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Introduction. Political education in the Anthropocene: a metamorphosis to sustain the human adventure

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Abstract This introductory chapter consists of the following sections: (1) Is there still time to educate? The Anthropocene as a political challenge to education; (2) Change nothing or change everything?; (3) Moving beyond education for sustainable development; (4) Rethinking an educational anthropology in the Anthropocene ; (5) Some educational recommendations in the Anthropocene.

Keywords: political education, Anthropocene, metamorphosis, human adventure

I. IS THERE STILL TIME TO EDUCATE? THE ANTHROPOCENE AS A POLITICAL CHALLENGE TO EDUCATION

"I want you to panic," says Swedish teenager Greta Thunberg, who has decided to go on strike because of the irresponsibility of the world's governments in destroying our planet, our only home.⁵

Indeed, in 2009 Swedish environmentalist Johan Rockström and twenty-eight of his colleagues report in *Nature* that we have crossed three of the nine planetary boundaries they identify as being important to respect if human life in society is to remain possible (Rockström, 2009). These three boundaries are: climate change, the rate of biodiversity loss, and the alteration of

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⁵ This collective work consists of the translation of the contributions published in the collective work *L'éducation en Anthropocène* published by Editions du Bord de l'eau in 2019 (edited by Nathanaël Wallenhorst and Jean-Philippe Pierron) and in the translation of the articles published in issue 58 of the educational science journal *Le Télémaque* on the theme of political education in the Anthropocene coordinated by Renaud Hétier and Nathanaël Wallenhorst (2021).

biogeochemical cycles. In 2015, these same authors extended their work and published "Planetary Boundaries: Guiding Human Development on a Changing Planet" in the major international scientific journal *Science* (Steffen, 2015). We note here that the two largest scientific journals ratify the existence of planetary boundaries. They reassess the indicators for monitoring the Earth system but also affirm and elaborate their model. In just a few years, the situation has deteriorated considerably: the boundary of bio-geochemical cycles has been crossed twice (the boundary of the phosphorus cycle has now been crossed in addition to that of nitrogen, which had already been crossed) and an additional boundary has been transgressed, that of land use change. In January 2022, an international team of fourteen researchers, led by Linn Persson, a chemist at the Stockholm Environment Institute, reported that a fifth planetary boundary had been crossed, one that threatens to destabilize the Earth system: that of chemical pollution, known as the "introduction of new entities", which includes plastics. In this article, entitled "Outside the Safe Operating Space of the Planetary Boundary for Novel Entities" (Persson, 2022), their observation is vivid: "Chemical production has increased 50-fold since 1950. It is expected to triple again by 2050. We recommend urgent action to reduce the damage associated with exceeding the limit by reducing production and releases of new entities, while noting that even so, the persistence of many new entities and/or their associated effects will continue to pose a threat." In late April 2022 another Swedish research team, from the Stockholm Resilience Centre states that with so-called "green water" (precipitation, evaporation and soil moisture) a sixth planetary limit is being crossed as a result of human activities (Wang-Erlandsson, 2022).

In 2011, the American biologist Anthony Barnosky and eleven of his colleagues, showed that we are en route for a sixth mass extinction of species - again undermining human life in society (insofar as coexistence with other living beings allows us to live) (Barnosky, 2011, then Barnosky 2012 and Ceballos, Dirzo, Ehrlich, 2017). In 2017 the French researcher Marion Bador carried out prospective studies and showed, together with six of her colleagues, that top temperatures in heatwaves may well reach 55°C in Eastern France in 2100 (Bador, 2017). In 2018, the American chemist Will Steffen and sixteen of the most prestigious environmental scientists stated that the Earth is becoming a steam room in which several regions of the world will no longer be hospitable to human life in society (Steffen, 2018). According to these authors, the situation is serious: after +1.5°C to +2°C of warming, the Earth system runs the risk of experiencing a set of runaway effects that could lead to +5°C of warming (making human life in society impossible in many parts of the world). These few articles are only a small sample of the scientific studies that have been conducted and published.

We have permanently altered the conditions of the Earth's habitability for all living things. This anthropogenic alteration of the Earth system has a name: Anthropocene. The Anthropocene includes the chemical changes in the atmosphere and the oceans, ongoing global warming, the alteration of biodiversity and the collapse of ecosystems as well as our human responsibility for these changes and the adventure that lies ahead.

This is a term that is currently being debated and we are dealing with a set of controversies. "When did the Anthropocene begin?" stratigraphers ask. Was it in the Stone Age with the discovery of fire, with agriculture, the meeting of the Old and New Worlds, the industrial revolution, the explosion of the first atomic bomb or the acceleration of consumption in the 1950s? "Who is this undifferentiated *anthropos* at the heart of the Anthropocene narrative?" ask philosophers and political scientists. Indeed, the least we can say is that human societies are characterized by their cultural and historical diversity and that each of them, in the case of civilizations, is still marked by great socio-economic differences, and we cannot pretend that it is a universal *anthropos* that is responsible for this. Thus, there is a lively debate among intellectuals, some of whom would prefer us to speak of the Capitalocene.

