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Serres on Education

van der Tuin, Iris; Zuurmond, Anouk

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Document Version

Publisher's PDF, also known as Version of record

Publication date:

2021

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

van der Tuin, I., & Zuurmond, A. (2021). *Serres on Education*. William Temple Foundation.

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SERRES ON EDUCATION

Iris van der Tuin and Anouk Zuurmond

**TEMPLE CONTINENTAL
PHILOSOPHERS FOR OUR TIME**



Serres on Education

Iris van der Tuin and Anouk Zuurmond

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Philosophers for our Time, Book 4

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Authors

Iris van der Tuin is Professor of Theory of Cultural Inquiry in the department of Philosophy and Religious Studies at Utrecht University, where she is also university-wide Dean for Interdisciplinary Education. Iris was trained as a feminist epistemologist and works at the intersection of the Philosophies of Science and the Humanities (including Science and Technology Studies), Cultural Theory, and the critical and creative practices of Cultural Inquiry. She is also interested in the Scholarship of Interdisciplinary Teaching and Learning (SoITL).

Anouk Zuurmond is assistant professor at the University of Groningen, where she coordinates the mastertrack *Ethics of Education*. She has a background in Literature and Philosophy. She worked as a teacher educator at the HU Utrecht University of Applied Sciences and received a PhD in the Humanities at the University of Amsterdam. As an assistant professor at the department of Pedagogical Sciences in Groningen, she is working in the field of philosophy of education and has published on Hannah Arendt's philosophy and its value for educational discussions. She is currently involved in a research project on critical thinking and citizenship in vocational education.

Acknowledgements

We wish to thank our editor and assistant editor, Tim Howles and Tim Middleton, for inviting us to write this text and for carefully preparing the manuscript for publication. We thank the editing company Bresser-Chapple for meticulously proofreading the final draft. Support for hiring Bresser-Chapple was provided by the Creative Humanities Academy of Utrecht University and by the department of Pedagogical Sciences in Groningen. Anouk wishes to thank the research group Education in Culture (University of Groningen) for helpful comments on a preliminary draft of Chapter 1. Iris thanks several cohorts of students in the BA programme Liberal Arts and Sciences (Utrecht University) for critically engaging with Serres' ideas on education in the context of the first-year course Multidisciplinary Project.

Editors' Introduction

Philosophers for Our Time is a new series of short books from the William Temple Foundation that aims to meet two connected needs.

First, within academic theology there is a growing interest in a range of Continental thinkers, prompted, not least, by the so-called 'theological turn' that has taken place in various strands of recent philosophy. And yet, these thinkers can seem to be esoteric, voluminous and sometimes even openly hostile towards religion. *Philosophers for Our Time*, therefore, aims to demystify some of these figures by providing accessible introductions to their work: synthesising their most important ideas, defining their key terms and explaining why their work is relevant to current theology.

Second, our societies and our planet are facing some unprecedented challenges at the present time: from populist politics and technology takeovers to spiritual stagnation and climate catastrophe. And, of course, we all need to address the sort of world that is to follow the coronavirus pandemic, the Me Too movement and the Black Lives Matter campaigns. The philosophers that we consider in this series all have something prescient or profound to say about one or more of these contemporary challenges. As such, each book focusses on an individual thinker and an individual topic in order to offer a focussed account, not just of the philosopher themselves, and what they might mean for theology, but also of what they can contribute to one of the key issues of our generation.

It is our hope that these new resources will encourage you to read some of these philosophers for yourself, as well as setting forth new thinking on some of the most urgent topics of our time.

Tim Howles, Series Editor

Tim Middleton, Assistant Editor

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Introduction

Born in 1930 in France and trained in mathematics and philosophy, Michel Serres taught philosophy and the history of science in Europe and the United States. In France, Serres was not only a university professor but also a member of the *Académie Française* (a prestigious French cultural institution whose members are known as *les immortels*) since 1990, and was later a well-known public intellectual with his own radio show and podcast. In the United States, whilst otherwise managing to maintain relative anonymity, he reached large numbers of students as well as other Californians in the packed lecture theatres of Stanford University. Upon his death in 2019, Serres left an impressive oeuvre of nearly 75 books discussing a wide variety of urgent themes, encompassing diverse disciplines and approaches ranging from the natural sciences through to the humanities and philosophy.

