Systemic Relativism
A philosophical exploration of chaos and creation, evolution and intelligence.

Patrick Dewilde

Published by Stichting PRCS, Delft, the Netherlands, via BraveNewBooks (email: stichtingPRCS@icloud.com)
ISBN: 9789402173420

Illustration on the front page: 'Raven's Nest' by Dave Smith (Kwakwaka'wakw, Canada).

For Anne

Contents

Introduction

This book is an invitation to an exploration, an exploration of life. Life has many aspects and can be viewed in many ways, but the exploration I propose will be of the philosophical type. Biology, known as the science of life (that is what the term says), studies how life originated, how it is constituted, how it evolves, how organisms function, how they relate to each other and much more. Philosophy, on the other hand, takes life for granted and wonders how we, humans, can deal with what we experience as our life, how we relate to each other and our environment, how we function as communities, even how we evolve and what we may consider our future. All questions that have to do with the position of humans in life, their relation to life, to the world and to nature in general.

We humans are definitely peculiar participants in the realm of life, and life as a phenomenon in nature. As biological organisms, we are endowed with a most intricate organ, our brain, which we perceive as the seat of our mind. We call that experience 'consciousness'. This consciousness makes our exploration of life possible, just as it makes biology and any other type of science possible as well. As a species, we are able to study life as a phenomenon, including how *our* lives are constituted and develop, but we can also view our lives as what we call 'ourselves'. To explore our position as humans in the big system of nature is what I am inviting my readers to do with me. The territory we shall have to cover will undoubtedly be rugged and perhaps unaccessible, and we have only our minds to hold onto. It makes one think of the vertical rock climber who has to attach the rope he needs to pull himself up.

To marvel at life and the place humans have in it, is of course as old as philosophy. What makes the present day situation different are the enormous advances science and technology have made in the 20th century, and in particular biology with the discovery of how our brains are constituted and how they function. I shall argue, agreeing in this with many philosophers, that philosophy is a science in itself, because it uses scientific methods, namely the development of theory and the verification of the proposed contentions by experimentation. As a result, philosophy is dependent

on other sciences and vice versa. This dependence will be central to our exploration. Since science has changed so much, philosophy has to as well. We are on new territory here.

This is why I wrote this book. As a scientist and engineer who has been interested my whole life in philosophical issues, I have been confronted with the many and fundamental changes in scientific thinking that occurred in the 20th century. Many of them are spectacular, but not all of them are directly relevant to philosophy. In the first chapters of this book I shall account for those that I consider indeed very relevant to our quest, and thereby lay the basis for our exploration. They are: new fundaments for logic due to Gödel; 'chaos' as a pervasive phenomenon in all non-linear dynamical systems; the related 'emergent behavior' that makes creativity in many new directions possible; and 'evolution' and the emergence of 'intelligence' as its present main driving force. All the terms used so far shall need careful definitions. This will be an important part of their exploration.

The new insights in logic, in the wake of Gödel's incompleteness theory, now a central tenet of logic, will force a relativistic approach on us. This will be perhaps the most contentious part of our endeavor. Relativism has been decried as a major philosophical mistake and the basis for licentiousness and lack of ethics. However, the brand of relativism that I shall follow does not allow for such things, quite on the contrary. I have called it 'systemic relativism'. There shall be no relativism *within* a carefully defined system of thought, but the precise definitions, premisses and methods of that system, what we shall call its context, will always remain subject to criticism, say from 'outside'. This process of criticizing a given system necessarily requires the definition and development of a new system of thought outside the original, with its own premisses and methods. Following that insight, we shall need to reconsider such age old notions like 'semantics' (or the meaning of utterances), 'truth', 'freedom' and 'epistemology' (or the theory of knowledge), none of which will have an 'intrinsic' or absolute meaning. We shall have to clarify these notions in the new context of systemic relativism, devoting several chapters to them.

However, the main issue this book aims at, is the development of ethics in the context of systemic relativism. We shall discover that the incidence of chaos and emergent behavior makes unfettered creativity possible, only limited by controlling power structures, which are mostly emergent as well, that is, largely unpredictable. Although 'survival of the fittest' (within a specific environmental context) is the natural biological controlling principle, the evolution of life has gradually developed intelligence as another, very successful, steering agent. Ethics will be seen as an intelligent layer that supervises the quality of the systems humans and their societies try to develop, much like design engineers do, who use the knowledge of their

art and the goals of their designs to implement their quality ambitions. Ethics so becomes an evolutionary driving force in its own right, defining novel teleologies based on intelligent quality assessments. These may be well conceived or not, but without ethics, any new development would lack direction, but, as there is no absolute 'good' in systemic relativism, there is no absolute ethics either. All actual ethics will hence need control on its quality as well. Such an escalating process of evaluations necessarily makes all ethics evolutionary. How this works out is an important part of our treatment of ethics.

Our exploration then ends with a critical analysis of the common notions 'principles' and 'religion', and a comparison of the likeness or differences with some other systems of thought. Given the wealth of topics to be considered and their intricacies, our exploration will only be a beginning, and an invitation for ever deepening further forays. But this is not any different than any other scientific exploration. The more we get to know, the more questions emerge, or, as the old Chinese poet-philosopher puts it,

> From wonder into wonder existence opens.

Acknowledgements

I am indebted to many people who have kindled my interest in philosophy, starting with incomparable teachers in my high school, Sint Pieterscollege, Leuven, Belgium, where the spirit both of scientific enquiry and respect for civilization was very much alive and enthusiastically communicated. At the Catholic University of Leuven I followed the courses of, in particular, Dondeyne, Ladrière, De Smale and D'Hondt on various philosophical topics. Over the years, I participated actively in a philosophical reading group (the 'Circle'—*Kring* in Dutch) and am very much indebted to several of its members for both providing reading motivation to sometimes difficult texts and critical analysis. Thank-you, Christine van Ham-de Vries, Klaus Reinhartz, Jan de Haan, Koosje de Neef and Hans Blok for continuing this effort, participating in many hours of discussion and providing invaluable interpretative inputs. I am equally grateful to all the former members of our Circle, too many to mention by name. Nonetheless, let me single out two of my colleagues and former members of our Circle to whom I am especially grateful for so many fruitful interactions in the past, Aad de Hoop and Jacob Fokkema.