The situation is serious and yet the policies implemented remain timid. As for education for the Anthropocene, which should be a priority if we consider that today's children and adolescents will be the most exposed to the Anthropocene and to the changes in lifestyle that it will make necessary, it remains a dream. School curricula have long been slow to work on geoscientific knowledge in the classroom and are slowly adapting. For several decades it was a lie by omission, a real political scandal in the history of the human adventure. If we have only a decade left to prevent our planet from becoming a steamy place unfit for human life in society, what can we do? Can adults still dare to claim any kind of authority? Does education still have a meaning? Is it still possible to believe we can educate? The geoscientific data of the Anthropocene bring with them urgent political temporalities that call into question the very way education is organized - assuming we have a few decades ahead of us. Is it not preferable for young people to learn to live together on their own, free from the burden imposed upon them by previous generations whose legacy seems to consist only of debts? Or is it still possible to commit ourselves together, young and old, to an odyssey for a habitable Earth, as François Prouteau proposes here in this book? This is a lively question that the authors of this book have been working on for some years (Hétier, 2021, 2022; Hétier and Wallenhorst, 2022; Testot and Wallenhorst, 2022; Wallenhorst, 2019, 2020, 2021, 2022, 2023; Wallenhorst and Wulf, 2022, 2023; Wulf, 2022a, 2022b) in the presence of many others (Leinfelder, 2013; Curnier, 2017, 2021; Renouard et al. 2020, 2021; Priyadharshini, 2021; Tannock, 2021; Paulsen, Jagodzinski, Hawke, 2022; Wallace, Bazzul, Higgins, Tolbert, 2022; Jagodzinski, 2018).

The political questions posed by the Anthropocene for education are very serious. This is not a new theme to address in education, but a new paradigm within which to address all educational issues now facing unprecedented difficulties. This is what the authors of this book have tried to address.

II. CHANGE NOTHING OR CHANGE EVERYTHING?

Our entry into the Anthropocene marks a decisive stage in our human adventure and throws up unprecedented existential questions. The relationship we have maintained with our environment for nearly two centuries may in turn compromise the continuation of the human adventure. The growing awareness of our entry into the Anthropocene defines a relationship to the future that is unprecedented in history. This marks a break with the relentless pursuit of progress that permitted a certain improvement in the material conditions of life. We have left the ascending linearity of Western modernity.

The change that this entry into a new geological epoch of an anthropogenic nature would mean for humanity encourages us to think in new ways. *First*, the Anthropocene is related to humanity's geological power. If we humans do not want to be destroyed by this power, then we must stop suffering through it and learn to manage it. *Secondly*, the Anthropocene reminds human beings of our profound dependence on the environment. It is this that makes our adventure possible, since it can only take place within it. *Thirdly*, with the Anthropocene the biosphere has left its cycle of climatic self-regulation. As well as doubts about whether the quality of life can improve in the future, it is the very existence of a possible future that is the subject of contemporary uncertainty. The Anthropocene thus signifies humanity's power, but also the vulnerability of our dependency and the uncertainty of our continued adventure.

The Anthropocene is characterized by a combination of certainties and uncertainties that relate to both geoscientific and political/social data. The reliable geoscientific data relate to what we identify as the long term (i.e. at least the next few millennia): the climate will be warmer, the atmosphere denser in CO₂ and methane, the oceans more acidic and covering more surface area, reciprocally there will be less land, the ecumene (the space of human habitability of the Earth)

will be reduced, biodiversity clearly diminished, the heat waves during which areas will be characterized by human non-habitability will be more frequent and stronger... The available data, which are still uncertain, concern a change in the global state of the biosphere and a break in its systemic organisation leading to a reorganisation of life forms, the possibility or impossibility of guaranteeing world food production, the extent of the destruction of biodiversity, or the level of stabilisation of the temperature at the Earth's surface...⁶ In the political and social register and the organisation of human societies, we are also dealing with a combination of certainties and uncertainties. We can say that we know that the dominant economic model of globalized postmodern societies will not be sustainable in a few decades and that some of the elements of collapse that were experienced at the beginning of the 21st Century with the *subprime* crisis and the collapse of the American bank Lehman Brothers are bound to increase in the decades to come. We also know that the 21st Century will be marked by a series of population migrations due to the impossibility of continuing to live in certain geographical areas. It is also a given that access to drinking water will be a problem for many human beings. What we have not yet fully identified is the extent of the political and social changes. Will 75% of the human population be exposed to life-threatening heat? (Pal and Eltahir, 2017) Will global food security be jeopardized? Will we experience a widespread collapse of our economic system and a set of wars for survival on the surface of the globe?

As we have just identified, the Anthropocene links the long history of the Earth with the short history of the human adventure. When, as educators⁷ we face these issues, both geoscientific and politico-social, we identify two major viewpoints. The first is that we should not change a great deal and carry on living. But we must distinguish between “business as usual”, the pursuit of a destructive economy and of education or training that prepares individuals to play an active role in it, and, on the other hand, maintaining a space of educational security. The possibility of a disaster of unprecedented proportions should not invalidate childhood and all that is playful, carefree and innocent. Nor should it mean renouncing education and preparing for the future. Even in the face of uncertainty, parents must continue to play with their children - whether it be handball, Mario Kart or Monopoly. Teachers must continue to teach little children to read. Academics, whether in psycho-sociology, fluid mechanics or medicine, must continue to teach their students. Adult educators must continue to accompany their trainees in their vocational search, enabling them to focus on others in the performance of their work. The role of the educator is to allow life to be lived in a human and dignified way. Thus we see that the Anthropocene does not alter the function of the educator - fortunately. There are things that must continue: playing with one's parents; learning to become autonomous for one's future journeys in the world, through reading, writing and arithmetic; developing skills and finding a place on Earth among humans; constructing meaning in one's existence throughout one's life.

