by Maria Montessori, but it is important to at least acknowledge it, given how frequently she drew on it throughout her writings. We may conclude this section by briefly summarizing the key points in Montessori's perspective on the child-nature relationship: first, she pointed out the need to observe children's nature (in terms of their orientations, instincts, or tendencies); second, when children live a life that is detached from nature their development will be incomplete; and finally, educating means respecting the development schedule established by nature.

We will explore this last point in detail by analyzing nature both as a metaphor and as a guide for pedagogy.

### ***3.2 Living in nature: fresh air, sun, and wind***

*The idea, however, of living in Nature is the most recent acquisition in education. Indeed the child needs to live naturally and not only to know Nature. The most important fact really is the liberation of the child, if possible, from the bonds which isolate him in the artificial life created by living in cities (Montessori 1950a/2000, p. 304).*

Among the civil rights of twentieth-century children, Montessori counted the right to freedom as the first and most basic principle that should guide educational action by adults. A freedom that she saw as firstly physical and bodily, based in part on her thinking about hygiene. Hygiene was understood at that time as all practices aimed at improving children's health and quality of life; among these, Montessori viewed time spent outdoors and exposure to the elements and natural events – such as air, wind, water, and rain – as key to natural living. From her perspective, living according to nature and in freedom were two sides of the same coin where children were concerned. In the society of her time – and how much more would this be true today! – Montessori observed that children lived far removed from nature and rarely experienced it. They were subject to constraints that imposed an artificial way of life – and alas this has never been as true as it is in our contemporary era! – and isolated them within the confines of their homes. This situation prompted Montessori to reflect on bodily hygiene practices, which were then especially targeted at weaker children, affected by tuberculosis and rickets. Why, she asked herself, do we not free the bodies, the little feet, and the hands of all small children and allow them greater contact with the air, sun, and wind? Why do we not free them from the excessive restrictions of communal living, which we have all accepted and which have turned us into voluntary – and often very willing – prisoners?

In the confusion induced by this imprisonment, Montessori maintained, adults had come to accept even the most absurd conventions, in the name of what were assumed to be the rules of civilized existence. If to cure diseases such as rickets and tuberculosis, Montessori pondered, children were taken outdoors in the fresh air and sunshine, why not do the same with every child? Why assume that it would not benefit other children to be exposed to the sun, the air, and atmospheric agents in general?

Montessori could only find one explanation: that people had freely submitted themselves to their state of imprisonment.

Unfortunately, like our counterparts of a century ago, we continue to live in fear of fresh air, sunshine, overnight frost, and rain. Montessori's advice was very simple: children need to experience nature in its free state, such as the beach instead of sand in a jar, frost under their bare feet rather than always having their feet confined to shoes, and the opportunity to run in wide-open spaces without restrictive clothing.

She called loudly for children to be allowed to indulge their appreciation of nature, and to directly experience living immersed in nature, in order to repair the damage that an overly artificial environment might already have caused.

The other key message that we may glean from Montessori's writings, as exemplified in a passage on the Moral Question (Montessori, 1916), is that adults find it difficult to understand children's desire to lie on the ground, continuously move around, and touch everything they encounter regardless of whether it is wet, muddy, or otherwise. In other words, the desire to experience nature.

This gives rise to an ongoing struggle, because adults would prefer children to be more stationary, more careful not to get their clothes dirty, and less careless about sticking their hands in their mouth or touching unclean objects. Montessori expressed the hope that this struggle between adult and child might be brought to a peaceful conclusion by adults becoming more accepting and supportive of children, accompanying them throughout their natural development process and watching over their growth into fully-fledged human beings.

Experiencing nature thus emerges as a powerful theme in Montessori's writings, as the ideal condition under which to observe children's inclinations and interests, and as the perfect setting for learning and developing the use of the five senses.