The discipline that preoccupied me professionally most of my life was dynamical system theory. When one starts thinking about what makes systems tick, one very quickly discovers the enormous incidence of (mathematical) chaos, a central concept in dynamical system theory. *Linear*, time invariant dynamical systems are important because they can be engineered

and controlled very precisely, but most systems in this world, especially biological systems, are highly non-linear and hence most often than not subjected to chaos. Chaos is at the roots of emergent behavior, a concept pioneered among others by the Belgian Nobel Prize winner Prigogine, and hence also at the roots of the emergence of intelligence. From there, the step to continuous creativity and emergent teleology is not that big. Many scientists and colleagues contributed to my thinking on dynamical systems, let me just single out three with whom I had the most intense contacts in this area, the late Rudy Kalman, Tom Kailath and Leon Chua, of course not to talk about my many students, with whom I had so many direct and illuminating interactions.

All this means that I am very much indebted to lots of past and present writers, philosophers, scientists, colleagues, friends, family members and discussion partners, so many that I do not feel capable of making a list that would do right to all the people who deserve it. I mention a few of them in the text, but I do feel very much indebted to so many more. I do want to mention my dear, wise, generous and loving wife Anne, my charming children Sabine, Benjamin and Muriel, and my equally charming children-in-law Bart, Elisenda and Jan, because of the way they enriched my life and in particular the many discussions I had with them over so many years and the many ways they have influenced my thinking. A special note of thanks goes to my son Benjamin, who went through the text in its early stages and contributed many suggestions for improvement. In about every chapter I got the feeling that the list of people I am indebted to is even longer than the text itself!

In a different direction, I feel very much indebted to my grandchildren as well, who not only provided me with a charming laboratory of chaos, allowing me to watch the wonderful emergence of unique capacities in each of them close by, but also succeeded in keeping my two feet on the ground when my mind was drifting off in too theoretical endeavors. I wish them, Noémi, Keiner, Nathan, Yuleidis, Lucas, Joel, Aurik and Alejandro, and all our young people wherever, a new world of sustainability, intelligence, creativity and humanity, but I am also conscious of the fact that the world my generation leaves to them needs major improvements to meet even the most elementary quality standards. May this book be a small contribution towards that goal.

Concerning the final redaction of the book I got substantial help from a professional editor, Ms. Melitta Konradi, who not only extensively corrected my Dutch-tainted English writing, but also contributed structural elements in aesthetics and neural science, based on her extensive experience with those topics both as an artist and as an editor of scientific papers in these areas. Thank-you, Melitta, you have been of great help in improving

both the content and the form of this book.

For the illustrations, I am very much indebted to Martha Waijop, a famous Dutch sculptor with a very original and characteristic style, who succeeds in representing complex ideas in a direct and almost natural way. Thank-you Martha for allowing me to use your work to enliven an otherwise dry text.

In the course of writing the book I got material support from the TUM Institute of Advanced Study, which offered me very nice office space and accommodation so that I could develop my ideas and do the writing in comfort and peace. I am very grateful to the staff of the Institute for making all that possible. In the same period I was also a formal guest of Delft University of Technology, which allowed me to make effective use of library and computer facilities there, for which I am also very grateful.

Typography

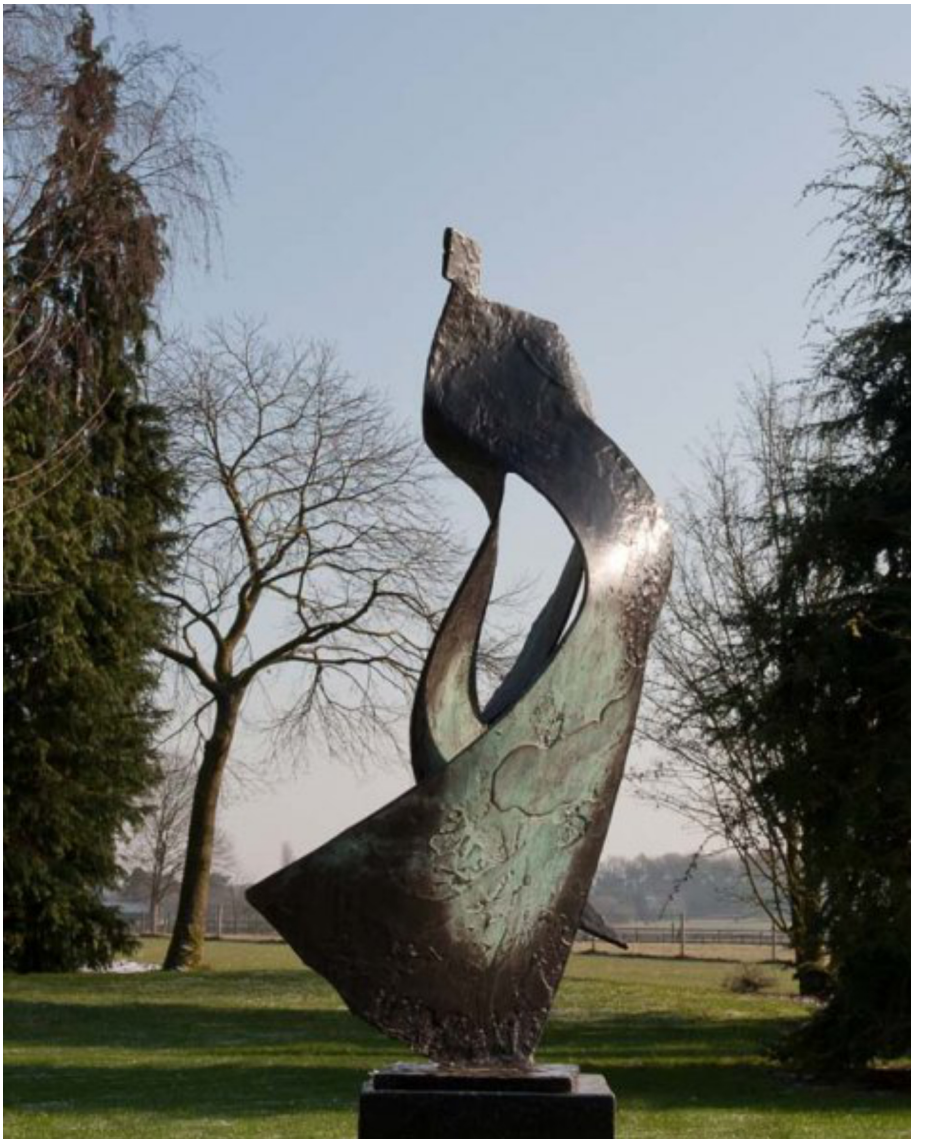
To conclude this introduction, a word on typography and usage. I use single quotes, as in 'good', for words that acquire their meaning in the text (or to put it differently: that are used in a specific way); double quotes for quotations as in Teilhard de Chardin's famous "voir ou périr"; and a capitalization for proper nouns (as in Truth, indicating the chapter on the topic, while truth is just the noun.). Indeterminate gender of a human actor creates a problem. Recently, the use of the plural for reference to a single person of indetermined gender has been accepted by some scholarly groups (for example the American Psychological Association). In the course of writing, I have started to adopt this last convention.