The second viewpoint is radical - but can be linked to the first. The Anthropocene is characterized by a break with the previous geological epoch, the Holocene, in terms of systemic elements that are perceptible in every corner of the globe (alteration of the bio-geochemical cycles of carbon, nitrogen or phosphorus; alteration of the chemical constitution of the

⁶ This collective reflection focuses on the implications of the Anthropocene for education. Readers wishing to learn more about this new geological epoch, the Anthropocene, may wish to refer to a number of recently published books: *Aux racines de l'Anthropocène - Une crise écologique reflète d'une crise de l'homme* by Michel Magny (Le Bord de l'eau, 2019), *L'Anthropocène décodé pour les humains* by Nathanaël Wallenhorst (Le Pommier, 2019), *Pour une philosophie de l'Anthropocène* by Alexander Federau (PUF, 2017), the *Dictionnaire de la pensée écologique* by Dominique Bourg and Alain Papaux (PUF, 2015), or *L'événement Anthropocène* by Christophe Bonneuil and Jean-Baptiste Fressoz (Seuil, 2013).

⁷ In this book, the figure of the educator is considered in a broad way. It covers here the functions of teacher, specialised educator, adult trainer, parent, and, even more globally, it can sometimes refer to experiences of accompanying or supporting relationships.

atmosphere; changes in the climate; an unprecedented increase in the rate of extinction of living species, etc.). Just as the Anthropocene is characterized by this systemic change, so education in the Anthropocene is characterized by radical changes in education, as it was constructed in the Holocene. These changes may be of the same magnitude as those that characterized the changes between the modes of conveying knowledge that were in effect during the Pleistocene (2.58 million years ago to 11,700 years ago) and those that developed during the Holocene (11,700 years ago to today) that were then characterized by the emergence of education with the formalization of teaching. What might be the characteristics of this education in the Anthropocene? It is to be imagined, created and implemented. Is it not necessarily radical or at the root of things?

We must indeed continue to educate and train individuals, to make them both human and competent. But this does not mean that we should carry on as if nothing had happened, i.e. by continuing to blindly adapt to an economic system that is deleterious to the planet, on the one hand, and, on the other, one thing leading to another, by maintaining an attitude of ignorance, insensitivity and fatalism with regard to the destruction of the Earth. Most people are victims of the consequences of the Anthropocene, but they are also stakeholders. If the main purpose of education is to obtain the highest level of qualification for prestigious and highly paid jobs, this makes it difficult to be attentive to the Anthropocene at the same time. In concrete terms, the individuals who earn the most money are also those who pollute the most (big cars, swimming pools, etc.). Other educational goals are possible, without relinquishing the highest standards, but this time with the objective of self-fulfilment (which does not necessarily involve material goods) that can also be open to others and the world. An education *in the* Anthropocene must therefore make one fully aware of the consequences of one's choices and actions, of one's professional and existential orientation. There are obviously things to be avoided, such as over-consumption... as soon as we have the means. But there are also things to do, things that are possible, eco-citizen actions as much as political choices, as long as one has learned to be attentive and sensitive to them and as long as cowardice and enjoyment are not hidden behind a fatalism (“it's too late”, “it wouldn't make any difference if I took public transport”, etc.).

III. MOVING BEYOND EDUCATION FOR SUSTAINABLE DEVELOPMENT

Do education for sustainable development or environmental education respond to these challenges? They represent a significant contribution to education because they propose another way of thinking about it (Sigaut, 2010-2011, p. 66; Shaw, Oikawa, 2014; Shephard, 2015; Filho, Nesbit, 2016; Summers, Cutting, 2016; Barthes, 2018; Filho, 2019), which, in addition to the objective of ecological preservation, aims to enrich the meaning of life (Brière, Sauv , Jickling, 2010-2011, p. 251). This is in line with the goals we have identified above. Environmental education also has the advantage of having a political component (Sauv , 2009) by helping to prepare citizens to participate in public affairs and to play a political role (Brière, Sauv , Jickling, 2010-2011). Within the *Dictionnaire de la pens e  cologique (Dictionary of Ecological Thought)* (Bourg and Papaux, 2015), for example, education is one of the themes of ecological thought in the two entries out of three hundred and fifty that are devoted to it: “Environmental education” and “Education for sustainable development”. These see the issue of environmental education as “learning to ‘live *here* together’” (Sauv , 2015, p. 376). These two entries make it possible to pose certain fundamental educational challenges, but they do not mention a paradigmatic revolution in education resulting from the entry into the Anthropocene.

