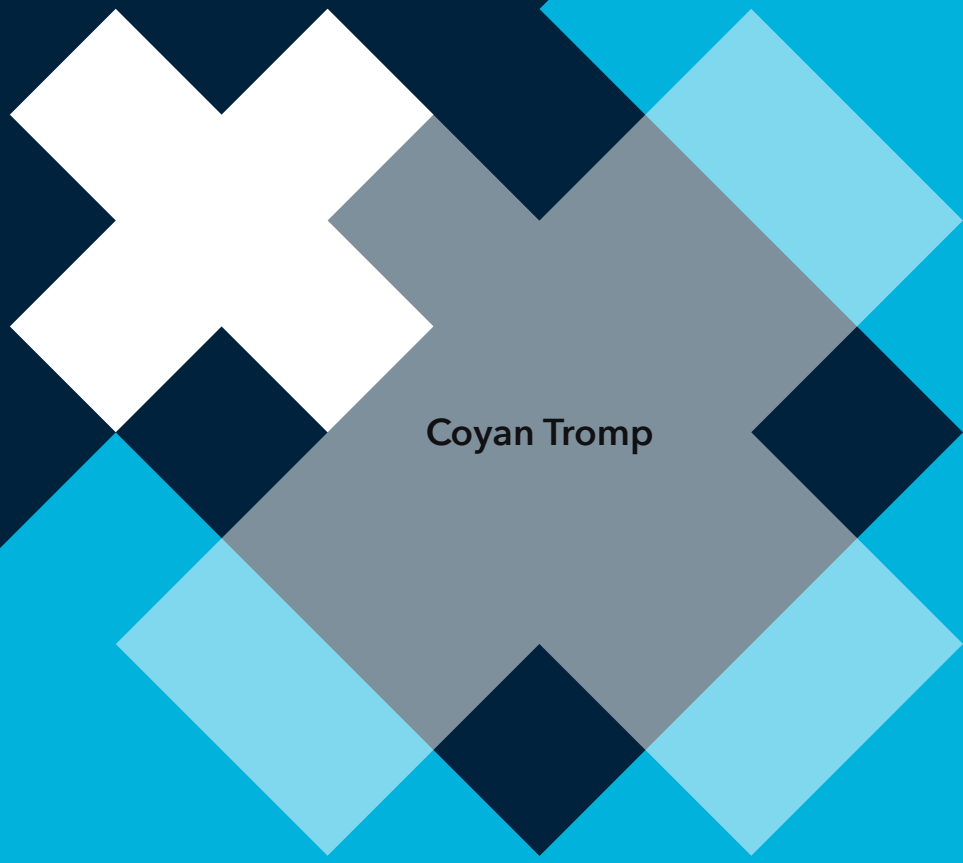
WICKED PHILOSOPHY

philosophy of science and vision development for complex problems



Coyan Tromp

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For Future Planet Frontrunners
Jim, Sjoerd, Sjef, Jasper, Vera and Marinus
who inspire me to inspire others

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Preface

A decade ago, I was recruited by the University of Amsterdam to help design and develop Future Planet Studies, an interdisciplinary Bachelor's programme that takes as its point of departure the challenges related to safeguarding a sustainable future for humankind on our planet. The issues involved – such as climate change, energy, food and water demand – are so complex and so difficult to resolve that they have been called persistent or 'wicked' problems. Assembling experts from various fields of science for the programme was a challenging yet rewarding task. We needed to gather together human geographers and political scientists as well as earth scientists and ecologists, not to mention experts on the economic and communications aspects of the various issues. My background in philosophy of science and psychology proved useful – it helped me understand the different positions held by the professors and lecturers. Realising that their positions could vary significantly, I paid close attention to the different ways they perceived the challenges, both with regard to the actual problems and to the development of a completely new curriculum that broke with conventional academic rules and regulations. Only by taking these various perspectives into account could we hope to develop a suitable curriculum, i.e. an educational programme designed to address the complex problems that represent the central focus of this programme.