Historical epistemology was one of Serres' main concerns and, therefore, he can perhaps be best characterised as a distinctively *French* philosopher with an interest in the situated study of the conditions—both material and discursive—in which knowledge is produced. This field of study has influenced canonical texts in the philosophy of science such as Thomas S. Kuhn's ([1962/1969] 1996) *The Structure of Scientific Revolutions*, written in 1962 after its American author had visited Europe and come across Continental approaches to the historicisation of knowledge, before travelling across the globe mainly through the popular, translated works of another French thinker born in more-or-less the same year as Serres: Michel Foucault ([1966/1970] 1994). However, such a disciplinary positioning does nothing but reduce Serres' work, and “methodological nationalism” (Beck, 2007) does not much help either. His writing traverses disciplines and methods (Serres, [1991] 1997, pp. 98-99). The Cyprian scholar of education Michalinos Zembylas, with a keen eye for both the centrality of pedagogy in the work of Serres and for the ethics involved, formulates it thus:

A pedagogy of **invention** goes against homogeneity that increases categorisation and linear thinking. Linear thinking leads to absolute order and exclusion of the other; this is, in turn [,] the root of evil [...]. Serres' notion of a new time is linked to how invention works against evil, because his moral philosophy is enacted in a topological space that moves beyond linear boundaries of time. This new time connects people and discourses in a context of inventive freedom and promotes tolerance for the “different”. (Zembylas, 2002b, p. 493, emphasis added)¹

A child of the events that followed the dropping of two atom bombs on the Japanese cities of Hiroshima and Nagasaki in August 1945, Serres explains why so many disciplines and approaches, philosophical and otherwise, must be combined if we are to gain a sufficient understanding of the “present” in one of the books we focus on here, *Le Tiers-Instruit*, published in French in 1991, and then in an English translation under the title *The Troubadour of Knowledge* in 1997:

[...] do not be mistaken: nothing is more difficult than trying to determine of what our present consists. What everyone says of it, far from clarifying it, masks and conceals it. [...] Don't listen to anyone. [...] This is the only means of liberating the present, which is defined precisely by the rare, miraculous, information-saturated meeting of the work with the live, latent forces that condition it, but which only the work can deliver. (p. 96)

Here we see that by not listening to classificationists, focusing instead on the “intra-action” (Barad, 2007) between the work and its conditions, we are able to do justice, not only to understanding how “the work” (whether philosophical or artistic) constructs its own conditions, but also to the intra-action itself, which vibrates with data, information, knowledge, and even—Serres would claim—wisdom.

Another way of characterising Serres' writing is by zooming in on the condition of the work, and therefore knowledge, in a more generic sense and on how we are currently witnessing a new type of knowledge transmission system that informs and impacts both science and culture. This is most explicitly explained in a later book

¹ “Invention” is a keyword in the philosophy of Serres. Keywords are listed in the glossary of terms that can be found immediately after the main text in this booklet. They have been put in **bold** type upon their first appearance in the text.

that deals with education, entitled *Thumbelina: The Culture and Technology of Millennials*—treated here as *The Troubadour of Knowledge*'s companion volume—which was published in English translation in 2015 after its initial publication in French under the title *Petite Poucette* in 2012. In *Thumbelina*, Serres argues that, once upon a time, the body of the knower him- or herself (for example, in the person of “the teacher”) supported knowledge, as if that person were a living library. Subsequently, a general objectification paradigm evolved where knowledge was understood as being supported externally. This paradigm then changed at least three times in history: first, knowledge became supported by rolls or pieces of parchment; then, by printed books; and now, by the Internet (Serres, [2012] 2015, p. 11). The present condition of the work being produced with/in the World Wide Web has two main consequences for the transmission of knowledge in general, and for pedagogical practice in particular. First, knowledge, in addition to its objectification, has now also become *distributed* instead of being concentrated in certain bearers and institutions (libraries, archives etc.). Therefore, knowledge is always accessible and available from nearly any location. Thus, knowledge has become characterised by a certain **disparateness**. One could say that the transmission of knowledge has basically already taken place, and that knowing, teaching, and learning now not only happens in schools, colleges, and universities, but also in other places such as the home or whilst on the move. Second, in the age of the Internet, the speed of knowledge production, its distribution and circulation, has increased exponentially.

Near the beginning of *The Troubadour of Knowledge*, Serres ([1991] 1997) asks: “Perhaps we now prefer the chromaticism of light to its unity, its speed to its clarity?” (p. 43; cf. Bühlmann, 2020). That is to say, he suggests that, today, we may have a preference for offering spectra of insights and for taking them in as fast as we can. This move away from the concentration of knowledge in unified bodies—whether biological or literary—has fundamentally changed our times. Like us, Serres writes, teaches, and lives in this new “algorithmic condition” (Colman et al., 2018) that truly sets the present era apart from previous eras of objectification. This also accounts for differences between Serres’ work and, for instance, the work of the French thinker Jean-François Lyotard ([1979] 1984) who, in *The Postmodern Condition: A Report on Knowledge* is able to reflect on the arrival of ICT in knowledge-intensive institutions, but not on the advent of networked media and machine learning. Serres makes two fundamental observations about this new era in *The Troubadour of Knowledge*. First, that the interests of students have now changed:

Questioningly, I teach my granddaughters a bonhomie whose nobility still governs me, but, in return, they teach me the recent developments and achievements of science and technology. One kind of knowledge, maturing, is like good wine, whereas the second kind, new, unceasingly becomes greener. Youthful Nobel Prize winners in science next to patriarchs decorated for literature. (Serres, [1991] 1997, p. 55)

The technical term “chromaticism” must thus be taken very seriously as a call to qualify ourselves in the natural sciences if we wish to understand our culture. Second, he also argues that, despite the “becoming greener” of the interests of the current youth, and despite the fact that they grow up with keyboards instead of pens (Serres, [1991] 1997, p. 16), we must send them out into the world of the arts, the crafts, and the trading professions: “Before teaching children the console or the keyboard give them something to weave or knit” (Serres, [1991] 1997, p. 20). The complex dynamics of students foreshadowing new disciplines and approaches, and of the teacher being a humble guide in this process, provides our entry point to the topic of this booklet: Michel Serres and education.

Chapter 1

Pedagogical Position

Just as *Thumbelina* engages with the issue of education, Serres' earlier book *The Troubadour of Knowledge*—which he summarised as a work “about rivers, mountains, love, youth, [and] education” (Serres with Latour, [1990] 1995, p. 168)—is also an important point of reference for his pedagogical thinking. *The Troubadour of Knowledge* can be read as a story of birth and rebirth. The first hours of our birth present us already with “four major pedagogical tests or exposures”: “the break up of the body into parts, the expulsion to the outside, the need to choose a sideways and paradoxical path, finally the passage through the third place” (Serres, [1991] 1997, p. 11). These four challenges or exposures provide the framework in which we can position the pedagogical ideas of Serres: right at the beginning there is a disintegration of the maternal body; the push towards the “unbreathable cold of the outside” (p. 11); towards a path that is narrow and unpredicted; ultimately through a passage that presents both life and death simultaneously as the risk of suffocation looms. The fact that we have been born, that we experienced these four pedagogical exposures, means, according to Serres, that “everyone, like me, [...] can adapt, learn” (p. 11).

With this image, Serres underlines how his work taps into traditional pedagogical ideas, and yet at the same time re-imagines these in order to understand what education should entail in a contemporary setting. Serres' conclusion that anyone can learn calls to mind the fundamental assumption of *Bildsamkeit*: the ability of anyone to learn as a constitutive principle or necessary precondition in pedagogical thinking (Benner, 1987). Yet, Serres adds the notion of “adaptability” to this; an important addition to which we return in the second chapter where we will address interdis-

ciplinary practice. Similarly, the juxtaposition of childbirth and education suggests a Socratic idea of wisdom being born with the help of the philosopher-as-midwife. However, Serres ([1991] 1997) utilises the latter image not only to emphasise the idea of conceptual growth in the process of education—finding out that “the experience of death throes could suddenly equal the very article of living” (p. 11)—but also the idea of bodily change that is inherent in this process. *The Troubadour of Knowledge* indeed opens with an expression of gratitude for his late schoolmaster, who turned him into a “thwarted lefthander” (p. 13): someone who turns to his left hand for certain practical tasks, but has learnt how to use his right hand for writing and eating. A “crossbred body”, or “lateral hermaphrodite”: Serres hints that the ambidextrous being is more fulfilled than others, who “live in a world only half explored” (p. 13).

Serres draws upon yet another classical image to convey his ideas on pedagogy: that of the **voyage**. He proposes a return to the initial meaning of “pedagogy”, namely “the voyage of children”. The “pedagogue” emerged historically as an enslaved person who brought children to school, and this literal sense reminds us, according to Serres, that “[a]ll learning demands this voyage with the other toward alterity. During this passage, lots of things change” (Serres, [1991] 1997, p. 48). Even though this original meaning of the word pedagogue has been taken over by our modern interpretation—Serres is amused by our language, which has been capable of transforming the enslaved person into a master, the trip into school itself, and emigration into instruction—he calls on his readers to let the initial idea of a pedagogue resonate in our current understanding. There is no learning without a voyage, that is, without expulsion from the familiar. Children therefore need to be “seduced” by teachers to go elsewhere, and “[a]bove all: never take the easy road, swim the river instead” (p. 8). Serres thus enriches the idea of a pedagogical voyage by comparing it to crossing a river, but not in a plain and simple manner, for here the crossing of a river is compared to a set of designed learning activities that will result in the safe arrival of the swimmer at the intended learning outcome, namely the opposite bank. In this instance, the river becomes just an instrument, or a hurdle to overcome. For Serres, however, it is precisely *in* the act of swimming that the swimmer is transformed. The axis or threshold in the middle of the river provides a sense of disorientation, as all reference points disappear. Serres ([1991] 1997) described this sensation as follows:

The real passage occurs in the middle. Whatever direction determined by the swim, the ground lies dozens or hundreds of yards below the belly or miles behind and ahead. [...] At first, the body relativizes direction:

Neither left nor right is important as long as I can hold my ground, it says. But in the middle of the crossing, even the ground is missing; any sense of belonging, of support is gone. (p. 5)

The image of the journey as a pedagogical process is thus turned around to emphasise the importance of the voyage instead of the destination, and the loss of direction instead of finding one's way.