Each chapter is preceded by a short italicized summary of its main line of thought. This is mainly for easy content reference between chapters, as many are highly dependent on each other.

Illustrations

Title page: Raven's Nest by Dave Smith (Canada) — own possession and picture.
Page 2: Martha Waijop, *Lady of the Night*, with permission by the artist.
Page 24: Samuel Monnier, low resolution detail of an artwork inspired by the Fibonacci Word Fractal. Original owned by Alexis Monnerot-Dumaine. Downloaded from Wikimedia Commons.
Page 38: Martha Waijop, Windharp, with permission by the artist.
Page 50: A Kwakwaka'wakw totempole scultpure from the village of Gitanyow: own picture.

Page 62: Sue Savage-Rumbaugh, Kanzi and his sister Panbinisha working at the portable symbol keyboard. Picture taken by the W.H. Calvin on April 1st, 2006, and freely available for distribution under the 'Creative Commons Attribution-Share Alike 4.0 International' license.
Page 76: Open flag semaphore from Wiki Commons.
Page 88: The Venus of Willendorf, an example of Paleolithic art, dated 24-26,000 years ago. Picture available on Creative Commons, with permission to distribute under the GNU Free Documentation License.
Page **??**: Martha Waijop, *Dust in the Wind*, with permission by the artist.
Page 158: Central picture in the 'Isenheimer altar' in Colmar by Matthias Grünewald. Picture of the 'Muse d'Unterlinden, Colmar, free for distribution from Wikimedia Commons.
Page 178: Mural of the painting *Guernica* by Pablo Picasso in Guernica. Photograph by Papamanila, available under Gnu license "Creative Commons Attribution-Share Alike 3.0 Unported."
Page 206: Zen Garden in Hōkō-ji (Hamamatsu). Picture author: Mikkabie, free license from Wikimedia Commons.
Page 222: German Christian organizations celebrating Luther Day in Berlin, 1933. Picture from the German Federal Archive, freely available from Wikimedia Commons (Bundesarchiv, Bild 102-15234/CC-BY-SA 3.0)
Page 242: Andreas Vesalius dissecting a corpse. From *De humani corporis fabrica*.



Martha Waijop, *Lady of the Night*

Chapter 1

Socrates

Socrates defined ethics as "how to live a good life" and this book starts out fittingly with discussing this point, since its main concern is the development of a philosophy that closely adheres to the objectives of one of its main founders. In starting with Socrates' view, it follows the work of the late Bernard Williams, who makes a case for a broad definition of ethics as how a person or a society envisage their life process. Williams distinguishes ethics from morals in terms of what is obligatory behavior, mostly in critical situations, whereby the assessment of a critical situation or whether obligatory behavior is called for is dictated by the chosen ethics. Socrates can be seen to adopt a relativistic view from the start although it may seem that he compromises relativism in his dialogue with Protagoras, but a careful consideration of his position shows his extreme skepticism towards any formal claim of truth, making him de facto a 'systemic relativist'. The opposition between unfeathered relativism on the one hand and an uncompromising acceptance of at least some absolute truths makes an intermediate position necessary, which is also the position Socrates seems to take. Socrates' question can be interpreted as 'how to design one's life' or 'how to design society', which brings up the question of how to judge the quality of one design with respect to another. Evolution and the role of intelligence in it are bound to play a role in the treatment of Socrates' question.

In the market place of ancient Athens, the Agora, people met not only to exchange goods, but also to discuss politics, gossip, comment on events, communicate ideas, and even make decisions (later the impressively arcaded Stoa was erected for such purposes, testifying to the power of ancient Athens). In contrast to the Acropolis, which was the religious center of Athens entirely devoted to worship, the Agora on its Eastern slope was a place where freedom of speech was at least possible, and critical thought on conceptual matters made a by hindsight wonderful appearance. A new type of characters emerged, sophists or philosophers, and their non-conformal

thinking appealed to the local youth. So Socrates. Although there were quite a few philosophers in ancient Greece before him and thanks to the recordings of Plato, Socrates may be considered the patriarch or founding father of Western critical philosophical thought, and in particular may be credited for creating the discipline of *how to think philosophically* rather than proposing a closed system of presumed truths. One of his main concerns was the question of ethics, the question of "what it means to lead a good life". I am indebted to the great former professor of philosophy in Oxford, Bernard Williams, for a pertinent analysis of Socrates' ethical thought in his landmark book *Ethics and the Limits of Philosophy* [61], which has been a great source of inspiration for me and Williams' many admirers.

In discussing Socrates' question in the first chapter of his book, Williams advises against interpreting the term 'a good life' in a moral sense, namely 'good' as the antithesis to 'morally bad' interpreted as "what *cannot or should not* be allowed". In Plato's *Republic* the discussion between Socrates and Trasymache in section 352 centers on whether one can judge a person's choice for a good life or a bad life and how one would go about evaluating a person's actual choice. Socrates insists on considering the issue carefully (352(d) (my free translation inspired by [53])

> Whether the existence of people who lead a good life is more valuable than that of those who do not, and whether their happiness is greater (...) we must carefully consider, because it is not at all a trivial question, since it deals with the issue of how one should live.

He then goes on discussing the issue at length (worth the reading!), trying to ascertain whether a person who acts justly should be happy and one who acts unjustly unhappy (354(e)). He concludes the discussion with

> ... the impression presently produced in me as a result of our conversation, is that I know nothing! Suppose indeed that I would have no idea what justice is, then it would be hard for me to know whether it is an excellent thing or, just as well, not so, and whether anybody who possesses justice is happy or just as well not.

The issue Socrates struggles with in the conversation is the view that each organism (or piece of it such as the eyes or the ears) is made in such a way as to produce its own excellence, which is equivalent to its functioning properly. If that is the case, one cannot do it justice classifying its actions as good or bad. Hence, without further analysis of 'justice', its occurrence

cannot be deduced from the state of happiness or unhappiness of its bearers or whether they interpret it as good or bad (my own interpretation of course)[1].

