

SOFTWARE AND MIND

by Andrei Sorin

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and the introductory chapter, "Belief and Software"**

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The chapter is an introduction to the mechanistic myth and the mechanistic software myth, and an analysis of the similarity of software-related beliefs to primitive beliefs.

SOFTWARE
AND
MIND

The Mechanistic Myth
and Its Consequences

Andrei Sorin

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Don't you see that the whole aim of Newspeak is to narrow the range of thought?... Has it ever occurred to you ... that by the year 2050, at the very latest, not a single human being will be alive who could understand such a conversation as we are having now?

George Orwell, *Nineteen Eighty-Four*

Disclaimer

This book attacks the mechanistic myth, not persons. Myths, however, manifest themselves through the acts of persons, so it is impossible to discuss the mechanistic myth without also referring to the persons affected by it. Thus, all references to individuals, groups of individuals, corporations, institutions, or other organizations are intended solely as examples of mechanistic beliefs, ideas, claims, or practices. To repeat, they do not constitute an attack on those individuals or organizations, but on the mechanistic myth.

Except where supported with citations, the discussions in this book reflect the author's personal views, and the author does not claim or suggest that anyone else holds these views.

The arguments advanced in this book are founded, ultimately, on the principles of demarcation between science and pseudoscience developed by Karl Popper (as explained in "Popper's Principles of Demarcation" in chapter 3). In particular, the author maintains that theories which attempt to explain non-mechanistic phenomena mechanistically are pseudoscientific. Consequently, terms like "ignorance," "incompetence," "dishonesty," "fraud," "corruption," "charlatanism," and "irresponsibility," in reference to individuals, groups of individuals, corporations, institutions, or other organizations, are used in a precise, technical sense; namely, to indicate beliefs, ideas, claims, or practices that are mechanistic though applied to non-mechanistic phenomena, and hence pseudoscientific according to Popper's principles of demarcation. In other words, these derogatory terms are used solely in order to contrast our world to a hypothetical, ideal world, where the mechanistic myth and the pseudoscientific notions it engenders would not exist. The meaning of these terms, therefore, must not be confused with their informal meaning in general discourse, nor with their formal meaning in various moral, professional, or legal definitions. Moreover, the use of these terms expresses strictly the personal opinion of the author – an opinion based, as already stated, on the principles of demarcation.

This book aims to expose the corruptive effect of the mechanistic myth. This myth, especially as manifested through our software-related pursuits, is the greatest danger we are facing today. Thus, no criticism can be too strong. However, since we are all affected by it, a criticism of the myth may cast a negative light on many individuals and organizations who are practising it unwittingly. To them, the author wishes to apologize in advance.

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Preface

The book's subtitle, *The Mechanistic Myth and Its Consequences*, captures its essence. This phrase is deliberately ambiguous: if read in conjunction with the title, it can be interpreted in two ways. In one interpretation, the mechanistic myth is the universal mechanistic belief of the last three centuries, and the consequences are today's software fallacies. In the second interpretation, the mechanistic myth is specifically today's mechanistic *software* myth, and the consequences are the fallacies *it* engenders. Thus, the first interpretation says that the past delusions have caused the current software delusions; and the second one says that the current software delusions are causing further delusions. Taken together, the two interpretations say that the mechanistic myth, with its current manifestation in the software myth, is fostering a process of continuous intellectual degradation – despite the great advances it made possible. This process started three centuries ago, is increasingly corrupting us, and may well destroy us in the future. The book discusses all stages of this degradation.

The book's epigraph, about Newspeak, will become clear when we discuss the similarity of language and software (see, for example, pp. 411–413).

Throughout the book, the software-related arguments are also supported with ideas from other disciplines – from philosophy, in particular. These discussions are important, because they show that our software-related problems

are similar, ultimately, to problems that have been studied for a long time in other domains. And the fact that the software theorists are ignoring this accumulated knowledge demonstrates their incompetence. Often, the connection between the traditional issues and the software issues is immediately apparent; but sometimes its full extent can be appreciated only in the following sections or chapters. If tempted to skip these discussions, remember that our software delusions can be recognized only when investigating the software practices from this broader perspective.