When I was given responsibility for a course on philosophy of science and vision development within the programme, I faced similar challenges. It was difficult to find appropriate material. Traditional books on philosophy of science offer relatively few answers to many of today's questions. Either they focus on the natural sciences or the social sciences or the humanities; they rarely cover more than one domain. Yet we need to examine all of these and how they interact with each other to be able to find the necessary integrated approaches to contemporary challenges. Moreover, the available books usually focus on the history of the philosophy of science, while our concern is to tackle the urgent complex problems of today and tomorrow. Obviously, knowledge and experience gained in the past provide a crucial foundation for our efforts today, yet our explicit focus is the future. We need the latest insights and innovative visions to inspire us to find viable solutions. I undertook to write this book in the hope that I could help to fill that gap and meet these needs.

The big question is: how do we deal with the complex issues that confront us? Traditionally, science has aimed to provide answers to questions relating to the world

in which we live. Yet can science help provide answers to the highly complex issues that we are currently faced with? Can it offer insights and explanations and help find solutions to our urgent practical needs? Specifically: what is the role and the value of natural sciences, and what is the role of the social sciences and the humanities? How can we combine and integrate knowledge gained in diverse disciplines to provide insights, explanations and solutions? And what role does philosophy of science play in this process? These are the questions at the core of this book: a discussion of how philosophy, especially philosophy of science, can help us learn to deal with complex issues. In the end, 'wicked' problems need an accompanying 'wicked' philosophy – hence the title.

We start in chapter 1 with the good news that in response to the persistent complex problems, a new, concurrent way of thinking has evolved: complexity thinking. We investigate what makes this new approach different and where it diverges from conventional approaches in science. We also examine whether it really is geared to the particular character of complex problems. We discover that every approach inevitably rests on certain presuppositions: basic assumptions that determine how the research process is designed yet possess no scientific legitimacy in themselves. As we analyse these assumptions and reflect on their implications, the contours of a 'wicked' philosophy of science take shape, showing the conditions that science must fulfil to meet today's demands.

In chapter 2, we take a closer look at both traditional, existing approaches in science and the new approach now evolving. We investigate the various functions these new approaches can perform in terms of understanding, finding explanations, providing solutions and realising social change. We also address major criticisms that have been raised regarding each scientific approach. Our analysis shows that we need to combine all the available approaches to gain the necessary range and depth of insight into the complex issues of our time.

This task is pursued in chapter 3, where we try to build bridges between the various approaches developed in the natural sciences on the one hand and in the social sciences and the humanities on the other. We propose complexity thinking as a meta-position in which the best features of the underlying approaches are integrated and the disadvantages of each approach are avoided. This is possible when systems thinking and research into physical and social structures are accompanied by inquiry into agency. It also requires that the interrelation between structure and action are explicitly taken into account. We investigate how design thinking can help shape this aspect regarding action and how it can enhance the implementation of policy strategies aimed at solving urgent problems.

This is all the more relevant in chapter 4, where we discuss whether science always produces the most rational solutions. While it is defined as a rational learning process, science has occasionally produced knowledge and technologies that have generated less-than-optimal institutional arrangements and systems. Some if not

most of the 'wicked' problems we face are essentially unintended, unwanted side effects of well-meant scientific solutions. So we must conclude that rational decisions do not by definition coincide with wise decisions. We examine what causes this discrepancy and what we can do to reduce the risk of creating precarious situations in the future.

In chapter 5, we review the implications of a 'wicked' philosophy of science for methodology and society, and we explore how to develop sufficiently robust knowledge to enable us to find solutions to persistent, complex problems. We start with a brief recap of the various functions of the different types of research in complex problem-solving. We pay special attention to showing how research projects can be designed to enhance the engagement of scientific researchers and other stakeholders in real-life complexity. Then we look at whether science generates progress in society, and if so, under what conditions. Arguing that traditional standards of scientific knowledge are outdated, we discuss quality criteria that may be better suited to science today. Finally, we evaluate what all this means for the institutional structure of society and for researchers who need to be able to deal with complexity.