In 1987, the United Nations World Commission on Environment and Development, chaired by Norway's Gro Harlem Brundtland, published a report entitled *Our Common Future*, using the term “*sustainable development*” for the first time. It defined sustainable development as “a

pattern of development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. That was 35 years ago... Since then, the first future generations are now 30 years old - even if the future in question does not necessarily refer to generations whose contemporaries we will be one day. These future generations are questioning what we have been able to do for them in terms of education - following the example of the young Swedish woman Greta Thunberg who, at the age of 15-16, challenged all the adults responsible for the world. Since then, too, sustainable development has become an equivocal concept. It is suspected of being nothing more than a rhetorical strategy in its weak version, aiming to pass on to future generations the technical means to compensate for their environment, but without giving up the idea of growth, with the concept of “green growth”. In its strong version, it calls for thinking in terms of sustainability in order to accompany an ecological transition in society. However, sustainable development is gradually giving way to the idea of ecological transition, which is now being replaced by the idea of the Anthropocene. This semantic shift has a major significance: from the economic-ecological issue, we are moving on to considerations of a different scope and depth: an anthropological issue questioning “technological civilization” and its anthropic (having to do with the human adventure) if not entropic (unpredictable disorganisation) effect. The notion of the Anthropocene is not itself without discussion, as the concept of the *anthropos* embraces the whole of humanity in our responsibility and response to the ecological crisis, even though it is perhaps only an Ethnocene or a Capitalocene. We must therefore, when speaking of education and the Anthropocene, clarify the meaning and scope of this concept. In any case, this invites us to make a double shift, not to say to admit a double failure: that of the educational responsibility of generations that amputate the future of those who come after them; that of the concept of sustainable development that is not relevant enough to produce a satisfactory understanding of our historical situation.

In this chapter, we do not want to simply be followers of fashion: first came education for the environment, then education for development, then education for sustainable development, and there should be education for the Anthropocene. Our aim will not be to think of an education *for* the Anthropocene but an education *in the* Anthropocene. The challenge is not to teach an additional subject but to think about education in a new way. This suggests that the Anthropocene would redefine a new framework of interpretation, a new symbolic framework within which to learn to understand the place of humans in their relations with themselves and others, including non-humans and nature. If so, what would it consist of? Does this not also suggest that such education should have several aims – those of shaping, informing and initiating? By analysing the relationship between education and the environment in a different way, we propose resolving the tensions that exist around education for sustainable development (integrating economic and sustainable development issues) and environmental education or education relating to the environment (integrating more educational and social issues). In fact, the Anthropocene makes it possible to question some of the founding paradigms of education in the West since the Enlightenment.

This education *in the* Anthropocene integrates an education *for* the Anthropocene through engendering an awareness of the Anthropocene and its impacts (for example in terms of the understanding of the Enlightenment, or of modernity and all its dualisms). This education *for* the Anthropocene is political and requires a form of courage. Indeed, the strengthening of climate and environmental education is regularly questioned, as was noted in this article in *Le Monde*, written by Audrey Garric and Marine Miller on 23 March 2019 “Climate disruption is taught too little, from school to university”. Here, these two journalists mention that teachers and researchers are increasingly critical of the insufficient space given to climate change in various school curricula. This is also noted by the authors of the *Manifesto for Climate Justice*

published in March 2019, directed at teachers. They propose marking a real break with education for sustainable development by no longer allowing students to believe that the situation is under control and being addressed by the world's leaders and entrepreneurs. The situation is critical, and it is important for teachers to take a stand. Indeed, it is difficult, if not impossible, to be moderate when identifying the magnitude of contemporary environmental problems. When the knowledge of the Anthropocene has taken hold within teachers involved with it, it results in those teachers becoming serious and radical. These positions need to be expressed in the classroom, in line with the *Manifesto for Climate Justice*, even if this means that the classroom becomes a militant space. This is also what the 300 signatories, European scientists and academics, proposed when calling for a school climate strike.

We can see here how much the Anthropocene touches the heart of education. Educational paradigms are being shaken up and need to be rebuilt: there needs to be a definition of what it means to educate in the Anthropocene. Since education is the political means par excellence for sustainable changes in the medium and long term, we need to think about the style of education needed for us to think, live and act together in the Anthropocene, which involves real and profound anthropological changes. This collective reflection is only a first stone in a vast edifice under construction.

IV. RETHINKING AN EDUCATIONAL ANTHROPOLOGY IN THE ANTHROPOCENE

The contributions in the first part of this book aim at assessing the impact of the idea of the Anthropocene on the type of anthropology that underlies education. The concept of the Anthropocene is not simply a reminder of the importance of the environment for humanity. The Anthropocene, which constitutes a break in geological eras, also constitutes a break in the way humanity conceives of itself. It is therefore necessary to rethink the human condition; this is what this book begins with. It is a question of learning to think about humanity in a new way, breaking with the anthropology of the uprooting of humanity from nature that has long prevailed in the West. The geological power of the human being and the advent of the Anthropocene are impacting the definition we have of ourselves since Aristotle's *zoon politikon*. Should humans, who since the Ancients have mostly conceived of themselves within the framework of an anthropology of their condition being removed from nature (separate and above), not become earthlings by assuming their belonging to the Earth (Bonneuil, 2015, p. 38)? Is it not now necessary to think of humanity within the framework of an anthropology of immersion in nature (Papaux and Frigerio, 2015), recognising that to know human beings means “first of all situating humans in the universe, and not cutting them off from it” (Morin)? The anthropology of humanity's removal from nature underlying the ideal of progress is not sustainable in the long term. Humanity is not only defined intrinsically and statically, but also in terms of what it can and will become within the environment that hosts it.