### ***3.3 In the flower garden, vegetable patch, or field: cultivated nature***

A comprehensive analysis of the primary literature suggests that Montessori rejected the artificial distinction between gardens and vegetable gardens, along with the related notion that the former is cultivated for the sake of beauty and latter for its usefulness<sup>iii</sup>. It is children who bring to light the potential and limitations of each of these settings. While on the one hand, children love to admire flowers and gaze at their colourful blossoms (Montessori, 1950a), it is planting seeds but especially harvesting crops that really excites them and arouses their "practical interest". Looking more closely at this concept across Montessori's writings, it appears that gardens – above and beyond the therapeutic and hygienic aims of outdoor schools, the vocational training aims of the school garden movement, or the religious aims of the gardens set up by Lucy Latter in England – were the setting that she viewed as offering children the opportunity to experience *life in the fields* and *work in the countryside*<sup>iv</sup>. Major tasks, such as harvesting corn or grapes, and helpful tasks, such as picking up almonds that have fallen from the tree or keeping hens, as well as varied tasks, and demanding tasks, were the ideal means of both satisfying children's desires and needs, and introducing them to the agricultural practices that would later be so important for the "Erdkinder" (Montessori, 1939).

Thus, a plot of the right size would be crucial – according to Montessori – to the success of what she called a *garden of our own*: too large an area would not be fully utilized and would contain too many unknown elements, more than the memory of a small child could take in, while too small an area would not fulfil all of the child's needs. Thus, Montessori prompts us to reflect on limits as a criterion, but above all on the criterion of offering a setting that is *tailor-made*: in other words, one that is proportional to the children's movements, and to their bodily size and characteristics<sup>v</sup>.

For Montessori, working with plants and animals was crucial to developing observation skills, respect for nature, and the appreciation that nature rewards our efforts with generosity. Such habits of observation carry lifelong benefits for children.

Finally, as Montessori saw it, taking scrupulous care of other living things not only bears moral implications, but also satisfies one of the primary instincts of the childish soul, that of living in nature and according to nature. Raising animals and growing plants provides an opportunity to foster children's sense of responsibility and their awareness of their own actions, as well as introducing them to an alternative perspective to that of the here and now: each child will need to know how to behave appropriately towards the living things in his or her care, how to foresee and provide for their needs, have respect for them, and wait patiently for nature to reward these efforts.

### ***3.4 Nature as the ideal context for supporting sensory experience***

Montessori tells us that natural environments are the ideal setting for children to exercise and refine their sensory, visual, tactile, olfactory, gustatory, auditory, and motor skills.

In open-air natural settings, they can unleash their muscular energy and take pleasure in exercising their bodies and senses.

In "The Discovery of the Child", in the paragraph on smell, Montessori observed that grassy areas, whether landscaped or left to grow wild, can offer a privileged place for children to explore and practice using their sense of smell. In her writings, she does not merely understand smell as a sense to be developed in terms of learning to identify different scents, but rather as an organ that children may use to actively learn about their environment. Indeed, while her older pupils were reflecting on the relationship between taste and smell in the school canteens, «the small children were earnestly going about looking for the scents that nature had doled out to the little shoots of grass in the fields» (Montessori, 1950a/2000, p. 383).

Given that nature is a setting that offers infinite variety, when children use their vision to study its forms, just as when they exercise their sense of smell or hearing, they have the opportunity to immerse themselves in the widest imaginable range of sensory stimuli. In contrast with the artificial – and highly rationalized – classroom setting, observing nature allows children to engage with a vast number of phenomena – including shapes, sounds, or smells – and to practice making distinctions. Furthermore, nature not only offers children variety, but also the opportunity to observe variation. This concept, which is foundational in the natural sciences, implies awareness of the fact that no living thing is identical to another, not even to another individual of the same species. And just as flowers, snowflakes, and leaves are all the same but yet unique, so it is with human beings.

The natural environment thus provides children with an ideal laboratory in which to experiment with using, not just their individual senses, but also more complex functions, involving for example the use of imagination and artistic abilities. By directly observing nature, Montessori argued, it is possible to nourish the aesthetic imagination. In a passage on the theme of Drawing (Montessori, 1916, p. 408), she stressed that both with real-life subjects and artworks on the theme of nature such as Haeckel's famous albums, children can exercise their aesthetic imagination by observing and reproducing graphically – and via bodily movement and sounds, we might add – the artistic forms to be found in nature.



### **3.5 Botany, ecology, ethology, and science**

*The teacher's foresight ought to be as exact as that of the scientist and as spiritual as that of the saint. Formation in science and formation in holiness should together shape a new soul, because the teacher's attitude should be simultaneously positive, scientific, and spiritual* (Montessori, 1916, p. 102).