Both images—that of the process of birth and the voyage—aim to convey how pedagogy revolves around the notion of a “third place” and begets what Serres calls a **third-instructed**. In crossing an impetuous river, according to Serres ([1991] 1997), a “third place” is discovered: a place between the shores of culture and science, or the axis of “rational universality and painful singularity” (p. 70). It is this third place where everything is in flux—where there is no past, nor future, nor direction—“bringing up” a third person (or “third-instructed”):

The third-instructed owes his upbringing, his instruction, and his education—in all, his engendering—to reason, a brilliant sun that commands scientific knowledge as much as the second reason, *the same one certainly*, but burning in the second focus, which comes not only from what we think, but from what we suffer. This latter reason cannot be learned without cultures, myths, arts, religions, tales, and contracts. (Serres ([1991] 1997, p. 71, emphasis in original)

Already, within this quotation, a glimpse of Serres' ideas on pedagogy for a new generation emerges. Students are invited to enter a turbulent river of learning between the shores of both culture and science, without an established outcome, to emerge during the process as transformed in body and soul, or as “third-instructed”. For this reason, Serres' work provides inspiration for educators engaging interdisciplinary approaches in their teaching practices.

In *The Troubadour of Knowledge*, Serres invites us to think about pedagogy in, at first sight, traditional metaphors, which are adapted to convey his specific understanding of the processes of upbringing, instruction, and education: the bodily transformation, the expulsion towards the other, the crossing of the river where one loses all sense of direction. However, compared to more traditional uses of these pedagogical images, Serres re-creates these metaphors. In fact, *The Troubadour of Knowledge* can also be read as a *performance* of the processes of a birth and a journey, revealing a fundamental characteristic of his writing in general. Just as Serres' texts have been

described as “mimicking” philosophy in the making, resembling more an expedition than a scientific paper or a work of philosophy (Paulson, 2005, p. 33), so also readers of *The Troubadour of Knowledge* are invited to enter a pedagogical voyage, expelled from the safety of their homes or academic disciplines, passing through a third place in order to be “brought up” as a third person, changed by the itinerary that is the text itself. Whilst Serres is our guide or “pedagogue” on this journey, he is one with multiple voices, traversing, as indicated earlier, different disciplines: the voice of a storyteller, of a historian, of a scientist, of a philosopher, and unmistakably also of a teacher. Serres ([1991] 1997) states that the third-instructed “is born in this book” (p. 45), which then takes place on the final page with the words: “Reborn, he knows, he takes pity. Finally, he can teach” (p. 166). The final paragraphs of *The Troubadour of Knowledge* therefore announce the emergence of a new time, not populated with “seekers”, but with “finders” or “troubadours” (p. 104). Here, Serres employs the etymological root of the word “troubadour” (indicating a “finding” or an “inventing”) to characterise these new students and teachers—a generation Serres then explores in his later essay *Thumbelina*.

The arrival of a new age is instigated by the democratisation of knowledge, first objectified through the emergence of the printing press and now distributed via the Internet. Not only does this have repercussions for the body of the pedagogue—that which used to be “a living library” (Serres, [2012] 2015, p. 11)—but also for the body of the student, now named Thumbelina and dispersed all over the world, no longer inhabiting the same space, the neurological setup of which is nothing like to those who were brought up with books, her hands now performing in ways that are far beyond the reach of older people. As far as Serres is concerned, many of Thumbelina’s teachers have not yet asked themselves the opening question of the essay *Thumbelina*, namely, “Who, today, is enrolling in our schools, colleges [,] and universities?” (p. 1), thus remaining unaware of the emergence of a generation with these new characteristics and abilities. Thumbelina can consult freely available information online and become as knowledgeable as any teacher, any time. Previous students were like “Entranced Children” (p. 32), with no other option than to sit still and quietly listen to the voice of the teacher. No longer: Thumbelina has been “reduced to silence for almost three millennia” (p. 28) and is now disruptive in class, producing a never-ending **chatter** and refusing the hierarchical setting of the classroom that forces her body in the passive posture of a passenger who is being driven around in a vehicle with a professor at the steering wheel. Indeed, the whole campus has become problematic. It is no coincidence that the word “campus” refers

to a camp set up by Roman soldiers during battles. Serres ([1991] 1997) states that young people know full well that “there is no difference between the purely animal or hierarchical customs of the playground, military tactics, and academic conduct” (p. 134).