The first chapter, entitled “The emergence of the Anthropocene, an astonishing revelation of the human condition”, is written by the education researcher Nathanaël Wallenhorst and the psycho-sociologists Jean-Yves Robin and Jean-Pierre Boutinet. It questions the ambiguous and militant use of the term Anthropocene, its scientific originality and whether it is helpful in analysing the human condition. The dating of our entry into the Anthropocene is subject to lively debate within the geological community. Did we enter the Anthropocene in the Stone Age, with the development of agriculture, with the collision of the Old and New Worlds, with industrial modernity, with the great acceleration of consumption in the mid-20th century, or with the explosion of the first nuclear bombs? Or is it somewhere in the future? Whatever the geological community actually chooses, the various hypotheses for dating the entry into this new geological era function as a mirror of the human condition in the light of postmodernity.

The authors show that our ways of thinking are struggling to understand this coming world, which we are entering with full force and within which it is important to give meaning to the human adventure.

The philosopher and environmentalist Alexander Federau is the author of the second chapter, “Martians and earthlings: what anthropology for the Anthropocene?” Starting from the observation that nature is disappearing before our very eyes and that the catastrophes of the present time are irreversible, Alexander Federau's contribution questions one of the fundamental issues of the Anthropocene. Thus, what is important is not “to save the Earth, which does not need it, nor life, which will find its way”, but rather “to preserve as much as possible the conditions that have allowed our societies to flourish and prosper”. It is our relationship to nature that must be rethought, thus bringing about a considerable broadening of our human identity: we are of the Earth before we are of a country or a family. Here the war of ideas and the political battle is open: are we going to continue this senseless race of industrial modernity and do everything possible to colonize the planet Mars? Are we destined to become Martians? Or, on the contrary, are we going to “mutate” and become the earthlings that we are potentially? This second option, which presupposes real changes in our lifestyles and our anthropological conceptions, appears to be the challenge of the present time.

The reflection continues with the anthropologist Yoann Moreau in his chapter entitled “Who is the subject of the Anthropocene? The use of personal pronouns to express human involvement”. The Anthropocene opens up the possible end of the human adventure. What should we think about this? Here, one of the challenges of education in the Anthropocene is political: it is a question of enabling human subjects to position themselves within predatory human societies that are massively destroying their environment. Yoann Moreau proposes a reflection on language whose power can be educational and mobilizing. He works on three modalities of expression of the self within collectives: in French the personal pronoun *nous*, the indefinite pronoun *on*, or the “obsolete nominal form *gent*”. Through an analysis of how these forms of self-expression complement each other, we understand that, if the Anthropocene challenges us to think, it is only a means to an end concerning what we are going to do with what we know about ourselves.

The fourth chapter, written by the philosopher Emmanuel Nal, poses the question of care and reciprocity from the outset, notably on the basis of *care* as defined by Tronto. The author uses Heidegger's concept of being in the world. The idea of “being in the world” is interpreted as a calling: no being without the world, on the one hand, no being that is not dedicated to the world, “for” the world, on the other. We are, consequently, in a position to inhabit the Earth (and not only to be on it). The world takes care of us by sheltering us, and in return we are in a position to take care of it, that is to say, to “take care of the dwelling place that gives us back to ourselves”. Against the paradigm of domination (and exploitation), we must then think of a certain “withdrawal”, not in the sense of wishing the disappearance of a harmful humanity, but in the sense of “letting the otherness of the living express itself”.

Responsibility appears here to be a determining factor and one of the political aims of education. It is in the light of Paul Ricoeur's anthropology that the fifth chapter, written by the philosopher of education François Prouteau, questions education for responsibility in the Anthropocene. Ricoeur's anthropology of vocation is based on freedom and responsibility, not in the domination of other living beings, whether human or non-human, but in order to live together safely with others. François Prouteau considers education in the Anthropocene against the background of an anthropology of the capable *anthropos*. Although humans have participated in the massive destruction of living things and so often fail to build a common world, they are still political subjects capable of being human, but also of becoming more alive (as part of the interdependent fabric of living things) and earthbound (belonging to the cosmic adventure of

the Earth). This chapter sets out a humanism of the Anthropocene based on the notion of responsibility that yields “neither to the siren song of a naturalist ideology nor to the anthropocentric humanism of a human being who despoils nature.” He therefore proposes an education for democracy, but within the complexity of life.

Then, in the sixth chapter, the contribution of Melki Slimani, Angela Barthes and Jean-Marc Lange aims to establish the principles of an education in politics that will meet the challenges of the Anthropocene. The authors first discuss the notion of event, based on Deleuze and Guattari, as intensity, excess, and potential. The Anthropocene is thus approached as a global event, both as a Plantationocene and a Capitalocene, and not only as a bio-geo-chemical fact. In fact, this new “geological” epoch is also strongly rooted in social life, with inequalities in responsibility, but also the inequalities that the degradation of the Earth's habitability conditions will create. Thus, there is the need for political education (and not only scientific education). This is broken down into three learning processes: literacy, participation (for critical citizenship), and deliberation, these three processes being ultimately linked by lived experience, particularly that of collective action.