In chapter 6, we conclude by exploring the role of vision in the search for robust solutions to urgent problems. Science-based vision can help steer society in the direction of a sustainable future: vision is an indispensable source of inspiration, and it encourages us to take action and points us in the right direction. But what does vision involve? How does vision differ from scientific insight? We end with an assessment of the current situation in scientific education. How are we doing, viewed from the perspective of the challenges we face and the demands these place on today's students and future scientists? Are we on the right track? Or are we on the brink of a crisis that will demand a fundamental change in the way we organise science and society to meet the challenge of the 'wicked' problems? We present the views of some of the world's most prominent scientists and leaders and trust that by this point in the book your insight and critical skills have been sufficiently developed to enable you to determine your own position in this contemporary debate.

We help you to do this by introducing a reflexive way of thinking about complex problems that incorporates both the structural systems perspective and the actor's perspective. We also provide key conceptual tools to enable you to engage in projects involving complex problems, helping you monitor intended and possibly unintended effects of interventions designed to produce solutions to today's challenges. These tools consist of a broad range of theories and concepts to deal with the complexity of 'wicked' problems, i.e., to gain more understanding and provide ideas about how to tackle them. To help you handle the tools, definitions of the cursified key concepts are provided in a glossary at the end of the book. This glossary also serves as an index.

Since it is impossible to study the whole world and its surroundings simultaneously, the book focuses on challenges at the interface of humankind and planet Earth.

One challenge in particular – the food issue – will serve as our central case study. Various aspects of the food issue are used as concrete illustrations of the general philosophical issues that are addressed. In 2050, we will need to feed an expected global population of 9.7 billion in sustainable ways, i.e. ways that the planet has the capacity to maintain. Here we examine the type of issues this involves and the solutions proposed. These examples are presented in a series of boxes. They can help us discover how to deal not only with the food issue but also with relevant related problems. This way, the chosen example can help us deal with comparable complex problems, even with 'wicked' problems outside the chosen intersection of humankind and Earth.

I would like to express my gratitude to the Institute of Interdisciplinary Studies at the University of Amsterdam for giving me the opportunity to write this book. My thanks are also due to Njal van Woerden, Karel van Dam and Lucas van der Zee for their constructive feedback on the early drafts. I am grateful to Huub Dijstelbloem for the seed he planted in my head when he advised me to emphasise the new, more visionary developments, which encouraged me to restructure the book fundamentally a year later. My gratitude also goes to our former scientific director Steph Menken, who provided valuable comments and suggestions on some of the biological examples cited here, to my colleague John van Boxel for doing the same for the Milankovitch' example, and our current scientific director Henk-Jan Honing, who offered useful suggestions in a later phase of the writing process. My philosophical buddy Machiel Keestra, with whom I had the opportunity to exchange ideas while writing this work, provided stimulating boosts when I needed it. I am also grateful to John Grin for having shared his inspiring thoughts, particularly with regard to the action and design dimensions, which have hopefully received their proper due in the book. Jeroen van Dongen's '(no) nonsense!' comments were also very valuable – they forced me to take a critical look at my text and helped me re-examine and present the most valuable points more clearly. And Chunglin Kwa's friendly yet rigorous review helped me 'kill my darlings' and put the finishing touch on the penultimate draft.

My reviewers have helped me avoid flawed interpretations and have corrected errors easily made in the terrain covered by this book. If any mistakes remain, these are due to my own limited capacity to oversee everything that has been said and written about the broad range of topics discussed here. I hope that you, the reader, can appreciate the effort I have made to offer an interdisciplinary and to some extent even transdisciplinary philosophy of science, and that this step-by-step introduction to the issues of 'wicked' philosophy will enhance your ability to deal with the pressing, complex, 'wicked' problems of our times.

Coyan Tromp
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j.c.tromp@uva.nl