

PRIKAZ KNJIGE**BOOK REVIEW**

Ante Simonić

*Tracing Knowledge into the Future – Quo vadis scientia?
(Part I)*

[*Tragovima znanja u budućnost – Quo vadis scientia?]*

University of Rijeka and Vitagraf d.o.o., Rijeka, 1999
ISBN 953-6059-26-2

*Civilizational Boundaries of Knowledge – Mysteries of Culture
throughout History (Part II, 2 volumes)*

[*Civilizacijske razmeđe znanja – Misterije kulture tijekom povijesti]*

University of Rijeka and Vitagraf d.o.o., Rijeka, 2000
ISBN 953-6059-27-4

*Science – The Greatest Adventure and Challenge of Mankind
(Part III)*

[*Znanost – Najveća avantura i izazov ljudskog roda]*

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This capital work, trilogy on science in four volumes, which gives a survey of the development of civilization as catalyzed by the development of science, was written by Dr. Ante Simonić, full professor at the Faculty of Medicine in Rijeka, currently a member of the Croatian Parliament and chairman of the parliamentary Committee for Education, Science and Culture. There are few so comprehensive works on the history of civilization, culture and science. Not many authors anywhere in the world are ready to undertake such complex tasks as writing books-syntheses. Major works of this kind in Croatia include, for example, Josip Horvat, *1000 Years of Croatian Culture* in two volumes (Globus, Zagreb, 1980, reprint), Zvane Črnja,

Cultural History of Croatia: Ideas – Personalities – Works (Epoha, Zagreb, 1965), Slavko Batusić, *Art in Picture – A Survey of the History of Art* (Matica hrvatska, Zagreb, 1967). There are more of the kind in the world, but not too many. It was long ago that I read some of them, such as Will Durant, *The Story of Philosophy* (Simon and Schuster, New York, 1926); E. H. Gombrich, *The Story of Art* (Phaidon, New York, 1951, 4th revised edition. This work has only recently been translated into Croatian.); J. Semjonov, *Global Wealth – Economic Geography for Everybody* (Minerva, Zagreb, 1937); Hendrik Willem van Loon, *The Arts of Mankind* (Minerva, Zagreb, 1939); Kenneth Clark, *Civilisation* (BBC and John Murray, London, 1969). Appearance of this very readable trilogy on science is therefore an outstanding cultural event. Reading Simonić's trilogy is a real »reading feast« for everybody.

Chemistry features highly in the whole trilogy, since it is inconceivable to imagine a work on science and its influence on the development of civilization with no mention of chemical achievements, which substantially influenced this development. And as Linus Pauling (1901–1994), so far the only person who was awarded two unshared Nobel prizes (chemistry 1954, peace 1962), once said – nothing would be possible without chemistry.

In Part One of the trilogy, entitled *Tracing Knowledge into the Future* with the subtitle *Quo vadis scientia?* (Introduction, 8 chapters with 39 subchapters, Literature, Index, 645 pages and 400 literature citations), the author addresses topics of universal interest: origin and development of space (the big boom) and the earth, emergence and development of life (physical, chemical and biological evolution), appearance and development of man (development of the brain, speech), development of civilization (calendar, writing, education), development of philosophy (idealism, materialism, philosophy of science), logic (analysis, synthesis), science (physics, chemistry, biology) and mathematics. Different attitudes to life are discussed as well as work of learned people, but also their frequent inability to solve numerous problems that burden mankind. The message of the book is clear – mankind has no future without science and knowledge.

Each chapter and subchapter is accompanied with a quotation. Part One, and thereby also the whole trilogy, starts with Confucius' quotation: »Every journey starts with the first step«. One of the most beautiful quotations reads: »People are angels, but with only one wing. They will be able to fly if they are embraced by mutual compassion«. The author is, who else could it be, Mother Theresa. For financial reasons, Part One of the trilogy came off the presses after Part Three.

Chemistry explicitly features in the discussions, e.g. on molecular structure (p. 46), symmetry of the acid and the alkaline (p. 47), on what chemistry is (p. 56), chemical processes (p. 88), chemistry (and physics) as the basis

of the development of industry and technology (p. 275), chemistry in medicine and pharmacy (p. 410), chemical education (p. 476), etc.

The author divided Part Two of the trilogy, entitled *Civilizational Boundaries of Knowledge*, with the subtitle *Mysteries of Culture throughout History*, into two books and five sections (Foreword, 21 chapters with 104 subchapters, Literature, Index, 893 pages and 278 literature citations), which reflect historical steps in the development of mankind and science. This part of the trilogy was the last to come off the presses.