V. REFOUNDING EDUCATIONAL CULTURES AND INSTITUTIONS IN THE ANTHROPOCENE

The contributions in the second section propose linking the notion of the Anthropocene with cultures and institutions. As a geophysical phenomenon with a strong social impact, the aim is to see how cultures, in their diversity and plurality, as well as institutions, receive, interpret and respond to the general mutation that is the essence of the Anthropocene. The chapters in this part include an ethical and political component. They allow us to “inculturate” the notion of the Anthropocene and to distance ourselves from its possibly ideological and totalizing component. It is a question of re-evaluating and going beyond “environmental education” and “education for sustainable development” and of working towards a form of “inculturation” of the notion of the Anthropocene. This makes it possible to develop a critical distance from the concepts of learning and competence in the predominantly developmental educational model. It is also a question of distancing ourselves from evolutionary psychology, which underpins instrumental rationality, from the critiques of *care* theories (Gilligan, 2008) and eco-feminism to the work of Gaston Pineau on eco-biography (Pineau and Legrand, 1993).

The seventh chapter, “The Anthropocene. From Critique to Action: Observations on a Strategy for Sustainability”, by the educational anthropologist Christoph Wulf, who is particularly involved with UNESCO, takes as its starting point our dual heritage a heritage from both nature and culture, and seeks to turn critical reflection into action. To do this, it is important to accept new grand narratives, even if they are utopian.

The eighth chapter, entitled “Understanding the Anthropocene as an interpretative framework for the act of educating”, is written by the philosopher Jean-Philippe Pierron. While Kant wondered what it would be like to educate in a century that was becoming aware of itself, Jean-Philippe Pierron asks what it would be like to educate in a new geological epoch. Education is urgent and what is particularly important is to think about it politically by taking a step back from the questions of methods and content that have dominated educational thought. Jean-Philippe Pierron understands education in the Anthropocene as a “total anthropological fact” and sees the Anthropocene having an impact on three aspects of education: on the knowledge of the world to be conveyed (information), on the ethics vis-à-vis future generations (training) and on the style of human being to be brought to life on earth (initiating). These three levels allow us to think of a new institution for children and to understand education in the Anthropocene as a new concrete utopia. This education is part of a necessary renewal of pedagogical thinking.

Environmentalist and education researcher Daniel Curnier continues our educational theme in the ninth chapter entitled “Educational policies, sustainable development and the Anthropocene: visions, limitations and opportunities”. School is at the centre. Why has school failed so badly to adapt to the challenges of sustainability? How might it adapt to these challenges, on the one hand, but, above all, how might it play a central role in consolidating the sustainability of the human adventure? To do this, we must not be afraid to radically rethink the institution of school. In his analysis, Daniel Curnier shows that school is the product of the paradigm of modernity, and thus “inseparable from the process of industrialization of the Western nations” from which it is absolutely necessary for it to extricate itself. This means that it must leave behind the economism that organizes it the logics of which are hegemonic. The case is not won because the OECD, the Organisation for Economic Co-operation and Development, plays a central role in the organisation of educational policies. Indeed, it is this economic organization that pilots the PISA studies (on the skills acquired by pupils at the age of 15), whereby countries enter into competition with each other, all centred on the adaptation of pupils to the logic of the economic market, a world away from the issues of the sustainability of the human adventure revealed by the Anthropocene. But these limitations do not justify Daniel Curnier's hope that the institution of school will undergo profound changes.

Economist Christian Arnsperger is the author of the tenth chapter: “Will we ever be indigenous? Permaculture and education from the depths”. Is the most important purpose of education in the Anthropocene preparation for the future? No, replies Christian Arnsperger unambiguously: “Contemporary humanity has so lost itself in the clutches of its own confusion that it cannot 'prepare' anything without reproducing, once again, the profound errors of its past by projecting them into the future”. What is fundamentally important is to reconnect with our roots of indigeneity. Indeed, since our recent sedentarization, about 10,000 years ago, we no longer know how to be indigenous. The learning of education in the Anthropocene takes us beyond our Promethean mastery to its counterpart: our incorporation into ecosystems. The challenge here is that we succeed in accomplishing an anthropological mutation that will take us from a mode of being in the world that is that of the *taker* (who takes in his own hands) to that of the *leaver* (who deposits in the hands of the gods). This implies a set of concrete changes, starting with our modes of agricultural production, which can in turn be a fertile source of inspiration for thinking about the act of educating and “permaculture as education from the depths”.