Chapter 7, on software engineering, is not just for programmers. Many parts (the first three sections, and some of the subsections in each theory) discuss the software fallacies in general, and should be read by everyone. But even the more detailed discussions require no previous programming knowledge. The whole chapter, in fact, is not so much about programming as about the delusions that pervade our programming practices. So this chapter can be seen as a special introduction to software and programming; namely, comparing their true nature with the pseudoscientific notions promoted by the software elite. This study can help both programmers and laymen to understand why the incompetence that characterizes this profession is an inevitable consequence of the mechanistic software ideology.

There is some repetitiveness in the book, deliberately introduced in order to make the individual chapters, and even the individual sections, reasonably independent. Thus, while the book is intended to be read from the beginning, you can select almost any portion and still follow the discussion. An additional benefit of the repetitions is that they help to explain the more complex issues, by presenting the same ideas from different perspectives or in different contexts.

The book is divided into chapters, the chapters into sections, and some sections into subsections. These parts have titles, so I will refer to them here as *titled* parts. Since not all sections have subsections, the lowest-level titled part in a given place may be either a section or a subsection. This part is, usually, further divided into *numbered* parts. The table of contents shows the titled parts. The running heads show the current titled parts: on the right page the lowest-level part, on the left page the higher-level one (or the same as the right page if there is no higher level). Since there are more than two hundred numbered parts, it was impractical to include them in the table of contents. Also, contriving a short title for each one would have been more misleading than informative. Instead, the first sentence or two in a numbered part serve also as a hint of its subject, and hence as title.

Figures are numbered within chapters, but footnotes are numbered within the lowest-level titled parts. The reference in a footnote is shown in full only the first time it is mentioned within such a part. If mentioned more than once,

in the subsequent footnotes it is usually abbreviated. For these abbreviations, then, the full reference can be found by searching the previous footnotes no further back than the beginning of the current titled part.

The statement “italics added” in a footnote indicates that the emphasis is only in the quotation. Nothing is stated in the footnote when the italics are present in the original text.

In an Internet reference, only the site’s main page is shown, even when the quoted text is from a secondary page. When undated, the quotations reflect the content of these pages in 2010 or later.

When referring to certain individuals (software theorists, for instance), the term “expert” is often used mockingly. This term, though, is also used in its normal sense, to denote the possession of true expertise. The context makes it clear which sense is meant.

The term “elite” is used to describe a body of companies, organizations, and individuals (for example, the software elite); and the plural, “elites,” is used when referring to several entities, or groups of entities, within such a body. Thus, although both forms refer to the same entities, the singular is employed when it is important to stress the existence of the whole body, and the plural when it is the existence of the individual entities that must be stressed. The plural is also employed, occasionally, in its normal sense – a group of several different bodies. Again, the meaning is clear from the context.

The issues discussed in this book concern all humanity. Thus, terms like “we” and “our society” (used when discussing such topics as programming incompetence, corruption of the elites, and drift toward totalitarianism) do not refer to a particular nation, but to the whole world.

Some discussions in this book may be interpreted as professional advice on programming and software use. While the ideas advanced in these discussions derive from many years of practice and from extensive research, and represent in the author’s view the best way to program and use computers, readers must remember that they assume all responsibility if deciding to follow these ideas. In particular, to apply these ideas they may need the kind of knowledge that, in our mechanistic culture, few programmers and software users possess. Therefore, the author and the publisher disclaim any liability for risks or losses, personal, financial, or other, incurred directly or indirectly in connection with, or as a consequence of, applying the ideas discussed in this book.

The pronouns “he,” “his,” “him,” and “himself,” when referring to a gender-neutral word, are used in this book in their universal, gender-neutral sense. (Example: “If an individual restricts himself to mechanistic knowledge, his performance cannot advance past the level of a novice.”) This usage, then, aims solely to simplify the language. Since their antecedent is gender-neutral (“everyone,” “person,” “programmer,” “scientist,” “manager,” etc.), the neutral

sense of the pronouns is established grammatically, and there is no need for awkward phrases like “he or she.” Such phrases are used in this book only when the neutrality or the universality needs to be emphasized.