The tradition of critical pedagogy clearly resonates in Serres’ ([1991] 1997) assessment of educational institutes as places of oppression and disciplinary practices when he writes that “we lack [...] an intellectual sphere free of all relations of dominance”: “A thousand certainties, rare moments of invention” (p. 136). Both Serres and critical pedagogues such as Austria-born Ivan Illich, active on a global scale, advocate the idea that the most interesting learning opportunities present themselves outside the walls of educational institutes. However, it is important to underline the fundamental differences in the assumptions they make regarding education. Critical pedagogy aims towards a “deschooling [of] society” (Illich, 1971) in an attempt to undermine the mechanisms of oppression and continuing inequality that is inherent in our school system. As such, it can be characterised, according to the Dutch educational philosopher Gert Biesta (2012), as a “pedagogy of the public”, aimed at generating a critical awareness, with “the world as a giant adult education class in which educational agents perform the role of facilitator” (p. 692). This form of “collective political learning” (p. 692) is difficult to square with the Serresian pedagogical voyage, which “often bifurcates in directions that the teacher could not have planned in advance” (Moser, 2016, p. 184). Furthermore, in its effort to demythologise the teacher, critical pedagogy of the sort espoused by Illich assumes that schools might be replaced by networks of people gathered around a shared interest and any instructor that is skilled or knowledgeable in this specific topic. Serres’ pedagogical thinking, however, dismisses neither the role of the teacher, nor the role of schools. Rather, the pedagogical voyage assumes “the supervision of a guide” (Serres, [1991] 1997, p. 8). Especially in this digital age, Serres is acutely aware that the Internet is a source of misinformation, extremist agendas, and disturbing business models. It is precisely such online pitfalls that the teacher might help the student avoid. Indeed, Serres cautions educators and students alike of the dangers of conflating data, information, and knowledge—a guide (teacher) is absolutely necessary to convert the “deluge of information in which the modern subject is now engulfed” into meaningful insights (Moser, 2016, p. 187). Finally, one can argue that Serres’ main concern is not what we might perceive as “training” in the tradition of critical pedagogy, but a more fundamental pedagogical issue. The current advent of new technology implores us

to restore intergenerational communication and rethink pedagogy in an atmosphere of respectful lovingness. This is an important responsibility we hold towards future generations.

Finally, by positioning Serres in the field of pedagogy, it should be noted that his thinking diverges substantially from those who understand pedagogy as the transference of norms and values as distinct from the transmission of knowledge and skills. Rather, Serres ([1991] 1997) embraces a broad notion of pedagogy, encompassing upbringing, instruction, and education (p. 71). This notion can be aligned with the plea made by educational philosophers Gert Biesta and Siebren Miedema (2002) for a “transformative conception of education” in which “the central concept is not that of transmission but that of transformation” (p. 180): “We need to acknowledge that the task of the teacher and the school is first and foremost a pedagogical task, as it is concerned with the whole person, the whole sense of identity of the student” (p. 181). This pedagogical task thus needs to be taken up whilst being aware that a rupture caused by technological developments invites us to re-think fundamental pedagogical categories, as the spatio-temporal framework crumbles in the advent of the contemporary. Serres’ metaphors of the river and the “third place” indicate how his educational ideas are questioning the assumptions underpinning most pedagogical thinking: that education takes place within a specific time frame and in a designated space. Flemish educational philosophers Jan Masschelein and Maarten Simons conceptualise this as *scholè*, or “a time/space where something can be and can become present and where we are in its presence” (Masschelein, 2011, p. 533). By contrast, Serres’ river is “omnidirectional”; the turbulence does not indicate any smooth transition between different places, and in its centre all sense of time, space, and other points of reference disappear. Masschelein and Simons perceive a challenge similar to Serres’ pedagogical thinking in this time of technological rupture, raising the question:

[...] whether and how *scholè* (as disclosure and communization), is to be made or sustained in a time of information and communication technologies, in a time of digital technologisation of the wor(l)d, in a time which is no longer that of modernization, progress or development, but of globalization and the instant. (Masschelein, 2011, p. 534)

Even though the interdisciplinary scholar Niran Abbas (2005) rightly argues that “[o]ne does not read Michel Serres for answers, for certainties, or for conclusions” (p. 7), *Thumbelina* and *The Troubadour of Knowledge* do provide us with a dynamic to

take up this challenge: by working synthetically, jumping through time and space— with a final injunction to “keep going” and to “be strong” (Serres, [2012] 2015, p. 26).