The key theme of the child-scientist is a constant across Montessori's entire work and one that she developed specifically in relation to the study of *nature*. We do not intend to examine on Montessori's teachings about science education in natural settings, a topic that was very close to her heart and on which she frequently wrote, but rather to reflect, more generally, on the tendency of the child to approach *nature* in a scientific manner. The scientist, according to Montessori, just like the teacher and the child, must approach the study of *nature* with fascination and total dedication, to the point of forgetting about himself, but above all he should focus his inquiry on the spirit of *nature*, and not just on its mechanisms. The scientist therefore is the interpreter of the spirit of nature, and of the manifestation of natural phenomena, which are revealed to him alone.

Training teachers to be competent in observing nature, and to vibrantly and vigilantly scrutinize the metamorphoses of living things, must not be confined to the study of animals and plants, because the teacher's ultimate mission is to be knowledgeable about human beings. Hence, while teachers who initiate their children into the mysteries of natural science must possess and be able to transmit the capacity to observe living things from a positive science perspective, they must also have the ability to grasp the spiritual dimension that is present in living nature. And this leads us to another of the meanings held by *nature* in Montessori's work: nature as a metaphor for the human being.

### **3.6 The metaphor of nature in the writings of Maria Montessori**

#### **3.6.1 Nature as a metaphor for education**

«Not only the sensory material, but the entire setting is set up so as to attract him, just as in nature the coloured petals attract insects to suck to the nectar concealed inside them» (Montessori, 1950a/2000, p. 324). The image of a seed growing in the soil has ancient origins as a metaphor for growth and education. In our culture, this image is often associated with Biblical scenes, with the seed corresponding to the child, who, thanks to a combination of the quality of the soil (environment, nature) and the skill of the farmer (the culture, the teacher), can develop into a fully-grown plant. But Montessori set out to transcend even this metaphor, stressing that nature, as well as stimulating and guiding the development of the child, itself «calls the child to a greater awareness of the world» (Montessori, 1950a/2000, p. 616).

### *3.6.2 Movement in nature, movement in human beings*

Nature also becomes a metaphor, and a model, for motor education, because – as Montessori reminded us – while nature endows animals with perfect movement, which is thus largely a matter of instinct for them, the same cannot be said of the child (Montessori, 1970). Children can only emulate the tiger's or the squirrel's grace by means of repeated practice, especially via exercises in coordination, which gradually permit them to acquire the harmony of movement that may be observed in nature. The child who observes nature, and especially animals, will learn to imitate their more basic motor acts, such as jumping, springing, hiding, and running.

We might build on Montessori's reflections by adding that plants too, whether swaying in the wind or immobile, can teach us something about movement: the corn bends in the breeze, but without interrupting its movement, which extends from its roots, securely anchored to the ground, to its uppermost tip, showing itself to be flexible but resistant. In the same way, when a storm is raging, the leaves of a tree will vibrate in the wind, while its trunk appears to remain motionless. Even the rocking motion of falling autumn leaves can offer a model to be imitated: their light and sinuous descent suggests the experience of weightlessness, as though one's body, borne by the air, were floating slowly to the ground.

### *3.6.3 The functioning of nature as a metaphor of human society: the organism*

In her treatise on Embryology (Montessori, 1952), the science that investigates «the creative process, the way in which a body that did not exist comes to form, ultimately in order to join the world of the living» (Montessori, 1952, p. 37), Montessori outlined the development of the embryo, in accordance with contemporary knowledge, and used nature as a metaphor for social organization. The functioning and development of the embryo as dictated by the laws of nature – in her view – served to explain the reasons for specialization and change in human society. Just as in nature, from the very beginning of life, all the bodily organs communicate with one another and all are necessary for the correct functioning of the entire system, so too do individuals operate within a society. Montessori further argued that the development of living organisms in accordance with the laws of nature is not only an effective metaphor for the development of society, but also for children's psychic development which, like their physical growth, «seems to follow nature's same creative plan» (Montessori, 1952, p. 52).

## **3.7 Nature and cosmic education**

In the preceding paragraphs, we have sketched a complex picture of the human person's relationship with nature: one that is far removed from any mechanistic notion that the parts of the universe may be conceptualized and studied as separate and constitutively different to one another.

On the contrary, Montessori's writings yield what Ceruti and Lazzarini (2020) have defined as “a new cosmic consciousness”, or an awareness of the fact that everything is connected to everything else, while yet retaining its own unique place in the universe. An awareness, we might say, that there is a profound likeness – which informed all the metaphors we have discussed in the earlier sections – between the elements making up nature, the laws governing the development of the human person, and the universal laws of nature. To put this in

Montessori's own words, «everything is closely connected on this planet and each detail is of interest because it is connected with the others» (Montessori, 1949, p. 60).