But how, in concrete terms, can this anthropological transformation, which the various contributors to this book call for, come about? It is through mimetic processes, rituals and gestures, says educational anthropologist Christoph Wulf, author of the eleventh chapter: “Transformation in the Anthropocene - Mimesis, rituals, gestures”. Thus, we have to invent new processes that are part of this great narrative of sustainability. Here the reflection is directly educational since it is new forms of mimetic, ritual and gestural learning that will allow us to incorporate sustainability in our collective actions. The gradual establishing of a new sustainable culture takes place through practices that are essentially mimetic. Moreover, rituals are important for the new foundation of an education because of their performative and social component. Finally, gestures materialize our presence in the world and the resistance of which we are capable. They embody a set of meanings and leave a lasting mark on the imagination.

Nathanaël Wallenhorst's contribution, in a twelfth chapter entitled “What does the Anthropocene hold for citizenship?”, introduces us to the Anthropocene, by contextualising the concept and dating its occurrences. Indeed, the urgency of the situation can impede thought. First, with Daniel Curnier, citizenship is approached as being more than individual gestures (eco-gestures, in particular), having to be marked by new ways of living, and of living together. Then, with Christian Arnsperger, the perspective becomes more that of an “existential citizenship”, which is a mobilizing force for individuals, towards getting out of capitalist

development and entering into existential development. Finally, Andreas Weber suggests the possibility of going even further, by entering into a relationship with the “whole”, with other forms of life. *In the end*, the concept of citizenship is extended far beyond mere (individual) participation in institutional moments, beyond an individual role, into a commitment to and for life.

The thirteenth chapter, “To educate is to begin to do something”, by the philosopher of education Renaud Hétier, starts from an observation of collapses. The collapse of life, in the Anthropocene, is well identified. Other collapses seem to precede it: spiritual and mental collapses. A spiritual link to the world allows us to be available, receptive. However, our materialism tends to fill all the gaps and prevent this availability. Our mental powers allow us to support and take care of ourselves. However, multiple compensations make us dependent and deprive us of our strength. It is then a question of thinking of an education that breaks with the current conditions of childhood, marked by educational overprotection, and an omnipresence of screens, which both separate us from the world and make life abstract. Such an education aims jointly at feeling, thinking and participating. It must first and foremost ensure that children are rooted in the world, in life (to feel the pleasure of being), so as to give them the strength needed to resist.

VI. SOME EDUCATIONAL RECOMMENDATIONS IN THE ANTHROPOCENE – PEDAGOGICAL APPROACHES, EXPERIENCES

The objective of the third section is to present proposals and recommendations for educational practices. How can young people and future generations become fully aware of the vulnerability of the biosphere to human action in order to rewrite it to ensure the continuation of our adventure? This section brings together pedagogical reflections and empirical contributions which discuss experiments on how to prepare for the future in the field of education. These chapters show a creativity and practical inventiveness through which we perceive that tomorrow is already being invented today.

The fourteenth chapter, by the philosopher of education François Prouteau, “Ecological transition and education as an odyssey”, evokes an “odyssey”, in reference to the Homeric trajectory. One of the problems we face as humanity is that we do not always have the right words, the right concepts or the right narratives to think about and accept the far-reaching change that is needed. The author finds references that can support us in the Bible, and even more so, in the Odyssey. Thus, with Ulysses, it is a question of taming his *hubris*. It is a question of thinking about hospitality in a new way, and not limiting ourselves to the environmental dimension of the problem we are facing, which is also a problem of law and justice. The challenge is to aim for a transformation of ourselves in relation to the other and to the environment. The struggle of young people, in particular, which can be supported by the figure of Telemachus, is illustrated by the initiatives of the *Student Manifesto for an Ecological Awakening* and by the *Transition Campus*. The resilience of our common home also depends on their commitment.

The fifteenth chapter, written by the philosopher Jean-Marc Lamarre, “Educating for a sense of limits and limitlessness in the Anthropocene”, first makes the link between the capitalist model (unlimited growth and production) and the Anthropocene, particularly in the era of globalized consumerism. The lesson to be drawn from such an observation is obviously to be able to return to a sense of limits, and, if these are not imposed by authority, to a capacity for self-limitation. But the difficulty lies in being able to create a positive (and not “punitive”) dynamic and at the same time not to interfere with the legitimate aspiration to fulfilment, to “self-realisation”. The solution proposed in education is that of a link between self-limitation and the “anthropological

potential for limitlessness”⁸, through an investment in the resonances offered by the relationship with the other and a poetic relationship with the world.

The sixteenth chapter, "Learning to live in the Anthropocene" is written by the philosopher of education Renaud Hétier. Here, education is a matter of limits. Living in the Anthropocene implies integrating a set of limits, starting with the planetary limits that we are constantly crossing in an ever-increasing proportion. How does the child learn to live? First of all, by supporting himself with limits, says Renaud Hétier, notably from his reading of Rousseau's *Emile*. But, more fundamentally, it is by learning to make life happen that the child *really* learns to live. Indeed, living, which presupposes a pre-emption necessary for the maintenance of life, cannot be the sole purpose of an education in the Anthropocene. It is also a matter of learning to make life happen by being creative and working towards a re-enchantment of the relationship with the world. Paradoxically, this creativity called for by the fact of making life happen comes from the child's "anthropological potential for limitlessness" (Bourg and Arnsperger, 2017). This is not experienced in transgression with a view to maximizing one's own interests but in the context of a constructive sublimation that Renaud Hétier illustrates with three works of children's literature.

