

make them fit with the predominant classification system.

A third theme is that of the silent bodies that build their voice organizing in associations contributing to knowledge production and sharing, recalcitrant bodies that do not fit in classification schemes that build their legitimacy in the arena of medical experts. The last chapter of the book is dedicated to Italian DSD associations and to the analysis of their role as they gain respect and participate side by side with healthcare professionals. STS scholars will find significant resemblance with the body of work on patients associations and, in particular, with the notion of “evidence based activism” (Rabeharisoa et al. 2013) through which patients’ expert knowledge is transformed into credentialed knowledge.

These three themes are not just what might interest the STS community but also some topics we hope the author will develop in forthcoming publications.

Let us take the last theme as an example. The book focuses only on Italian associations but their relevance could emerge more clearly if compared more extensively with international ones. Another theme that could be further developed are the narratives of the patients which, presented in the frame of medical congresses, lose part of their relevance becoming somehow marginal. In more general terms, while we found the historical part of the work accurate, the last sections of the book does no justice to a 5-years ethnographic work. And we look forward reading more about it.

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Patrick Forterre, Louis d'Hendecourt, Christophe Malaterre et Marie-Christine Maurel

Da l'inerte al vivente. Una enquête scientifica e filosofica [From inert to living: a scientific and philosophical inquiry]. Paris: La ville brûle Éditions, 2013, pp. 256

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This book is quite original in its format. Published in French in the Series “Collection 360” of the publisher “La ville brûle”, it explores the multidisciplinary debate on the question of the origin of life, which is both a philosophical and a scientific question. The general aim of this Series, directed by the journalist Sylvestre Huet, is to offer a plural insight on various issues related to science and society through the direct confrontation of researchers in the natural and the human sciences. More precisely, this Series relies on the idea that scientific questions concern both knowledge and society, and are also a matter of economical and political power. Thus, by offering and crossing different perspectives on a given issue, it aims at analysing the way science, man, and society work together and influence each other.

The director of “Collection 360”, Sylvestre Huet, directly participates to the book reviewed here: he conducts a very successful interview of the invited researchers and succeeds in highlighting the way their thoughts and questions are connected and articulated. To address the question of the origin of life, i.e., the passage from the inert matter to the living, he invites four researchers: the molecular biologist Patrick Forterre, the astrophysicist Louis d'Hendecourt, the philosopher of science Christophe Malaterre, and the biologist and biochemist Marie-Christine Maurel. The diversity of disciplinary affiliations convened for the discussion is the direct manifestation of the interdisciplinary character of the issue at stake: the origin of life is an age-old problem, having received mythological or religious answers in ancient times, which cannot hope today to be tackled in the domain of just one discipline (whether it be biology, chemistry, astrophysics, philosophy, etc.).

The structure of the book is particularly well-designed in order to help the reader to gradually get accustomed to the debate on the origin of life. In this respect, the book is suited to a varied and wide public: some sections are rather technical, but the issues discussed and the general message are easily accessible to any kind of reader. A section composed of short biographies of the four authors opens the book (pp. 11–23). Each of them speaks in the first person about his/her own career: this is a valuable way to provide to the general public, especially young scholars, an idea of the reason why they wanted to get involved in scientific research, of how they became scientists or philosophers, and to give a flavour of the everyday life of people doing science or philosophy as a job. In the introductory section, the authors talk again about their intellectual and professional journey and extensively say why they have been interested in the issue of the origin of life (pp. 25–37). This is also the place for giving a historical overview of the way this issue has been addressed, from its emergence as a scientific question at the end of the XVIIIth century to current debates in various disciplines (organic chemistry, astrochemistry, molecular biology, synthetic biology, etc.) on prebiotic chemistry, its features, and its role in the evolution of living entities.

The two wider sections – “The scientific debate” (pp. 39–147) and

“The societal debate” (pp. 149–189) – constitute the core of the book. The first is somewhat technical dealing with debates over the emergence of life from prebiotic chemistry, the nature of chemical evolution and its irreversibility, and various hypotheses about the primitive RNA world, the origin of the genetic code, the evolution of cells and of LUCA (i.e., the last universal common ancestor of all living organisms). The second deals with the management of interdisciplinary research about the origin of life, its features and limits, and on the potential relevance of on-going projects such as the exploration of Mars or other planets looking for water. The book finishes with a short but effective conclusion, resuming the main points of the scientific debate and its future challenges (pp. 191–196). An appendix, a glossary, and reading lists suggested by the authors usefully complete the volume (pp. 199–223). I think it is worth reading this book because it offers a panoramic view on the research question of the origin of life: it is a non-partisan introduction addressing multiple aspects of this interdisciplinary issue from diverse points of view.