Given Montessori's starting premise that everything in the universe is closely connected, including the human being and by extension the child, it follows that hers was an essentially “relational, systemic, developmental” perspective (Ceruti & Lazzarini, 2020). The child discovered by Montessori is not only part of nature, but his or her very development is regulated and guided by nature's own rules. Hence, this brief mention of cosmic education – a systemic perspective that Montessori was to develop more fully in her work *Come educare il potenziale umano* (1970) – brings us back full circle to our opening citation and Montessori's description of the “nature of the child”.

#### 4. Key Montessorian concepts for a Pedagogy of Nature

As we have seen, Maria Montessori's reflections about the educational potential of the encounter between the child and nature have fundamentally been located, since 1909, in the book chapter *Nature in Education*<sup>vi</sup>. However, patient examination of her subsequent writings brings to light the extent to which her thinking matured under the influence of her later studies, encounters, experience, and exposure to other cultures, leading her to redefine and extend the roles and meanings she attributed to “nature”. Thus, while Montessori never systematically presented a pedagogy of nature as such, her perspective on nature may be reconstructed by meticulously analysing her many writings. Throughout her work, nature surfaces at times in the form of gardening, at others in relation to sensoriality, and – frequently – as a metaphor. Montessori's overarching standpoint was that nature is part of the human being and the human being part of nature, and that the child is the main source of revelation of the secrets of nature and life. She concludes that it is impossible to speak about education without contemplating children's relationship with nature.

Now that the pervasiveness, almost omnipresence, of nature in Maria Montessori's pedagogy has been made clear, let us next attempt to systematically present her suggestions (although exhortations might be an even more appropriate term) on the theme, which we view as foundational to defining a pedagogy of nature.

Indeed, in light of recent findings about the benefits of outdoor lifestyles and the learning experiences that *nature* can afford, a national and international movement has embraced the challenge of redefining and rediscovering the theories, methods, and practices of outdoor learning and education. The legacy of Maria Montessori offers a solid foundation for this effort, as well as informing contemporary avenues of inquiry, a first core group of which we now preliminarily identify:

1. Nature and the child's development:
  - The child is part of his/her environment;
  - It is crucial that the development of a child's personality should follow his/her nature;
  - The child needs to develop his/her own way of coming into contact with nature;
  - The child grows and develops by adopting the spirit of the scientist;
2. The child's nature:
  - It is important to observe the nature of the child (orientations, instincts, tendency);

- The child who remains distant from his/her nature is not complete;
- Educating means respecting nature's rules of development;
- 3. Working in nature:
  - It is the nature of a child to work in nature (this dual use of the term "nature" is likely intentional);
  - Working in nature requires order and regularity;
- 4. The concept of nature and caring for the environment:
  - Early contact with nature is irreplaceable;
  - Natural and artificial environments need to follow the same rules: harmony, order, ecc.;
  - Children have a need to take care of both, because they love their environment;
  - Caring for the environment (e.g., by growing plants) means enhancing children's consciousness;
- 5. Nature as a metaphor for children's growth and development:
  - Nature is ordered and it follows rules and instincts;
  - Nature is beauty and it prompts positive reactions;
  - The metaphor of seeds: the child's intelligence is a fertile field in which seeds may be sown;
- 6. Viewing nature through the lens of scientific observation:
  - Botany, geography, zoology offer basic notions of how life works, thus forming more mindful adults;
  - Ecology is a special science informing the solution of environmental problems.