In the first section under the title »*Pre-science Period of Mankind*«, the author offers a historical survey of the development of the early states (Mesopotamia, Egypt, Persia, India, China) and the old civilizations of Polynesia and America, as well as the early history of the Jews and the emergence of Christianity. In the second section, entitled »*Conditions are Created for Stepping into the Scientific Era*«, the author deals with the environments that influenced the development of the human race in such a way that their influence is still felt today: Greece – its influence is reflected in all human activities, from sports and arts to philosophy and science (Plato is still reputed as the most important thinker in history and, perhaps, the best European writer of all times), Phoenicia – left the legacy of the alphabet, Etruscans – their influence is indirect, since their script has not been deciphered to date, Rome – there is no need to spend words on describing all that Rome has left behind, Byzantium – influence on e.g. fashions and clothing, Arabs – brought to Europe the works of Greek philosophers, influenced the development of medicine and introduced a numerical system by far more advanced than the Roman one, early Europe up to the Crusades – influenced e.g. the development of university education.

In the third section under the title »*The Scientific Period of Mankind*«, the reader travels with the author through the Humanism, Renaissance and Reformation. He learns about the sudden boom of science (physics, mathematics, astronomy, medicine, alchemy), arts (Baroque, Rococo), music, architecture, etc. Europe gradually becomes the civilizational center of the world. In the fourth section entitled »*Science Becomes One of the Leading Civilizational Determinants*«, the author leads the reader into the modern era, which started with the founding of the United States of America and the French Revolution. Rapid development is recorded in all natural sciences and the industrial revolution is in full swing. Social sciences, arts, music, literature, architecture, etc. reach unimagined peaks. And then the First and Second World Wars turn the clock backwards. These unfortunate wars, instances of human folly, are followed by undreamed-of technological development, on the one side, including creation of terrible weapons for mass destruction while, on the other side, natural and social sciences finally

reach maturity and try to resist the pressures that led to the two world wars and many local wars. This extensive book ends with the section entitled »*Diversity of the Encounters of the Ancient and the Contemporary – How to Go On?*«. How to overcome the opposites (west and east, Christianity and Islam, democracy and communism, obesity and starvation, *etc.*), which are still very pronounced and constitute a potential tinderbox? Where to go and how to get to a better tomorrow?

This part of the trilogy starts with a quotation of Thomas Aquinas (1225–1274): »Aspiration for chastity is inherent to man... All people by their very nature aspire after knowledge«. There is also the frequently cited quotation of George Santayana (1863–1952): »Those who cannot remember the past are condemned to repeat it«.

Many references are made to alchemy and chemistry, such as the beginning and development of alchemy (pp. 455–456, 794–795), Paracelsus is mentioned in many places (pp. 26, 455, 523–524, 782, 791, 795), relationship between alchemy and chemistry (pp. 794–795), chemistry in the 20th century (pp. 818–820), Lavoisier as the founder of modern chemistry (pp. 618–619), *etc.*

Part Three *Science* with the subtitle *The Greatest Adventure and Challenge of Mankind* (Foreword, 13 chapters with 55 subchapters, Literature, Index, 483 pages and 248 literature citations) deals with science, division of science, beginnings of science, development of science, goals of science, elements of discovering scientific truths, laws of nature and society, scientific method, organization of scientific work. The author speaks of the scientist as a human being subject to doubts, but also a patriotic person. The author does not hesitate to discuss the woman scientist and the reflection of her engagement on the family life. He speaks about the ways of communication and imparting the results of scientific work, and wonders whether quality can be measured. The end of the book exudes a certain dose of pessimism, since the author details the delusions and errors of science, as well as the problems of environmental protection. The reader is thus informed that science is not omnipotent but is still the mankind's best way into the future. Rather surprisingly for such a comprehensive and detailed survey of science, the author does not dedicate many words to the relationship between science and religion. In my opinion, *Science* is the best text in the Croatian language on this problem area and I strongly believe the book will be widely read and discussed.