According to Williams and classicists versed in ancient Greek texts, the term 'good' as used by Socrates does not have an imperative charge. It is best circumscribed as 'excellently satisfying its purpose' or even just 'functioning properly'. Also the term 'should' has to be dealt with carefully, because the ancient Greeks employed it differently than we do, conditioned as we are by so many ages of moral rule setting. The central ethical question can then be circumscribed as "how can one make the best with one's life given one's circumstances". The ethical issue is the development of one's character (what the Greek word 'èthos' actually means), in particular, the personal governance of one's life in private and public. This has little to do with 'should' or 'should not', notions that came up only later[2], mainly in the wake of Christianity and its insistence on behavior according to "God's law".

How we conduct our life in actuality, consciously or not, may then be considered our true ethics. How does our ethics arise in the course of our lives? We receive many influences from a young age, and, depending on our possibilities and abilities, we sort them out, we select those that we find valuable, that please us, or that are simply impressed on us by parents, siblings, teachers, friends, and colleagues. When we fail to pay enough attention to what our environment considers important, it will forcefully impose its values on us, and often we will have no other choice than to act accordingly even when our tendencies or intelligence tell us otherwise. But at other times, we do seem to have some choices, e.g., as in crucial moments when we change schools, look for a partner or for a job. The question whether at any time we are indeed able to make a 'free' decision, one that is not forced on us either by our environment or by our unconscious preferences, namely the question of the 'existence' of 'freedom', is a complex one that I do not want to consider further in this chapter. Instead, I am devoting chapters on both notions. For the time being let us accept that our lives are not fully pre-ordained and that room for free choice is not an illusion[3].

In the wake of Plato's texts and descriptions, Socrates has often been

[1] The same issue is also prominent in the thoughts of Marcus Aurelius [2].

[2] In the case of ancient Greece: decency, courage and the avoidance of shame were the key values [62].

[3] The question of the relation between freedom and determinism is very convincingly treated by Daniel Dennett in his book *Evolving Freedom* [17]. Although I refer to Dennett's views on this, I do have a somewhat different take on the issue, which I consider in the chapter on Freedom.

depicted as an idealist who believed in unequivocal values for truth, beauty and justice. However, according to him, these values are hidden to the majority of mortals living in the dark grotto of daily life and common opinions[4]. From such an idealistic perspective, a piece of music or the architecture of a temple is beautiful in as much as it participates in the ideal of beauty, much like the worth of a jewel increases with its setting of gold. The absurdity of such a conception was beautifully brought to extremes by Kirkegaard in his book *Enten-Eller* [37], where he shows that for the ideal of eroticism there can only be one opera that perfectly conveys it, that opera being Mozart's Don Giovanni—all other attempts at achieving ultimate perfection in eroticism should be considered miserable failures.

Nonetheless, the view of Socrates as a philosophical totalitarian is misguided, and it is Socrates himself who most clearly expresses his complete distrust of any absolutist interpretation of his or anyone else's statements (from Plato, *Letters VII*, 344cd):

> All modes of knowledge express the properties and the existence of each thing using the imperfect instrument of language. Therefore no wise individual will take the risk of confiding his ideas to language, and certainly not in the form of stone characters.

Still, one might object that "yes, Socrates distrusts words and interpretations, but he also believes that there is an underlying absolute truth. The problem is that it belongs to the deeper spheres of understanding and cannot be adequately expressed or communicated". This way of viewing Socrates' philosophical outlook may be correct, the point I want to make is that Socrates called awareness of the relativity of words.

I shall argue one level deeper, namely, that the existence of a unifying human understanding is an illusion one can dispense with, but this position will need a much more complex discussion than the relativity of language and communication, which is much easier to demonstrate. A thorough discussion of what can be meant by 'existence' and by 'semantics' (the theory of meaning) is thereby unavoidable. Interestingly enough, this discussion will lead us to why the duality between 'matter' and 'mind' cannot be avoided, although both are defined by and within the biology of our human brains.

Some of us may feel anxious from the lack of stability implied by Socrates' distrust of any statement or reasoning. Worse, any attempt at producing stability appears guaranteed to fail when carefully considered (as we shall do in the following chapters), leading to exactly the opposite of

[4]Plato, *Republic*, 514a.

what is intended. I am sure Socrates saw this gaping precipice in our human consciousness. Maybe he did believe that there exists a realm of certainty but that the majority of us are unable to access it, rather than an infinite abyss. Meanwhile we have grown accustomed to dealing with infinities and infinite regressions, and, although we may not be comfortable with them, we certainly are not as terrified of them as the ancient Greeks were[5]. The precipice we are gaping into has no bottom. We are just hanging above it grasping the tiny roots of our intelligence, like the Zen monk grasping the roots of a strawberry bush that is sticking out from the rock along which he hangs after his fall in the precipice. Like him, we have to live with the delicious strawberries in the environment that happens to be ours while also glimpsing the gaping tiger muzzle below us and little mice nibbling at our roots above. (With an infinite abyss there shall be no gaping tiger!)

Remarkably, the ancient Chinese poet philosopher, Lao Tzu, saw the precipice of infinity as well and writes (nr. 14 in the beautiful translation of Witter Bynner [8])

> What we look for beyond seeing
> And call the unseen,
> Listen for beyond hearing
> And call the unheard,
> Grasp for beyond reaching
> And call the withheld,
> Merge beyond understanding
> In a oneness
> Which does not merely rise and give light,
> Does not merely set and leave darkness,
> But forever sends forth a succession of living things as mysterious
> As the unbegotten existence to which they return.

Socrates's question is about "designing one's life", or, if you prefer, "engineering one's life". This is not a solitary exercise. He investigated not only how to develop one's views and insights, but also how to share them with others, given the uncertainty inherent in human communication, in particular, language. Such considerations do not have to be restricted to the personal sphere, but may be lifted to the level of human society as well, another exercise Socrates engaged in.

In the remainder of this chapter, I want to make a few introductory considerations on Socrates' ethical question, just to introduce the reader to

[5] We more or less overcame the Pythagorean horror of non-rational numbers, thanks to the "axiom of choice", but not without a lot of still ongoing debate [38]. Later we even got imaginary numbers and quaternions!

how I propose to approach the issue further in the book. Many elements will contribute to the overall picture, fairly well represented by the titles of the subsequent chapters, but here I wish to give a quick foretaste of the buffet that will be ours.

What can be considered a "well designed life" or a "well-designed society"? In our twenty-first century, having adopted the theory of evolution and obtained much more extensive collateral insights in biology, we would be tempted to state, "one that insures the best possible prospects for natural selection", by which we might understand, the 'best' design will win out in competition with other designs.