Let us focus on the core of the book, which covers in depth the main issues researchers have to deal with when asking the question of the origin of life. In the section “The scientific debate”, the four authors discuss in details the main historical and concurrent hypotheses about the origin of life: they raise the question of the source of organic matter on Earth, which could be exogenous (delivered by a meteorite) or endogenous (present below the terrestrial magma); they introduce the controversy about whether chemical evolution preceding life was Darwinian or not; they exchange about the irreversibility of the evolutionary process at the origin of life and on the contingency of its final current result; among other research topics, they also discuss in details the hypothesis of an original RNA world. Throughout all these discussions, two more general issues, respectively a conceptual and a methodological one, are particularly worth of consideration: the issue of the definition of life, and the issue of the method used to address the question of the origin of life. Let us look at each of them.

As the philosopher of science Christophe Malaterre notices at the beginning of the book (p. 26), the question of the origin of life, to get an answer, requires that we know what life is. But the molecular biologist Patrick Forterre replies that most of his colleagues are not interested in defining life (pp. 44–45): it is a question for philosophers; biologists rather prefer to be silent about it and assume that biological entities and processes are living and the result of a historical evolutionary process on Earth which is still going on. This divergence of interests, I maintain, points not only to the difference between philosophy of science and science but also, and mostly, to the kind of relationship between the two. Is philosophical research useful for scientific practice when it consists in clarifying and defining concepts used in science (e.g., life)? In the specific case of the origin of life issue, what would biologists gain in adopting one particular definition of life provided by philosophers of biology? Would

this improve their work or, on the contrary, limit the potential scope and development of their research? The book partly consists in a dialogue between philosophy and science, but does not clearly address all these questions. A deeper reflexion is needed, not only on the relationship between philosophy of science and science, but also and primarily on what philosophy of science is (philosophy of biology, in this case), and even should be: is it different in nature with respect to science or does it produce the same kind of knowledge than science? More explicitly, does philosophy of science consist in a meta-reflection on scientific practice (its epistemic standards and methods as well as its ethical and societal implications)? Or rather, is it involved in the same fight as science, trying to solve scientific puzzles in a more conceptual and theoretical way? These two ways of conceiving philosophy of science are not necessarily incompatible, can coexist, and are indeed both represented in the international community of philosophers of science, in Europe as well as elsewhere. To adhere to either of them is a matter of intellectual attitude about the very nature and aim of the philosophical work.

The other important issue emerging from this section is methodological. As the biologist Patrick Forterre says again and again throughout the book, two approaches are possible in order to investigate the origin of life (e.g., see p. 69): the bottom-up and the top-down approaches. The first consists in trying to recreate the initial conditions when Earth formed in order to find out how organic materials could have accumulated and formed molecular complexity. The second approach starts from the study of currently living organisms and looks for fossils which could allow to go backward into the past. As biologist, not surprisingly, Forterre adheres to this second approach. Actually, the bottom-up and the top-down approaches characterize two different sets of disciplines represented in the book: astrochemistry and prebiotic chemistry on the one hand; biological disciplines on the other. Such a striking methodological difference comes from the specific research objects of these disciplines: the chemistry of inert prebiotic matter and living organisms, respectively. It is also due to the emphasis biologists particularly put on the historical and contingent character of the emergence of life, which can be seen as in conflict with the strict regularity of physical and chemical laws. The main hope, expressed throughout the book, is that the bottom-up and the top-down approaches will converge at some point to deliver a coherent account of the origin of life.