Part Three of the trilogy abounds in quotations as well. It commences with the lengthy quotation on science from the book *Flowers and Soils* (Mladost, Beograd, 1982) by Đuro Šušnjić (b. 1934): »Science is a strange phenomenon in human experience – it is not an ideology but it defends its

interests; it is not politics but it makes fateful decisions; it is not law but it possesses strict norms; it is not ethics but it demands moral behaviour; it is not a religion but it believes in its method;...«, which is not given here in full because of its length. The saying of Nikša Allegretti (1920–1982): »Science is doubt« reflects an old quotation of Goethe (1749–1832): »With knowledge grows the doubt«. Discussing the boundaries of science, Simonić quotes an unknown author (perhaps a gifted medical student) (pp. 414–420): »If it is green and moves: biology, if it stinks: chemistry, if it does not work: physics, if it is incomprehensible: mathematics, if it makes no sense: economics and sociology, and all this together makes: medicine.«

Chemistry implicitly permeates the entire third part of the trilogy and is explicitly mentioned on many pages (20–21, 27, 43, 71–72, 76, 79, 164, 195, 381, 414).

Part Three was printed first. Financial problems connected with printing such a book are likely to be one of the reasons while the other reason is of a much nobler nature. Simonić runs a postgraduate course on science at the Faculty of Medicine in Rijeka. I think he published this part of the trilogy first to help his students prepare for the exams.

This trilogy contains something for everybody and represents a synthesis of the overall human knowledge with a view into the future. The author has to be congratulated on the invested hard work and knowledge. I hope many young people will read this trilogy. Young people are indispensable to science because science is the driving force of every country's development. The country that fails to recognize this fact will be reduced to the level of a banana republic. This was pointed out more than a century ago by the first president of the Croatian Academy of Sciences and Arts Franjo Rački (1828–1894).

At the end of the century, and the millennium, this book is just what was needed to summarize the contribution of science in the »century of science«, as it is often called, though the »century of wars« might be a more appropriate name. According to historians, not a single day of the 20th century has passed without some military conflict in some part of our planet. Local clashes are flaring even today in Asia, Africa and South America. Human race still seems to be far from civilized discussion about the contrarities and differences between people and nations.

It is difficult to find fault with such a valuable and extensive work. However, I think that more mention should have been made of Croatia and the Croats, notably the unavoidable Marulić, Držić, Petriš, Dominis, Mohorovičić, Prelog, Ružička. Thus, Prelog is mentioned in two places and there is no mention of Ružička, who should have been singled out as the first Croatian that was awarded the Nobel prize. Josip Rugjer Bošković came off slightly

better, he is mentioned in 11 places of the trilogy. If we do not highlight our prominent people, who will? Bošković will certainly be brought to prominence by the Italians, however naturally as an Italian. It is difficult to find an encyclopedia in the world that speaks of Bošković as a Croat. Even people who should know better do not mention Bošković's Croatian origin. For example, John D. Barrow, now professor of mathematical sciences in the Department of Applied Mathematics and Theoretical Physics at Cambridge University, writes rather carelessly in his book *Theories of Everything* (Vintage, London, 1992; page 17): »...Roger Boscovich. A Dalmatian Jesuit...«

In the case of Andrija Mohorovičić (Volosko, 1957 – Zagreb, 1936), the above words are unfortunately well supported by Robin Cook's recent novel *Abduction* (Pan Books, London, 2000). Robin Cook is a medical doctor and the best-selling author of 22 novels, e.g. *Coma*, *Godplayer*, *Harmful Intent*, *Contagion*, *Chromosome 6*, *Vector*, etc., several of which have been translated into Croatian. *Abduction* is an interesting science-fiction novel in which the Mohorovičić discontinuity (the name is properly spelled and the concept is correctly described) has a prominent place. I was, however, astonished by what the author said about the origin of the term 'Mohorovičić discontinuity' (page 130): »...its eponymous name came from the Serbian seismologist who'd discovered it.« I believe that Robin Cook was ill-advised in this respect. Therefore, whenever opportunity arises, we should point out the contributions by Croatian scientists in order to avoid misunderstandings like the above-mentioned ones.

I cannot imagine that any scientist in this country will not show interest in this book, which addresses so many important issues related to science. Let me emphasize again that this trilogy should be made available to all the interested readers. Questions posed by the author, such as »Is there an end to science?« make this book on science assume the characteristics of a book on the philosophy of science, since the power of philosophy lies precisely in asking the »right« questions. I believe the book will make a strong impact upon the development of science in Croatia.

The trilogy was written by an erudite, who had obviously carried it in himself for a large number of years before he eventually decided to collect his thoughts on the development of mankind in four comprehensive volumes. I strongly recommend reading the trilogy. Read it attentively, slowly and enjoy it. This trilogy is not for fast reading.

Nenad Trinajstić