Chapter 2

Interdisciplinary Practice

What is needed, then, is a particular attitude on the part of all those active within academic and educational institutions, acknowledging that in this regard “many of the scientists and intellectuals [...] lag behind” (Weaver, 2021b, p. 7): “schools are not prepared for the algorithmic world of data, but the young are” (p. 8, n. 2). What, then, do we teach the young, given both this gap in knowledge and praxis, and the necessity to keep on teaching and “moving along”? Another interdisciplinary scholar, Gray Kochhar-Lindgren (2019), characterises the pedagogical work of Serres as “a parasite on the body of learning, a virus coursing through the circuits of the motherboards and the boardrooms” (p. 109). If this is so, perhaps the best we can do is follow its course.

Serres suggests we teach students, and retrain ourselves, both to go to, and to leave, the library. In *The Troubadour of Knowledge*, Serres ([1991] 1997) states:

Certainly, one must go to libraries; it is assuredly good to make oneself learned. Study, work, something will always come of it. And after? For there to be an after, I mean some kind of future that goes beyond a copy, leave the library to run in the fresh air; if you remain inside, you will never write anything but books made from books. That knowledge, excellent, contributes to instruction, but the goal of the other kind is something other than itself. Outside, you can try your luck. (p. 58)

In order both to catch up with the young and to prepare them, and ourselves, properly for life in this day and age, as well as for our common future, we need wordy book knowledge as well as worldly experiences. This double suggestion for schools, colleges, and universities to be experimental in their courses and curricula neatly aligns

with a pedagogical text written by the Canadian media theorist Marshall McLuhan, who, in *City as Classroom: Understanding Language and Media* from 1977 (a volume co-authored with educator Kathryn Hutchon and, significantly, with McLuhan's own son Eric), also sends students (and their teachers) outside the classroom under the significant chapter title "What's in a School?". Situated in a time of burgeoning electronic media, instant communication, and the "information explosion" (McLuhan et al., 1977, p. 165, p. 170), *City as Classroom* also suggests that we need to learn more than that which can be copied from books, because the dynamic and fast-changing spectra of insights given to us by new technology constitute a different era, thus also impacting what we can do in this world. Chromaticism is both the condition of, and conditions, what students can do after graduation: "The field of electronics, with its instant information, seems already to have created the possibility of pursuing several different careers in one lifetime" (p. 172). Borrowing a term from the French philosopher Gilles Deleuze and his co-author Félix Guattari ([1980] 1987), this is a world of "becomings". In the words of Serres: "All that we have is education to make us *adaptably* prepared for the future" (Serres with Latour, 1995, p. 184, emphasis added).

The question remains: What happens in educational settings when one learns everything and when one learns to adapt? What kind of "multiple journey" (Serres, [1991] 1997, p. 73) are we looking for; or what does it mean to work both with science and with a bookish culture, as well as to dynamically "[l]ive, taste, leave, do, play, [not] copy" (p. 80)? In *Thumbelina*, Serres answers these questions by focusing on interdisciplinarity. Today the combined interdisciplinary approach is indeed growing in prominence when compared to the academic past and again, with striking clarity, Serres ([2012] 2015) turns to the metaphorical river:

A river, for example, was dispersed in the scattered basins of geography, geology, geophysics, hydrodynamics, the crystallography of alluvia, the biology of fish, halieutics, and climatology, not to mention the agronomy of irrigated plains, the history of flooded cities, the rivalry between riverside residents, and then the bridge, the gondolier's barcarole, and even Apollinaire's *Le Pont Mirabeau*. Our easy access to knowledge—by bringing together this debris, merging and integrating it, restoring from these scattered limbs the living body of the current—allows us, finally, to inhabit the river in full. (p. 37)

Serres' translator William Paulson (2005) states that this habitation implies a "synthetic vocation" (p. 31) enabling a form of knowledge production that differentiates from the localised knowledges embraced by postmodernists. Paulson explains that Serres' synthesis does not consist of the disembodied and dis-embedded universalism that postmodern epistemology wanted to leave behind. Rather, Serres argues for making philosophical choices (rather than "anything and everything goes") that synthesise hard scientific facts alongside soft dream worlds in narrative and real-life journeys. About our preferred dealings with the books of culture, Serres ([1991] 1997) states that "*only philosophy can go deep enough to show that literature goes still deeper than philosophy*" (p. 65, emphasis in original). About all dealings combined, he states:

It is not worth entering philosophy as a youth if one does not have the hope, project, or dream of one day attempting synthesis. [...] Doubtless this is the only risk adventure to be had, here and today, in a space held by uniform powers, so as to escape them, only this risk to be run, so as to see open air. (Serres, quoted in Paulson, 2005, pp. 30-31)

The philosophically informed, synthetic vocation of Thumbelina, her male counterpart Tom Thumb, and all of us, can be best understood with reference to what we currently call "interdisciplinary studies" (Repko & Szostak, 2021) and what features more generally as "interdisciplinarity" in Serres' work (albeit not explicitly so in *The Troubadour of Knowledge* or *Thumbelina*).