However—and this is a very important point that we shall have to deal with extensively—from a mere principle (an abstraction, regardless of its scientific foundation) one cannot deduce concrete action, for that would require at the very least additional knowledge of the environment in which the action takes place and, in particular, how the principle functions in that environment. The principle may set constraints or define a desirable property, but it does not tell us what a precise design would look like. To give a quick illustrative example, in the period in which I am writing this chapter, my wife Anne and I are busy making a photographic potpourri with photos from our trips to India, to adorn a wall of our guest room. We had no problems formulating the principles of arrangement. Make colors fit, select themes that match and devise geometries that provide a sense of order. It took us many days of trial and error to arrive at a result that somewhat satisfied our aesthetic tastes, but none of our principles could be fully accommodated.

Natural selection, unknown to Socrates (as far as I know), is a most delicate notion to handle because it hinges on highly uncertain anticipation (who would have predicted that such a clumsy organism like a human would be so successful in the selection game?), but it plays an important, if not determining, role in what might be considered a 'good' design of one's life. Surely, designs have to be robust (so that they survive usage), be of at least adequate functional quality (so that they are competitive in a critical environment), and satisfy the genetic requirements for durable selection across generations. But natural selection is an *a posteriori* criterion. Other factors that generate properties or quality play a driving role.

One such factor is intelligence. However you understand it, intelligence is a powerful, if not the most powerful, agent in steering natural selection, but it is already very effective in normal societal commerce. The notion of intelligence may seem vague at this point, and I shall discuss it intensively, but, to grossly summarize, it can be defined as "the faculty to develop scenarios, evaluate their outcome and make decisions based on knowledge and past experience". It is the faculty that makes humans capable of "designing

their lives", at least to a certain extent, depending on their other abilities and the means at their disposal. We can imagine what the effects are of actions we undertake, evaluate them in terms of various types of (real or imagined) benefits and then take action on these if we can (mostly using proxies which our intelligence is capable to activate). It will depend on the scope and validity of such 'evaluations' whether the outcome makes evolutionary sense. Viewed in this way, ethics becomes a central human endeavor on whose quality even the future of humanity may depend.

It may seem strange that a chapter on Socrates ends mentioning biological evolution. Intelligence plays a central role in the evolution of humanity *and* conditions our behavior through anticipation and evaluation. The first time I realized this was while reading the introduction to Teilhard de Chardin's *Le Phénomène Humain* [13]. Here is what he says, paraphrasing Shakespeare (abbreviated and translated by me):

> The history of the living world reduces itself to the elaboration of eyes that get ever better in the midst of a Cosmos in which it is possible to distinguish ever more... To seek to see more and better is not a phantasy, a curiosity or a luxury. *To see or to perish* (my italics).

Socrates' simple question "what it means to lead a good life?" introduces the philosophical discussion. Exploring it, following the path Socrates has set out, one discovers that a direct and conclusive answer to the question is not possible due in the first place to the limitations of language, but leads to a deeper understanding of ourselves, our position in the world and nature, including an understanding of the thinking process itself. The exploration can therefore only be based on the best insights humanity has acquired so far from scientific enquiries (logic, dynamics) and in particular biology (evolution), including an understanding of the thinking process (intelligence and consciousness). This exploration will be our first concern, leading subsequently to a closer look at how Socrates' question impacts on the conduct of our lives and on our interaction with each other in the context of our societies. Could it be that the process of life itself continuously generates an ever evolving answer, making the practice of ethics a novel driving force of evolution?

Chapter 2

Kurt Gödel and relativism

This chapter introduces 'systemic relativism' as our main mode of philosophical thinking. The central idea behind 'systemic relativism' is to replace absolute relativism by relative absolutism. This may be seen as the most important insight contributed by logicians in the midst of the previous century, in particular by Gödel. Although Gödel's theory is technical and not presented here in detail, its basic insights and conclusions are formulated, in particular in what is called "Gödel's incompleteness theorem". A consequence of Gödel's incompleteness is that a comprehensive theory of 'truths' necessarily leads to contradictions and hence cannot 'exist'. The classical charge of inconsistency of the contention "there is no absolute system of truth" is therefore necessarily incorrect. This may seem mysterious, and the chapter then goes on showing how the mystery can be lifted by a good understanding of what would be an 'absolute' truth and what would not. So is the negation of absolute truth not an absolute truth itself when proof is contained within the running context (this point is explained in detail). We make a distinction between 'positive propositions', which are propositions that are added to a system but might be inconsistent, and 'negative propositions', which only claim inconsistencies. To assert a negative proposition, one only has to show a contradiction, while proving the consistency of a positive proposition appears to be impossible in most cases.

Relativism has a bad reputation. It is often decried as generating ethical nihilism, the attitude of people who have no firm beliefs or direction for their lives, and who therefore tolerate or even advocate all sorts of dubious practices that threaten societal order (Epicurists from Epicuros to Onfray have been decried as destroyers of civilized society). It makes, however, no sense to base societal order on misguided principles (whether it should be based on principles at all and, if so how, will be the topic of a chapter on 'principles'). Philosophy is not a freewheeling discipline. Its practice can have very dramatic consequences. I do not want to go into the horrors

that some systems of absolutist thinking have inflicted on humanity in this chapter, but wish to focus first on what could be termed the "basic theory of systemic relativism", which aims at a healthy balance between the need for direction and skepticism. My goal is to offer several strong motivational arguments, and to develop a methodology for philosophical thinking that provides a sensible relativistic perspective on ethics in the Socratic sense.

The thought behind 'systemic relativism' is to replace absolute relativism with relative absolutism. It is a discipline that consists of making explicit whatever considerations, assumptions or methods are taken for granted and enforcing rigorous derivation of conclusions from these primaries, while at the same token acknowledging their potential relativity within a broader context. Systemic relativism does not allow any relativism with respect to what derives from the basic assumptions, but leaves the latter open for separate criticism and critical appraisal. It is motivated by the observation or belief that all thinking is necessarily based on prior assumptions which cannot be questioned within the system itself (except for consistency), while these prior assumptions must be left open for questioning at a 'higher' level of assessment of the system proposed.

One should realize that, in most thinking processes, new and unproven assumptions are continuously and often surreptitiously added to the existing system. The straightforward way of dealing with this continuous expansion of accepted assumptions is: (1) to make sure that they do not contradict previous assumptions; and (2) to always keep them open for critical review outside the given paradigm. Thus, we arrive at the term 'systemic relativism', i.e., relativism at the level of the definition of the system but not within the system.