Despite this methodological divergence, later in the book all the authors agree in claiming that synthetic biology does not really contribute to research on the origin of life (pp. 122–132). It is a sort of extension of genetic engineering whose objective it not to go back into the past but to create new evolutionary paths by producing, by tinkering, organisms with new features. Some research programs in synthetic biology also aim at creating a minimal genome or cell, i.e., the minimal set of characteristics common to all living organisms. However, again, this has nothing to do

with the question of the origin of life on Earth because such researches rely on current evolved features of life (DNA and, more specifically, the set of genes characterizing currently living organisms). And even when synthetic biologists try to create forms of life using chemical reactants that probably already existed when life emerged, they do not pay much attention to the question of the original environmental conditions on Earth. They rather create those conditions that are suitable for their reaction, and so lose sight of the question of the origin of life.

The other section constituting the core of the book, “The societal debate” section, is worth reading because it raises general questions about the current features of management of scientific research, in particular the widespread call for interdisciplinarity. A recent issue of the international journal *Nature* (17 September 2015) is devoted to this hot topic, analysing its difficulties and advantages, and shares the book’s analysis in this domain. The problem is that, even though interdisciplinarity has been highly promoted by public and private funders for a few decades, and despite the fact that the reasons why it should be promoted are clear (no single scientific community owns the variety of expertise and skills required to deal with multifaceted questions such as the origin of life issue), interdisciplinarity seems more a fashion than a real scientific project because of the way it is actually applied and perceived. First of all, few researchers actually do interdisciplinary work, which means integrating, rather than just juxtaposing, research in different disciplines on a given topic. Moreover, when the interaction involves the natural and the human sciences, the latter are too often dismissed and considered as having a service role rather than a symmetrical and constructive one: this is not interdisciplinarity at all! Last but not least, the few researchers involved in interdisciplinary research are often blocked in their career precisely because they have scaled disciplinary walls and no instance exists to assess their work and promote them. Moreover, interdisciplinarity undeniably takes more time than disciplinary research because it involves people with different intellectual backgrounds that are not used to work together, often talking a different language and using different research methods. Hence, interdisciplinarity is unfit in the “publish or perish” system dominating science today. So, I fully agree with the authors that this is an urgent problem we all have to address, in particular in order to raise interdisciplinarity in science from a fashion to an actual team work tackling and solving society’s main issues (such as climate change, the impact of new technologies, research on cancer, but also other topics, such as sex and gender issues).

To conclude, I strongly recommend this book because it is perfectly designed in order to deal with the interdisciplinary question of the origin of life, which is both philosophical and scientific, and because of the intrinsic interest of this issue. If I were to mention a weak point of this book, I would say that the only hitch is that it does not give enough emphasis to the economical and political aspects of scientific research on the

origin of life. This is unfortunate because of one of the objectives of the Series "Collection 360", which is to highlight that scientific questions are also a matter of economical and political power. But this is just a trifle compared to the many qualities of the book, most of all, the fact that it raises urgent questions about how and why to promote and improve the relationship between different sciences working on the same research topic. These are timely questions because of the interdisciplinary character several current issues addressed by the society: they concern all of us, whether we are scientists or philosophers, and the lay man above all.

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Lisa Parks and Nicole Starosielski (eds.)

Signal Traffic: Critical Studies of Media Infrastructures.

Urbana, Illinois: University of Illinois Press, 2015, pp. 292

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The collective book *Signal Traffic*, edited by North American scholars Lisa Parks and Nicole Starosielski, represents a noteworthy and stimulating effort to intersect the study of digital media with the STS-rooted approach of infrastructure studies. In this sense, the book enters a wider space of convergence already under development during these last few years. Indeed, recently we are assisting to the increasing interest in the contamination between STS and a broad area involving media, communication and cultural studies. This has been the cases, for example, of the book *Media technologies*, edited by Gillespie, Boczkowsky and Foot for MIT Press in 2014 and of the workshop titled *Roads Less Travelled. Exploring New Connections Between Media Research and STS*, held at the University of Siegen in February 2015 (see Sørensen and Schubert 2015). Of course, this book adds a further significant contribution to this emerging space of convergence.

Proceeding at the intersection between STS and media and cultural studies, the aim of *Signal Traffic* is to enrich the study of digital media environment thinking to it in terms of "infrastructure", thus considering media primarily as "situated socio-technical systems that are designed and configured to support the distribution of audiovisual signal traffic" (p. 4). In their introduction, editors ask readers: "what can media studies gain by adopting an *infrastructural disposition*?" and consequently the book develops by considering several infrastructural dimensions in digital media technologies, including data centres, digital compression, Internet protocols and environmental consequences of the media infrastructure