It is impossible, in a book discussing many new and perhaps difficult concepts, to anticipate all the problems that readers may face when studying these concepts. So the issues that require further discussion will be addressed online, at www.softwareandmind.com. In addition, I plan to publish there material that could not be included in the book, as well as new ideas that may emerge in the future. Finally, in order to complement the arguments about traditional programming found in the book, I plan to publish, in source form, some of the software applications I developed over the years. The website, then, must be seen as an extension to the book: any idea, claim, or explanation that must be clarified or enhanced will be discussed there.

INTRODUCTION

Belief and Software

This book is largely a study of delusions – mechanistic delusions. But, whereas in the following chapters we discuss the *logical* aspects of these delusions, in this introductory chapter we concentrate on their *human* aspects.

Belief, as we all know, is stronger than reason. For a person who believes that the number 13 brings misfortune, a hundred logical arguments demonstrating the fallacy of this idea amount to nothing; at the same time, one story of an accident that occurred on the 13th day of a month suffices to validate the idea. Similarly, we will see, it is quite easy to expose the absurdity of the *mechanistic* beliefs. Yet hundreds of millions of people – people who think of themselves as modern and rational – spend a great part of their life engaged in activities that are, essentially, an enactment of these beliefs. Clearly, it would be futile to attempt to understand the mechanistic myth without taking into account its emotional roots.

It is in order to emphasize their primacy, therefore, that I deal with the human aspects of the mechanistic myth before its logical aspects. But this book is concerned, ultimately, with logical thinking. Thus, a second reason for including the study of human nature in the introduction is that it is only a brief discussion of this important topic.

Modern Myths

The historian of religions Mircea Eliade predicts that “the understanding of myth will one day be counted among the most useful discoveries of the twentieth century.”¹ Myths used to be considered – along with fairy tales, legends, and fables – merely folklore: picturesque stories transmitted to us from ancient times, perhaps carrying some moral lessons, but generally of little value in the modern world. It is only recently, starting with the work of anthropologists like Bronislaw Malinowski, that we have come to view myths in a new light. These scholars studied the life of primitive societies extant in various parts of the world by living among those people and learning their languages and customs. As these cultures exemplify all early societies, this information, combined with our historical knowledge, has helped us to form a more accurate picture of the capabilities, values, and beliefs of archaic man. Even more importantly, it has helped us to understand the development and nature of our own, present-day culture.

One thing we have discovered from these studies is the critical function that myth fulfills in a human society. Myth, according to Malinowski, “supplies the charter for ritual, belief, moral conduct and social organization.”² Far from being simply folklore, myths are the foundation upon which the entire social system rests: “Studied alive, myth ... is not symbolic, but a direct expression of its subject matter; it is ... a narrative resurrection of a primeval reality, told in satisfaction of deep religious wants, moral cravings, social submissions, assertions, even practical requirements. Myth fulfills in primitive culture an indispensable function: it expresses, enhances, and codifies belief; it safeguards and enforces morality; it vouches for the efficiency of ritual and contains practical rules for the guidance of man. Myth is thus a vital ingredient of human civilization; it is not an idle tale, but a hard-worked active force.”³

It is wrong to study a myth by inquiring whether it makes sense. Myths are a sacred tradition, and “the main object of sacred tradition is not to serve as a chronicle of past events; it is to lay down the effective precedent of a glorified

¹ Mircea Eliade, *Myths, Dreams, and Mysteries: The Encounter between Contemporary Faiths and Archaic Realities* (New York: Harper and Row, 1975), p. 38.

² Bronislaw Malinowski, “Myth as a Dramatic Development of Dogma,” in *Malinowski and the Work of Myth*, ed. Ivan Strenski (Princeton, NJ: Princeton University Press, 1992), p. 122.