## 5. Research prospects

This study is part of a broader national research project entitled *Maria Montessori from the past to the present. Reception and implementation of her educational method in Italy on the 150th anniversary of her birth*, which is being jointly conducted over a three-year period by scholars from the Universities of Bologna, Milano-Bicocca, Lumsa (Rome), and Valle d'Aosta. Identifying the multiple meanings that Maria Montessori attributed to the term *nature* in her writings offers a valid starting point for a rigorous thematic analysis of the secondary literature that has been produced over time, thanks to the efforts of leading Italian journals such as "Vita dell'infanzia" and "Il Quaderno Montessori", as well as international publications such as the "NAMTA Journal". "Montessori Life", "Montessori International", "AMI Communication", etc. In the present paper, we have focused on the multiplicity of meanings associated with the term "nature" in Montessori's own work, but her multifaceted vision of nature has been further developed and expanded from a range of perspectives in the secondary literature (Various Authors, 2013; Durakoglu, 2014; Caprara, 2018; Honegger Fresco, 2020). Thus, having defined the key concepts in Montessori's own writings that are salient to a Pedagogy of Nature, our goal in future studies will be to extend our analysis to the secondary Montessori literature on the theme of children and nature. This will be with a view to establishing which aspects of Montessori's thinking about nature have been received and emphasized, and which – in contrast – have been forgotten across different cultures. The output of this exercise will be an analytical and synoptic framework of comparison of Italian and American secondary writings on the specific key topics outlined above. Indeed, as mentioned in the opening section of this paper, the Montessori method has not only been translated into different languages, but its contents have also been adapted to

different cultural settings. The various themes covered in Montessori's writings have been welcomed across different cultures and time periods as a function of local needs, expectations, applications, and misapplications. The topic of *nature* has not been exempted from this process. Finally, we shall investigate whether and how research has informed educational practice and the extent to which Montessori's educational approach has been metabolized and incorporated into those sectors of education that are currently most conscious of the environment, nature, and sustainability. We will assess the characteristics – and whether they are acting as a driving force within education – of novel educational settings that are on the rise in Italy and whose purpose is to offer our youngest digital citizens intimate experiences of the “natural life” and life in nature: outdoor schools, farm nurseries, woodland kindergartens, and woodland schools.

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### Notes

<sup>i</sup> That the theme was the object of lively contemporary interest is borne out by the publication in the same year of a book by Adelaide di Bello that was also entitled “Nature in education” (Tipografia Tadde-Soati, Ferrara, 1909, p. 107). This work was a little over a hundred pages long, and the author, who had only just completed her studies, stated that: «On the topic that I set out to examine, I have reviewed, so to speak, all that from books and especially from the sound teaching that came to me from the Professor's Chair [...]». She did not make any reference to Maria Montessori.

<sup>ii</sup> Specifically, our analysis of the chapter *Nature in Education* draws on the critical edition of *Il metodo della pedagogia scientifica applicato all'educazione infantile nelle Case dei Bambini* edited by the Opera Nazionale Montessori (2000). This gave us access to the passages that had been changed, eliminated, substituted, and added over five different editions (1909, 1913, 1926, 1935, and 1950 under the title *La scoperta del bambino [The Discovery of the Child]*).

<sup>iii</sup> The difference of meaning between the terms garden/gardening [giardino/giardinaggio] and vegetable patch/vegetable growing [orto/orticoltura] conceals a hint of the social tension between city-dwellers and farming/country people that long characterized post-Unification Italy. Maria Montessori consciously chose to stay out of this debate, opting to use – in the writings under study here – the term “garden”, which recurs over 30 times. Nevertheless, even one appearance of the term “orto” [vegetable patch] (of which there are two occurrences in total) is enough to give us an insight into Montessori's views on the matter: «Once, a little girl who had been brought up to worship the “flowers” and “gardens” of which her mother and schoolteachers had always ensured were never lacking, was looking down from a balcony, with evident, restless enthusiasm. ‘Down there’, said her mother ‘is a garden of things to eat.’ It was a vegetable garden, which seemed to the mother to be entirely unworthy of admiration: the little girl on the other hand was enthusiastic about it» (Montessori, 1950a/2000, p. 315).

<sup>iv</sup> For a more in-depth treatment of Maria Montessori's thinking about gardening practices, see Bertolino, F., Filippa M., Perazzone A. (submitted, 2021). *Experiencing domesticated nature at school: aims and pedagogical perspectives of the School Garden*.

<sup>v</sup> For a more in-depth treatment of Maria Montessori's thinking about a tailor-made object and the concept of affordances see Nuti, G., Filippa, M. (2020), Beyond Montessori: comparative and diachronic reflections on the theme of differences. *Studi sulla Formazione*, 2.

<sup>vi</sup> The version of this chapter contained in *La scoperta del bambino [The Discovery of the Child]* (1950a) was republished unabridged in the volume *In giardino e nell'orto con Maria Montessori* (De Sanctis, 2010). Thanks to the wide circulation of this book, Montessori's ideas about the relationship between children and nature have spread outside of academia and Montessori training colleges, gaining widespread recognition for their clarity, force, and continued relevance.

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