The very first argument in favor of systemic relativism flows right out of Gödel's theory in mathematical logic, and will clarify the notion from the start. This may be surprising, because one would not expect mathematical logic to be tainted by relativism. However, it has become the cleanest environment in which systemic relativist thought is presently practiced, thanks to the pioneering work of Gödel, who contributed the present golden standard in mathematical logic. Let us therefore look at Gödel's new and unexpected contribution.

When one restricts one's field of discourse drastically to a strictly logical context called 'second order logic[1], as Gödel does, and assuming in addition the ability of counting[2], then Gödel's Incompleteness Theorems show that already in that restricted context the number of correctly formed proposi-

[1]It is the logic of propositions and predicates, to be made more explicit later on.

[2]Second order logic does not imply the ability of counting. One has to add some elementary set theory in the style of Zermelo and Frankel [29] for that. See further chapters for a more detailed discussion

tions that can be derived from any set of basic axioms is essentially limited in the following way: there is an uncountable number of well-formed propositions that cannot be proven or disproven from any set of basic assumptions [27]. It then follows that any one of these new propositions can be added to the system as either true or untrue, without impairing the consistency of the system, one at a time of course. Thus, at each step, two competing and contradictory systems based on the same primary axioms are created that each have equal claims to logical validity. Such constructions can be continued stepwise ad infinitum, creating an uncountably infinite number of valid systems that contradict each other (valid in the sense that they do not contradict the primary principles).

It has been argued (almost universally) that Gödel's theory is not relevant for philosophy, not even for basic science. I shall now argue that such a contention is structurally mistaken. The feat that Gödel's theorems and their proof accomplishes for philosophy, is that it refutes the intrinsic inconsistency of the statement 'there is no absolute system of truth'. Gödel actually shows that the opposite assumption of a full (absolute) *system* of truth, formulated by logical propositions (under the already very weak structural assumptions of what is termed "second order logic" plus counting) itself leads to contradiction. The Gödelian contention turns out to be an absolute statement about the impossibility of an absolute system of truth—yes indeed—but then only 'absolute' in a very restricted logical sense (i.e., relative to the logical rules used), yet fully applicable in any system of thought in which the most elementary logical assumptions hold[3].

The relativity of a logical theory is based on the fact that it always and necessarily posits an agreed upon prior axiom system whose claim for truth cannot be subject to proof within the given system, except for consistency. A very nice example is the common axiom system for mathematical set theory (the basis of almost all practical mathematics, neatly described by Halmos in *Naive Set Theory* [29]), namely the Zermelo-Frankel system, whose first six axioms are not proven themselves, but can be proven consistent[4], i.e., not contradictory. Once the basic axioms are defined, the mathematical theory evolves further, not only deriving truths from the agreed upon axioms, but adding new ones to cover new fields (such as Euclidean geometry, or in the case of modern physics, the more general Riemanian geometry). Other endeavors, e.g., physics or many fields of engineering, can then be further developed by adding specific new assumptions, while agreeing on the basic mathematical framework.

[3]We shall see later that the rigidity of the second order logical system does not necessarily qualify it as a valid model for nature. In fact it does not, as most models for natural evolution need a timing dimension that interferes with logical deduction.

[4]For a proof, see e.g., Paul Cohen, *Set Theory and the Continuum Hypothesis* [10].

However, this beautiful and effective method of generating (relative) truth encounters some difficulty with the seventh axiom of the classical Zermelo-Frankel set theory, the "axiom of choice" on which most mathematics and in particular Hilbert space theory is based. Hilbert space theory provides, in turn, the basis of quantum mechanics and its several further developments. The axiom of choice on which all this is based appears to be very innocuous at first sight. It only states that, given a collection of sets of objects, one can always construct a new set defined by the (seemingly anodyne) property that it contains at least one object from each member of the collection. The axiom is instrumental in defining non-rational numbers such as $\sqrt{2}$ or π. These are numbers that induced terror in the ancient Greek mathematicians[5]! The axiom of choice runs into problems as is e.g., well described by the mathematician and historian Morris Kline in his book *Mathematics: the Loss of Certainty* [38]. Kline shows even much more, namely that there does not exist one presently known mathematical theory that does not eventually encounter logical problems. This should provide food for thought to people who think that they can ever know anything for sure!

Human language does not so obviously run into such difficulties, but only because of its inherent imprecision. The more you strengthen logical thinking, the more you get into problems [6]. This does not mean that the difficulties even the most elementary logic system encounters, would not be relevant to the more relaxed human reasoning processes. As soon as one starts restricting one's thought one runs into them, and sloppiness is not what we would like to nurture in 'systemic relativism' (although it may have some merits keeping human communication manageable).

The next point I want to make here is that the logical analysis of such (logic) systems requires quite a different kind of theory, namely, a logical basis for logic itself, what would amount to a 'super-logic' or, better, a 'meta-logic'. A statement like "there is no comprehensive axiom system for all mathematical truth" (based on Gödel's Incompleteness Theorem), is a statement that has to be made within such a 'fundamental' axiom

[5]Pythagoras discovered that the hypotenuse of a rectangular triangle with sides equal one was a number he could not express as a ratio of integers and hence did not exist in his system of thought.

[6]Here is a nice classical example: you can use language to describe numbers, e.g., you can say that "the number π is the ratio of the circumference of the circle to its diameter", or you can write a computer program that will generate it, etc... In the first definition just given, I used 78 characters to describe π. Now consider the set of numbers that cannot be described in less than a thousand characters (i.e., in about one page). Now take the smallest of those. Can this be?—I just described that number with less than a thousand characters in the previous sentence (just 21)! The problem is the formal imprecision of the description, not its logical meaning.

system for logic. One would think, given the requirement, that such a system should be exceedingly complex. The surprise is that it is actually very simple, at least in normal practice. The only ingredients one needs for meta-logic are: (1) the possibility of stating correct propositions (the propositional syntax); and (2) the mechanics of deriving new propositions correctly from them, i.e., derivations. In the history of philosophical logic, a number of such derivation systems have been proposed (see, e.g., [5]). It turns out that only one derivation rule (besides, of course, the syntactical rules to construct propositions) is actually needed, and the rule called "modus ponendo ponens" is what does the trick (as will be described in the next paragraphs).