³ Bronislaw Malinowski, *Magic, Science and Religion, and Other Essays* (Garden City, NY: Doubleday Anchor, 1954), p. 101.

past for repetitive actions in the present.”⁴ We must study, therefore, not so much the *text* of a story or legend, as its effects on living society. Myths make absurd claims, but we must ignore their scientific inaccuracy. The “extravagant elements in the myth ... can only be understood by reference to ritual, ethical, and social influences of the story on present day conduct.”⁵

A myth, then, must be judged solely by its power to inspire large numbers of people. Blatant impossibilities or inconsistencies do not detract from its power. On the contrary, since it is precisely the fantastic elements in a myth that impress us, they are its most important value. Thus, a story that makes only reasonable and verifiable claims cannot possibly serve as myth.

Eliade notes how quickly our perception of the function of myth has changed, from the belief that it is “only fables,” to the appreciation that “a man of the traditional societies sees it as the *only valid revelation of reality*.”⁶ The function of myth is the exact opposite of what we thought it to be: rather than relying on proven knowledge in their important activities and turning to myths in their diversions, it is actually in their important activities that the primitives rely on myths. Because they are inherited from previous generations, myths are believed to represent unquestionable facts: “The myth is thought to express *absolute truth*, because it narrates a *sacred history*. ... Being *real* and *sacred*, the myth becomes exemplary, and consequently *repeatable*, for it serves as a model, and by the same token as a justification, for all human actions.”⁷ Conversely, something that is not reflected in myths is deemed to be untrue and profane.

The greatest benefit that emerges from the study of myth is not a better understanding of primitive cultures, but a better understanding of our own, modern culture. We must “integrate the myth into the general history of thought, by regarding it as the most important form of collective thinking. And, since ‘collective thinking’ is never completely abolished in any society, whatever its degree of evolution, one did not fail to observe that the modern world still preserves some mythical behaviour.”⁸ Thus, “*upon the plane of social living*, there was no break in the continuity between the archaic world and the modern world.”⁹

But there seem to be few myths left in the modern world. Moreover, those that still exist do not seem to provide anywhere near the powerful inspiration that myths provided in earlier civilizations. So this important question arises: “If the myth is not just an infantile or aberrant creation of ‘primitive’ humanity, but is the expression of *a mode of being in the world*, what has become of myths

⁴ Malinowski, “Dramatic Development,” p. 123.

⁶ Eliade, *Myths, Dreams, and Mysteries*, p. 24.

⁸ *Ibid.*, p. 24.

⁹ *Ibid.*

⁵ *Ibid.*

⁷ *Ibid.*, p. 23.

in the modern world? Or, more precisely, what has taken the *essential* place occupied by myth in traditional societies?”¹⁰ “It seems unlikely that any society could completely dispense with myths, for, of what is essential in mythical behaviour – the exemplary pattern, the repetition, the break with profane duration and integration into primordial time – the first two at least are cosubstantial with every human condition.”¹¹

The absence of myths in modern society, thus, is an illusion. In reality, because human nature has not changed, modern cultures too are founded on myths. All that has happened is a shift in the type of myths that inspire us: our preoccupations are different from those of our ancestors, so our myths too are different. It is a mistake to study the *old* myths, and to conclude that, since we no longer take *them* seriously, we no longer depend on myths.

To understand the mass delusions that possess our present-day society, we must uncover the myths that shape our collective thinking *today*. Let us briefly review some of these myths.



George Steiner refers to the intellectual, political, and social ideologies of the nineteenth and twentieth centuries as surrogate creeds, anti-theologies, meta-religions, or mythologies.¹² These ideologies emerged as a result of the decline of formal religion since the Renaissance. Thanks to the growth of knowledge, Western man’s absolute belief in God, which had guided him for centuries, suddenly came to an end. This created a spiritual vacuum and the longing for a new, equally powerful subject of belief: “Where there is a vacuum, new energies and surrogates arise. Unless I read the evidence wrongly, the political and philosophic history of the West during the last 150 years can be understood as a series of attempts – more or less conscious, more or less systematic, more or less violent – to fill the central emptiness left by the erosion of theology.”¹³

Steiner discusses three ideologies: Marxism, Freudian psychoanalysis, and Lévi-Strauss’s structuralism. These systems of ideas have several characteristics in common: “totality, by which I simply mean the claim to explain everything; canonic texts delivered by the founding genius; orthodoxy against heresy; crucial metaphors, gestures, and symbols.”¹⁴ And it is these characteristics that betray their mythological nature: “The major mythologies constructed in the

¹⁰ Ibid.