In another work from the early 1990s, *Conversations on Science, Culture, and Time*, a dialogue between Serres and the French anthropologist of science Bruno Latour, Serres states that "[t]he space *between*—that of conjunctions, the interdisciplinary ground—is still very much unexplored" (Serres with Latour, [1990] 1995, p. 70, emphasis in original). This is because, when working synthetically, one moves quickly, thus jumping rapidly through time (by contrast with the discipline of history, which only copies and displaces the same "elsewhen"; cf. Haraway, 1997, p. 16) and space (ignoring the disciplines, which are a form of dominating knowledge production anyway; see Serres, [1991] 1997, p. 121). Using the idea of a "comparative methodology" for making connections between the natural and the human sciences, Serres uses the electricity metaphor again when describing and, in fact, *performing* the interdisciplinary process in the same stroke: "Comparativism proceeds by short circuits and, as we see in electricity, this produces dazzling sparks" (Serres with Latour, [1990]

1995, p. 69). In *The Troubadour of Knowledge*, Serres ([1991] 1997) calls this embodied and embedded universalism an “integrative practice”, thus providing an early hint of the booming corpus of literature in interdisciplinary studies that we now see:

Universal means what is unique yet versed in all directions. Infinity enters the body of the one who, for a long time, crosses a rather dangerous and large river in order to know those regions where, as on the high seas, whatever direction one adopts or decides, reference points lie equally far. From then on, the solitary soul, wandering without belonging, can *receive and integrate* everything: all directions are equal. (p. 7, emphasis added)

We must think of integration as a “work[ing] at the intersection or the interference of many other disciplines and, sometimes, of almost all of them” (p. xviii; cf. p. 19). One does this work from a receptive position, not dominating but rather holding back, acting like “a spirit that, simultaneously, makes or follows the legal eccentricity of the world and is sown, multiplied, in the universe” (p. 70). This posture “avoids neither the center nor the periphery” (p. 71) and this tentacular practice, as it were, finds “the secret of knowledge: it functions like the world” (p. 71).

Conclusion

The advent of a new age is announced, like any great change in history, “like a subtle breath of wind, softly, without great fanfare” (Serres, [1991] 1997, p. 105). The work of Michel Serres has sometimes been embraced with boisterous marching bands, condemning the ills of current academic practices. However, Serres ([2012] 2015) seeks a humbler attitude: “Those of us who are Speaking Teachers must learn how to listen” (p. 30). The challenge for educators today is to guide students not only to, but also through, the river, which means that they (we) must leave their (our) comfortable offices as well. It is significant that Serres wants teachers and students today to do our learning in rivers, not in cities, just as the McLuhans noted in the 1970s. This age does not function via the “city as its classroom”, but invites us to enter “natureculture as its classroom” as a way to “invent the conditions of invention” (Zembylas, 2002a, p. 487). Rivers range from potentially polluted canals in cityscapes to little streams somewhere in a landscape of mountains and forests. Immersing ourselves in the hybridity of “naturecultures” (Haraway, 2003; Latour, [1991] 1993) we lose our individuality and this humble anonymity—a collective of teachers, students, and non-human others—enables us to listen, perceive, think, and act for the future that is now.

Glossary

Chatter/noise: Noise, of which chatter is a subset, is omnipresent in the oeuvre of Michel Serres. It represents omnipresence itself on the descriptive level and even a form of unavoidability on the level of ethical reflection. The background to all this is generational. Serres' interconnected ontological, epistemological, and ethical compasses have been formed by the events of 1945; thus, he comments: "I belong to the generation that questions scientism. At the time one could not work in physics without having been deafened by the universal noise of Hiroshima" (Serres with Latour, [1990] 1995, p. 16). Contemporary cultural theorist Rick Dolphijn (2019) clarifies this concept by stating that an embrace of noise and chatter starts with the defeat of the neat categorisations of science versus culture, and their supposed products of purity, linearity, and predictability: "Whereas May '68 can be considered the birth of contemporary critical theory, Hiroshima, as Serres reads it, offers us theories of affirmation without a limit" (p. 136). Having affirmed noise in the natural sciences and the humanities, and in the arts, communication, and ecology from the beginning, it must have been easy for Serres ([2012] 2015) to embrace both "the mini-tsunami of chatter that has invaded our classrooms and lecture halls" (p. 54-55) and "the new noise" (p. 54) that is produced with/in the World Wide Web by today's young people.