Here is a quick summary of how this rule works. Propositional logic, as a theory of logical derivations, is not interested in the precise content of a proposition, only in the 'truth value' it may have, which is defined as either 'true' or 'not true', depending on the context, this value being the only property of a proposition that plays a role in further derivations[7]. Logicians therefore represent a proposition with an abstract symbol such as $p, q, r, ...$, which may acquire the value 'true' or 'untrue' depending on the precise context. This precise context is subsequently of no interest for the logical derivation, as logic is only concerned with which effect a proposition being true or untrue will have in (syntactically allowed) combinations with other propositions. Given this basic property of a singular proposition to be true or untrue in a specific context, propositional logic then allows one to make further assertions by combining propositions in a precise way, e.g., as in "q follows from p ($p \rightarrow q$)", "q and p are jointly true ($p \wedge q$)" etc... (this is the 'syntax' of well-formed propositions.). "Modus ponendo ponens" as the operational principle of our meta-logic then asserts the following: "If the proposition 'q follows from p' is true, and p is true, then the truth of q follows" as in the famous "All men are mortal, Socrates is a man, hence Socrates is mortal". Whether all men are indeed mortal, or even what the term 'man' means, is not at issue here, only the mechanics of the derivation belongs to logic. In propositional logic one actually shows that all other rules of derivation considered in traditional (mediaeval) logic can be written as combinations of modus ponendo ponens.

It is in such a framework that Gödel proves the logical non-existence of an absolute system of axioms, i.e., a system in which *any* correctly formulated proposition can be shown to be true or untrue. As already mentioned, Gödel adds a requirement, namely, that in the framework counting is possible. His proof depends essentially on the ability to assign unique numbers to

[7]For example, the truth of the proposition "the color of my hat is green" depends on who is making the statement.

individual propositions, actually a sneaky, but hardly controversial, way to introduce infinity. He shows that when one assumes the existence of such an absolute system of axioms, one necessarily runs into contradictions (Gödel's proof is constructive, which is much stronger than just an existential proof.). The assumption of absolutism leads, already in this very restricted purely logical environment, to unavoidable auto-destruction by contradiction. It is then not difficult to argue that any more sophisticated system of truth values should at least contain the extremely simple, immediate and straight logical framework just described, since the latter is only based on the most elementary rules of truth derivation (modus ponendo ponens), a rule that one cannot avoid accepting without dire consequences (and where counting is concerned, most people can count as well—the other necessary assumption). It also shows, perhaps more importantly, that Gödel's so called absolute statement "there is no absolute logic system", makes eminent sense because the opposite assertion is self-destructive.

How can that be? Does Gödel's presumed absolute statement not contradict itself? The solution of the paradox is, of course, that Gödel's theorem is only absolute within the very restrictive context of straight and basic logical thinking (the modus ponendo ponens logic), and, moreover, it is absolute only in a negative sense, it only negates absolutism, while the opposite statement (e.g., that there is a universal logic[8]) largely extends beyond the restricted context of second-order logic—that is the essence of Gödel's incompleteness theorems. It is not hard to validate so-called absolute statements that negate claims of absolutely valid properties. One only has to provide one specific instance in which the absolute claim fails[9], and that surely invalidates a universal statement *within a given system.* However, the claim of 'absolute truth' reaches (far) beyond the system of thought used, perhaps sureptitiously. Modern physics does claim some absolutes, but those are very sturdy laws of nature that need careful proof and extreme verification. For example, physics claims that there exists an absolute zero of temperature[10] (0 degree Kelvin = -273.15 degrees Celsius), that the speed of light in vacuo is maximal but limited to 299 792 458 m/s in any inertial frame of reference, and that some complicated natural constants exist such as the basic quantum mechanical constant h, which, by the way, can be put equal to 1 (or 2π) when an adequate choice of fundamental units is made. These absolute statements do not exceed the boundaries of

[8] As seemingly Hilbert thought.

[9] The second order logic rule applies: $\sim \forall = \exists \sim$—'not valid for all' is the same as 'there is one that fails'.

[10] Even this 'absolute' is dependent on the basic assumptions made in thermodynamics, in particular what can be understood by 'complete statistical rest'. A difficult notion in a universe where everything is moving!

the framework in which they are asserted, but they are dependent on that framework anyway (for example, on the definition of temperature, distance or time).

One could posit the rule "the more limited the context, the stronger the claimed truths can be". Once I had a discussion with a philosopher who fully disagreed with my relativism and asked me, "Would you even doubt that two plus two is four?" Well, of course I do, for various reasons, which I briefly explain (please skip this paragraph if you are not interested in this issue). There is nothing universal about that statement. It is totally context dependent. For one thing, one has to give meaning to the words 'two', 'four' and 'plus', and just what these sounds conjure in somebody's mind is already dependent on the person's particulars. Once that is settled, the number system used may come into play, but that may be thought to be implicit in the definition of the numbers. In the Zermelo-Frankel system, one actually proves that 2+2=4. After having disposed of all the definitions of numbers and the fundamental counting rules, the proof uses the axioms to move the brackets: 2+2=2+(1+1)=(2+1)+1=3+1=4, using the recursive definition of subsequent numbers as well (the sixth axiom in the system). This whole construct sits already deep in the carefully constructed Zermelo-Frankel theory. There is nothing 'natural' about it!

The relativity of the situation is even more clear in geometry. Pythagoras' theorem for a right angle triangle ($c^2 = a^2 + b^2$) was thought to be a "law of nature" until the end of the nineteenth century, when Riemann discovered that it is just a characteristic of a type of space that is "uniformly flat" (the illusion of uniformity or "symmetries" permeates thinking and mathematics). The theorem does not hold in a curved space, even one that is uniform, such as on a sphere (easy to see, just take two different polar great circles and the piece of equator between them and Pythagoras breaks down). The philosopher I was talking about, when presented with such a case, told me, "So you see, even mathematics changes with time. What was true until the end of the 19th century is not true anymore[11]". Nowadays economists tell us that two plus two is more than four, e.g., joining efforts achieves more than what individuals can do on their own (this assessment actually goes back to Aristotle, I am told). The statement "$2 + 2 = 4$" also runs into problems with semantics, or, if you prefer, the context. If I say that two jackets plus two jackets are four jackets, then that might be true for the accounting department taking the shop's inventory. But for a customer, one jacket may fit and another not, so how can they be added together and then split again to produce the same result? Even the

[11]Sorry, but that beats my understanding! Although I believe in things changing, logic does not change that quickly!

symbols 2 and 2 consist of different blots of ink. Sorry for this diversion, but I wanted to make the point evidently clear. Numbers, circles, spheres, propositions etc. are constructs of the mind.