¹¹ Ibid., p. 31.

¹² George Steiner, *Nostalgia for the Absolute* (Toronto: CBC Enterprises, 1974), p. 2.

¹³ Ibid.

¹⁴ Ibid., p. 4. We will also encounter these three ideologies in chapter 3, where we will see that, unsurprisingly, they are based on pseudoscientific theories.

West since the early nineteenth century are not only attempts to fill the emptiness left by the decay of Christian theology and Christian dogma. They are themselves a kind of *substitute theology*. They are systems of belief and argument which may be savagely anti-religious, which may postulate a world without God and may deny an afterlife, but whose structure, whose aspirations, whose claims on the believer, are profoundly religious in strategy and in effect.”¹⁵

Isaiah Berlin¹⁶ shows that, in their attempt to explain social evolution “scientifically,” the modern social theories were compelled to ignore the role played by individuals. Human history, according to these theories, is controlled by some mysterious forces and processes – variously represented as class struggles, cultural clashes, geo-political conditions, technological changes, etc. While described in scientific terms, these mighty forces and processes are perceived as supernatural, mythological entities. They manage to explain social evolution only by remaining unexplained themselves, so in the end, these theories – in reality, pseudosciences – are no different from the religious beliefs of the past: “There has grown up in our modern time a pseudo-sociological mythology which, in the guise of scientific concepts, has developed into a new animism – certainly a more primitive and naive religion than the traditional European faiths which it seeks to replace.”¹⁷

Eliade compares the modern political myths with the classical myths: “Eschatological and millennialist mythology recently reappeared in Europe in two totalitarian political movements. Although radically secularized in appearance, Nazism and Communism are loaded with eschatological elements: they announce the end of this world and the beginning of an age of plenty and bliss.”¹⁸

Both Communism and Nazism were seen by their followers as the modern equivalent of the struggle between good and evil – a common mythological theme. Communism is based on “one of the great eschatological myths of the Middle Eastern and Mediterranean world, namely: the redemptive part to be played by the Just (the ‘elect,’ the ‘anointed,’ the ‘innocent,’ the ‘missioners,’ in our own days by the proletariat), whose sufferings are invoked to change the ontological structure of the world. In fact, Marx’s classless society, and the consequent disappearance of all historical tensions, find their most exact precedent in the myth of the Golden Age which, according to a number of traditions, lies at the beginning and the end of History.”¹⁹

¹⁵ Ibid.

¹⁶ Isaiah Berlin, “Historical Inevitability,” in *Four Essays on Liberty* (Oxford: Oxford University Press, 1969).

¹⁷ Ibid., p. 110.

¹⁸ Mircea Eliade, *Myth and Reality* (New York: Harper and Row, 1975), p. 69.

¹⁹ Eliade, *Myths, Dreams, and Mysteries*, pp. 25–26.

As for the other great political myth of the twentieth century, “in its effort to abolish Christian values and rediscover the spiritual sources of the ‘race’ – that is, of Nordic paganism – Nazism was obliged to try to reanimate the Germanic mythology.”²⁰ Thus, “the ‘Aryan’ represented at once the ‘primordial’ Ancestor and the noble ‘hero,’ ... the exemplary model that must be imitated in order to recover racial ‘purity,’ physical strength, nobility, the heroic ‘ethics’ of the glorious and creative ‘beginnings.’”²¹

Some of our myths are embodied in literary works, movies, television shows, sports, and popular entertainment. Archaic societies had no need for such distractions, because in their normal life – daily work, hunting, war, family and social activities – they were constantly reenacting sacred myths. Having desacralized our world, and especially our work, we had to invent some useless activities, collective and personal, as substitutes for the reenactment of myths.²²