Disparateness: Serres is not a big fan of classified order. Rather, he embraces labyrinthine chaos. The notion of "class", he says in *Thumbelina*, comes from the army; it "originally signified the division of an army into tight rows" (Serres, [2012] 2015, p. 39). As a philosopher who has military training (via the French Naval Academy), who also argues against the so-called "military-industrial-academic complex" (Giroux, 2007; see also Serres, [1991] 1997, p. 134-135; Weaver, 2021a), Serres ([2012] 2015) prefers "[t]he space of circulation, a diffuse orality, free movements,

the end of classified classes, disparate distributions, the serendipity of invention, the speed of light, the novelty of both subjects and objects, the search for a new reason” (p. 43). Why? In *Thumbelina*, he writes:

The ill-sorted or the disparate has virtues of its own, of which reason is unaware. Order, though practical and efficient, can imprison. [...] An atmosphere penetrated with disorder, by contrast, is like an apparatus that has a certain play in it, and it is precisely this play that provokes invention. (p. 40, emphasis in original)

Invention: Serres’ is a philosophy and pedagogy of invention. In *Conversations on Science, Culture, and Time*, he explains to Bruno Latour that he took an interest in invention early on, while watching his mathematics teachers solve algebraic puzzles during his first degree at the Naval Academy: “Their style has remained with me as an ideal, in which rigorous truth is accompanied by beauty—rapid, elegant, even dazzling demonstrations, scorn for slow mediocrity, anger at recopying and recitation, esteem only for invention” (Serres with Latour, [1990] 1995, p. 7). In his extensive oeuvre, invention is a form of creative interdisciplinary analysis that is differentiated from forms of repetitive critique that follow and build upon disciplinary norms. For Serres, that form of critique, governed by negation as its logical operator, is not a form of invention: “An idea opposed to another idea is always the same idea, albeit affected by the negative sign. The more you oppose one another, the more you remain in the same framework of thought” (Serres with Latour, [1990] 1995, p. 81). In other words: “To think by negation is not to think...” (Weaver, 2021b, p. 3). Serres’ ([1977] 2000) alternative is formulated in terms of a logic of affirmation or even a “swerving”. The mantra goes like this: “I think therefore I invent, I invent therefore I think” (Serres, [1991] 1997, p. 93). This mantra applies not only to philosophy, but also to pedagogy. In *Thumbelina*, Serres ([2012] 2015) claims that “[t]he learning process, which has fallen into the box, has left us the incandescent joy of invention” (p. 19).

Third-instructed: Serres, who once was a teacher of logic, does not respect the law or principle of the “excluded middle” that states that for every proposition, either this proposition or its negation is true. As such, the middle, mixed, or “third” option has particular significance in his work, and especially so in relation to pedagogy. After all, Serres’ first book on pedagogy was titled *Le Tiers-Instruit* in French: the “third-instructed” or the instructed third. For students today, a new curriculum has to be invented by wise teachers: “Wisdom requires us to invent a third curriculum, which

will weave the warp of the rediscovered humanities to the woof of expert exactitude” (Serres with Latour, [1990] 1995, p. 184). The embryonic stages of this can be discerned in the eighteenth-century “juridical and medical faculties [that] gave birth to a third subject, who was one of the ancestors of Thumbelina” (Serres, [2012] 2015, p. 69). Both teacher and student emerge transformed. This is just what happens, says Serres ([1991] 1997), after reading a radically interdisciplinary volume such as his book on pedagogy: “[T]he portrait of the third-instructed, me in first person, you, completely other, in second, suddenly abound and engender one, two, ten models, as many thirds as one could want” (p. 47).

Voyage: Both thinking itself and the learning process are voyages, in Serres’ parlance and in his deeply felt understanding. As a thinker, Serres is always on the metaphorical and literal road towards something new or unexpected: “Assembling, accumulating facts, the voyage into the totality of knowledge and experiences—these admittedly have their difficulties, depending on the content, but they also presuppose a distancing on the part of the person doing it” (Serres with Latour, [1990] 1995, pp. 89-90). This distancing is a distancing from disciplines in the natural and the human sciences, and from schools of thought and “trends” in philosophy. Disciplines, schools, and trends prevent the totality from being seen; one only gets to see what has already been remarked by someone else and what can, therefore, be reproduced or copied. Serres understands the voyage as a Lucretian “*clinamen*”, a “swerve” (pp. 55-56). What is this swerve? “The *clinamen* should not be treated as an occasional ‘chance’ event—that is, as a ‘rogue’ cause that does not obey the law—but rather as the theoretical expression of an irreducible complexity in the order of events” (Serres, [1977] 2000, p. xii). We need the figuration of the *clinamen* in order not to think of thinking and learning as in any way pure, linear, and predictable.

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