So, and as Socrates rightfully feared, language allows us to produce absolutes that do not actually 'exist'. I shall go extensively into this issue when we talk about abstraction. For now, having accepted that there are no such things as absolute truths except for a few negative results that are absolutely certain in their extremely limited context, let us move on to a more constructive approach and show, on the positive side, that a relativistic approach opens up a wide area of novel thought and possibilities.

When a religious authority states "these are the ten commandments God has ordained", then that seems to stop any potential discussion on ethics at that point. God has ordained the ethics and no mortal can dispute it. But, as we all know, even religious discussions do not stop with the formulation of commandments. They just move to another level, namely their interpretation. No wonder much religious literature is filled with interpretative considerations, rule setting by authority etc. Some especially dogmatic religions, such as Catholicism, even claim a monopoly of interpretation as though God is immanent in their leadership, which then has received from Him the sole authority to translate His commandments to daily practice. Such a claim actually degrades the commandments to just a delegation or even usurpation of authority.

At this point 'reality' makes a glorious entrance. There is a great discrepancy between any abstraction (such as a commandment, a law of physics, or a number) and the reality it is supposed to cover. Words, sentences, thoughts, laws are all in our brains and nowhere else, even how we connect their content with what we think of 'reality'. For many people the connection is immediate. It makes daily life possible. But that does not mean it covers reality correctly or even adequately. Even as we saw with just the elementary numbers, we as humans have created them. One does not need to be a dualist in the traditional sense, thinking that human thought in some way does not belong to nature (the terms 'reality' and 'nature' need clarification, but at this point I use them in their normal or naive sense: reality as how nature manifests itself to me in my present space and time), but it is pretty clear that the human capacity for thought is a specific process necessary to produce those abstractions (we shall discuss the biological emergence of this process later in the chapter on evolution). Nature reveals itself through our observations, but that does not mean that the results of human based abstraction processes are faithful representations of nature.

Even when we just sense, we abstract. We connect similar sensations to a notion, e.g., the tactile sensation of warmth or hardness. In the opposite direction, one could say that warmth is the abstraction connected to a

certain type of tactile sensation. Abstracting further, we develop theories about warmth, we order the sensations around our "understanding", and then start assuming that this construct 'is' actually reality. In daily life this process works well, and allows us to obtain a definite control over at least part of our environment. We connect "making fire" with "producing warmth", and when we feel cold we know what to do. The problem is that the value of abstraction only goes as far as it survives the test with reality. From our understanding of the structure of human brains (or brains in general), we know that more than 90% of one brain's neural connections are of the "feedback" nature, permanently testing whether abstractions pan out according to some way of experiencing (and interpreting the experience), and suppressing them when they do not. *That* is the daily working practice. Our brains 'know' unconsciously that they do not know, therefore they must test permanently.

Even so, the abstraction process often goes astray, none of the biological mechanisms that it uses is perfect, and the higher the abstraction, the more difficult is the testing of its compliance with perceived reality. The reason for this is simply statistical. Higher abstractions are supposed to cover much larger sets of phenomena. To validate them, a much larger testing field is needed and the chance that the test will fail increases. On simple experiences we perform simple testing, such as, "I just thought I saw a horse but now I realize it was a donkey" (because I tested the hypothesis 'horse' and figured out that the ears of the animal were longer than expected). Similarly, we may have restricted the set of possibilities too much. When I believe 'trees have leaves' and I encounter one without, it will not shake my belief, but I shall look for another cause of the phenomenon. Any abstraction needs continuous testing, hence it needs a field against which it can be tested. One could say, "it needs a context", but that is just a weak way of stating it. What it actually needs is access to the whole reality of its claims, *which it does not actually have except partially and sporadically.*

Abstraction generalizes by omission. Details disappear. But that is exactly where the danger lies. There are many ways in which generalizations are possible and they are not necessarily compatible with each other. Modern physics had to learn to live with such a situation. A particle can be interpreted as a wave and conversely waves can be viewed as particles. The viewpoints are not quite compatible. Physicists call them "complementary". They allow themselves to change interpretation whenever the results of experiments require. They say, "electron interference phenomena are explained by the wave-like nature of the electron", while its mass is "explained by its particle-like nature". In modern quantum physics these points of view can be made coherent with some sophisticated mathematical work, a few more hypotheses, and a new definition of what a 'particle' is.

Certain religions are very good at complex explanations as well: "Jesus Christ is at the same time human and divine." An acute question then arises immediately, "What is the meaning of such statements?" I shall devote a chapter to the hugely important and often neglected or even despised question of meaning or semantics, but it should be clear at this point that it is the confrontation with reality that provides the need for a shift in premisses. The subsequent experiments, as with the electron, make the shift of background framework necessary to explain the phenomenon.

The 'reality' offered by nature provides for the context against which any abstraction has to be tested, but that experimental process requires human intervention as well. The abstraction itself also belongs to nature, as it sits in our brains, but compared to all the other things that 'exist', it is a very tiny type of existence and very well hidden from the rest of nature. An assertion one would be tempted to make is, "Nature provides itself for the absolute framework!", the only problem being to discover it. But this would be a mistake. We have the tendency to view nature as "the all", but from our previous discussion we know that there cannot be a description *that can grasp the whole*. The situation is somewhat comparable to infinity in mathematics. We can set up rules to go beyond where we are, but we cannot 'grasp the whole' except as an abstraction, for which only non-comprehensive constructive statements are possible. There will always be an ungraspable "beyond". Once well understood, this situation, common in mathematics, becomes nonproblematic. Actually, and as we saw already, the problems arise when we do not accept it. There is no such being as Atlas bearing the whole world on his shoulders, certainly not a concrete one and not even an abstract one.

Although all this may seem mysterious, it is only mysterious for those who think in absolute terms. The way out of the dilemma, if there is any dilemma, is to keep the connection to reality in mind, and force oneself to always double check against the contextual assumptions one has made. One might call such an approach 'phenomenology', although there are differences with the classical term as used by Heidegger. Moving towards ethics, one could also say that the approach becomes a kind of 'consequentialism'. At each step of the reasoning one has to keep track of the consequences the recipes, rules or conclusions have. This then goes in the direction of "the results justify the means", but I shall show in the chapters on ethics, that this is not the case when one approaches the issue correctly, i.e., by not succumbing to the temptation of hidden absolutism (or fundamentalism).

The way to proceed is then very much as what one does when one builds a theory in mathematical physics. One starts out with a basis consisting of what is meant by an acceptable derivation and by a consistent set of basic axioms (unproven but plausible assumptions), and then moves into deriving