For example, a popular myth in current American culture is the myth of the lone saviour: “A community in a harmonious paradise is threatened by evil: normal institutions fail to contend with this threat: a selfless superhero emerges to renounce temptations and carry out the redemptive task: aided by fate, his decisive victory restores the community to its paradisaical condition: the superhero then recedes into obscurity.”²³ Variations of this myth form the main theme in countless movies and television series, and its popularity can be explained by comparing it with the old religious myths: “The supersaviors in pop culture function as replacements for the Christ figure, whose credibility was eroded by scientific rationalism. But their superhuman abilities reflect a hope for the divine, redemptive powers that science has never eradicated from the popular mind. The presentation of such figures in popular culture has the power to evoke fan loyalties that should be compared with more traditional forms of religious zeal.”²⁴

Similarly, “the characters of the comic strips present the modern version of mythological or folklore Heroes.”²⁵ For instance, “the myth of Superman satisfies the secret longings of modern man who, though he knows that he is a fallen, limited creature, dreams of one day proving himself an ‘exceptional person,’ a ‘Hero.’”²⁶

Cultural fashions – in literature, art, music, philosophy, even science – act in effect as modern mythologies: “One of the fascinating aspects of the ‘cultural fashion’ is that it does not matter whether the facts in question and their

²⁰ Ibid., p. 26.

²¹ Eliade, *Myth and Reality*, p. 183.

²² Eliade, *Myths, Dreams, and Mysteries*, p. 37.

²³ Robert Jewett and John S. Lawrence, *The American Monomyth* (Garden City, NY: Anchor/Doubleday, 1977), p. xx.

²⁴ Ibid.

²⁵ Eliade, *Myth and Reality*, pp. 184–185.

²⁶ Ibid., p. 185.

interpretation are true or not. No amount of criticism can destroy a vogue. There is something ‘religious’ about this imperviousness to criticism.... Their popularity, especially among the intelligentsia, reveals something of Western man’s dissatisfactions, drives, and nostalgias.”²⁷

Paul Kurtz²⁸ discusses the similarities between classical religions and modern belief systems. He accepts the fact that human beings are susceptible to irrational beliefs, that we are possessed by a “transcendental temptation.” But, he says, we must find a way to overcome this weakness, because a society dominated by myths faces great dangers: “The transcendental temptation lurks deep within the human breast. It is ever-present, tempting humans by the lure of transcendental realities, subverting the power of their critical intelligence, enabling them to accept unproven and unfounded myth systems. Can we live without myths? Can we overcome the defect, as it were, in our natures? Is it so rooted in our natures that it cannot be overcome, but will crop up in generation after generation, the forms and functions of the transcendental temptation the same, with only the content different?”²⁹

Although the growth of science seems to offer a hope for overcoming it, we must remember that “these are relatively recent developments and of short duration in human history.... The transcendental temptation has held sway for millennia, and to hope to mitigate or obviate its continued power may be to engage in wishful thinking.... What guarantee do we have that science too will not be overwhelmed and superseded by new faiths of unreason commanding human imagination?... One cannot predict the future course of human history with any degree of confidence. Regrettably, often the unthinkable becomes true. Will the unimaginable again overtake us, as we slip into a new dark age of unreason? The only option for us to prevent this is to continue to use the arts of intelligence and skeptical criticism against the blind faiths, old and new.... Is there any hope that a scientific, secular, or humanist culture can develop and prevail, devoid of transcendental myths?... If salvation myths are no longer tenable, what will take their place? The dilemma is always that new faiths and new myths may emerge, equally irrational.”³⁰

Science, however, has been redefined in our universities to mean a blind pursuit of mechanistic theories – whether sound or not, whether useful or not. Science, thus, has *already* been “overwhelmed and superseded by new faiths of unreason” – by the mechanistic dogma. *The mechanistic belief is the new myth that has emerged to replace the old ones.*

²⁷ Mircea Eliade, *Occultism, Witchcraft, and Cultural Fashions: Essays in Comparative Religions* (Chicago: University of Chicago Press, 1978), p. 3.

²⁸ Paul Kurtz, *The Transcendental Temptation: A Critique of Religion and the Paranormal* (Buffalo, NY: Prometheus Books, 1991).

²⁹ *Ibid.*, pp. 477–478.

³⁰ *Ibid.*, pp. 481–482.