Nathanaël Wallenhorst continues this reflection in the seventeenth chapter entitled "Critique, utopia and resistance: three functions of a pedagogy of 'resonance' in the Anthropocene". If resonance (Rosa, 2016) is the counterpart of contemporary acceleration (Rosa, 2010), might it not have something to tell us in this geological epoch of the Anthropocene, which is regularly referred to as "*the great acceleration*" (Steffen *et al.*, 2004, 2015a). The pedagogy of resonance is organized around these three functions of the pedagogue that need to be reactivated and developed in view of the entry into the Anthropocene: a critical function, a utopian function and a function of resistance. Reference to the German sociologist Hartmut Rosa is linked here with that of another German, Andreas Weber, already cited by Christian Arnsperger. The thinking of the philosopher and biologist Andreas Weber reinforces the anchoring of a pedagogy of resonance in nature and allows us to give it a radical tone: it is a question of breaking with this paradigm of modernity of separation between a silent non-human world and a human world that is the only one capable of speech. Allowing the world to speak again then offers the possibility of the emergence of a post-capitalist and post-crusader world.

The eighteenth chapter is by astrophysicist, Pierre Léna, specialist in climate education, David Wilgenbus and glaciologist, Lydie Lescarmontier: "The role of science education in the Anthropocene". What is the function of science education in the Anthropocene, and especially climate change education, given the close relationship of education to temporalities (education that transmits a past in order to read the present and prepare for the future)? The complexity lies in the fact that it is necessary to distinguish between two components of science: research as such and "its sister, technology". The former sheds light on global warming for human societies, while these may have a role to play in mitigating it after having largely caused it. *Firstly*, it is a question of understanding the functioning of the Earth system, which is incredibly complex and subtle (here there are many crossovers between traditional disciplines). *Secondly*, "the search for 'understanding' also involves the trust that it is possible and even necessary to place in what science proposes". It is a question of restoring a relationship of trust that has been damaged by the problem of climate scepticism. *Thirdly*, it is collective action that is required for this education in science in the Anthropocene. For example, it is a matter of allowing the emergence of a decarbonized and sustainable society. *Fourthly*, this collective action generated by education on climate change must allow for a strengthening of solidarity links. The support

⁸ C. Arnsperger, D. Bourg (2017), *Ecologie intégrale - Pour une société permacirculaire*, Paris, PUF.

of teachers is fundamental here and the authors present the mission of the *Office for Climate Education* (OCE) created in 2018 and which they know particularly well.

After the *Office for Climate Education*, philosopher Damien Delorme offers an analysis of ecotopias in the nineteenth chapter: “Ecology and education: the example of ecotopias”. An ecotopia is understood as a place that is engaged in a cultural transition in response to systemic environmental problems; it is a place of creative resistance to contemporary growth-orientated capitalist hegemony. Pacifying our relationship with nature must be one of the founding principles of politics in the Anthropocene, and the relationship of interdependence with our living environment must be taken seriously, the Anthropocene tells us. This implies not only rethinking many of our institutions, “but also a subjective metamorphosis, which makes education a central issue for surviving or coping with the Anthropocene”. Damien Delorme analyses what an ecotopia is, the characteristics of an ecotopian education and how it can play a role in the Anthropocene. Two ecotopias are then presented and analysed. The first is *O.U.R ecovillage*, located on Vancouver Island in Canada and founded in 1999, which includes a farm, a school, living spaces and community sharing. It is a space of welcome and formation of our relationship to the Earth. The second is the *Ecole Pratique de la Nature et des Savoirs* (EPNS) located in the Drôme. Twenty people run this school, which aims to bring about an alliance with nature, from primary school to a range of training courses for adults with a practical or advisory purpose. Within these two ecotopias, education is seen as a true metamorphosis of the self.

This collective exploration of renewed educational foundations in the Anthropocene concludes in the twentieth chapter with political philosopher Cécile Renouard: “Promoting a radical but not marginal educational innovation at the campus de la transition”. The *Transition Campus* was created in 2017 by teacher-researchers, students and professionals to offer high-level training whose purpose is the realization of an ecological and social transition that meets the challenges of the Anthropocene. The militant aim of this project is clear: “Can the *Transition Campus* contribute to generating a new way of relating to the world among those who feed unsustainable and deadly economic models and lifestyles?” The first objective is to strengthen both intellectual and existential awareness of the type of desirable common world we wish to bring about. The idea is to bring out a shared ethical horizon, the forms of which will then clearly be diverse. The second objective concerns the concrete means of implementing this shared horizon. Here it is a question of confronting the structural contradictions of the Paris climate agreements or the UN Sustainable Development Goals (for example, between the growth of GDP in all countries and clean energy for all). Cécile Renouard, who is directly involved in the *Transition Campus*, looks at this project from three angles: that of everyday life and the usual ways of doing things, that of the future we hope for, and that of the transitions to be made. This raises the question which is fundamental to the ecological and social transition: are the planned innovations part of a profound renewal of the world or is the action mainly conducted so that nothing changes?

May the collective thoughts presented in this book be a small contribution to the vast task of making anthropological changes that will allow our “good” Earth to be as hospitable as possible for future generations.

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