

# PENTTI MALASKA

## A Visionary and Forerunner

Edited by Laura Pouru • Markku Wilenius • Karin Holstius • Sirkka Heinonen





Tulevaisuuden tutkimuksen seura ry.  
Sällskapet for framtidsstudier  
Finnish Society for Futures Studies

# Pentti Malaska

## A Visionary and Forerunner

Edited by  
Laura Pouri  
Markku Wilenius  
Karin Holstius  
Sirikka Heinonen

Futures Series 9

© Editors, writers and the Finnish Society for Futures Studies

ISBN 978-951-98852-7-8 (print)

ISBN 978-951-98852-8-5 (pdf)

ISSN 1235-0028

Publisher: The Finnish Society for Futures Studies

Layout and illustrations: Anne Arvonen

This book was originally published in Finnish in 2017:

Pouru, Laura - Wilenius, Markku - Holstius, Karin & Heinonen, Sirkka (toim.) (2017) Pentti Malaska - Ennalta näkijä, edellä kulkija. Tulevaisuuden tutkimuksen seura. Tulevaisuussarja 8. 296 s.

ISBN 978-951-98852-4-7 (sid.), ISBN 978-951-98852-5-4 (pdf), ISSN 1235-0028.

Translation: David Kivinen, Käännöstoimisto Transmasters Ky

Photos and unpublished texts of Pentti Malaska: Family archives of Karin Holstius and Pentti Malaska unless stated otherwise

Printed in Turku by Painosalama Ltd.

2018

*A MESSAGE TO HUMANKIND*

*The mission of a human being is to prove  
that human life is a valuable part of life in general,  
that life  
is richer and more precious with humans than without.*

– Pentti Malaska

*TIME AND REALITY*

*Time flows  
to the Present  
from two directions:  
from the Past  
and from the Future*

*From the Past  
as our deeds accomplished,  
results materialized, and  
from the Future  
as our aims and visions,  
ideas of hope  
or despair,  
objectives targeted and committed to.*

*At the Present  
the streams of Time  
are mingled together and moulded  
into new realities*

*Like by a cosmic black hole  
the flows are caught, and  
the time can't escape  
from becoming real*

*Men and women,  
all the same everywhere!  
But their past and futures flow different  
create diverse realities of the Present  
– a precious gift of the Humanity –  
but why so strange to face, and  
so difficult to tolerate?*

– Pentti Malaska

# CONTENTS

TO THE READER.....	8
PROLOGUE: Formation and deterioration of the human-nature relationship.....	10
<b>PART I INTRODUCTION</b>	
1. An introduction to the thinking of Pentti Malaska.....	17
Markku Wilenius	
2. Recollections of Pentti Malaska's life and his growth into a thinker.....	31
Karin Holstius	
3. Futures consciousness and knowledge of the future.....	55
Pentti Malaska	
<b>Part II THE THREE CHALLENGES OF SUSTAINABLE DEVELOPMENT</b>	
4. Repairing humankind's relationship with nature.....	71
Laura Pouru	
5. Putting the common development of humankind first.....	89
Laura Pouru	
6. Human potential as driver of humankind's development.....	103
Laura Pouru	
<b>Part III PENTTI MALASKA'S RESEARCH AREAS AND RESEARCH METHODS</b>	
<b>7. PLANETARY MODELLING AND ENERGY RESEARCH</b>	
Planetary consciousness and planetary statistics.....	121
Karin Holstius	
Exergy and ASA analysis.....	127
Jyrki Luukkanen	
Energy tax comparisons and practices of energy and environmental policy.....	129
Jarmo Vehmas	

8. VISIONARY MANAGEMENT	
Pentti Malaska's contributions to developing systems thinking and strategic thinking.....	133
Jari Kaivo-oja	
Futures thinking and visionary management.....	137
Markku Wilenius & Laura Pouru	
Putting visionary management to practice at the Academy of Ilpo discussion group.....	149
Karin Holstius	
9. OTHER AREAS OF INTEREST FOR PENTTI MALASKA	
Futures research, operations research, statistics and mathematical modelling.....	153
Jari Kaivo-oja	
Pentti Malaska's Thesis Circle.....	158
Karin Holstius	
Pentti Malaska's Chinese connections.....	161
Karin Holstius	

#### Part IV FUTURES RESEARCH: ESTABLISHING THE FIELD AND CREATING NETWORKS

10. ACCOUNTS OF ENCOUNTERS WITH PENTTI MALASKA	
Pentti Malaska - a man always ahead of his time.....	169
Ilkka Virtanen	
Pentti Malaska's collaboration with philosophers.....	175
Ilkka Niiniluoto	
My encounters with Pentti Malaska.....	177
Olavi Borg	
Interaction and information technology.....	181
Marja-Liisa Viherä	
Spiritual growth as a counterbalance to economic growth.....	183
Reijo Wilenius	
Pushing the epistemological boundaries of futures studies.....	185
Ted Fuller	
Collaboration through the Club of Rome.....	187
Eleonora Barbieri Masini	
For the love of Pentti.....	189
Jim Dator	

11. Futures research as creator of meanings.....	191
Sirkka Heinonen	
<b>Part V COLLECTION OF POEMS WRITTEN BY PENTTI MALASKA.....</b>	<b>207</b>
REFERENCES.....	219
CONTRIBUTORS TO THIS VOLUME.....	237
PENTTI MALASKA'S CV.....	241



# TO THE READER

This book about the work and life of Pentti Malaska (1934–2012) began its own life many years ago when I, together with colleague Sirkka Heinonen and Pentti's wife Karin Holstius, started to contemplate the idea of compiling a commemorative volume that would trace Pentti's diverse thinking and activities. The idea gradually matured and we began to assemble the materials we needed for our project at the Finland Futures Research Centre. This was soon completed thanks to the efforts of Karin Holstius and the assistance of my colleague Juho Ruotsalainen. The next stage was for my colleague Laura Pouru to systematically review these materials and to begin to give a shape to the volume. And now, largely by virtue of Laura's dedication and hard work, we've reached the point where we have the book in our hands. Its four editors are Laura Pouru, Karin Holstius, Sirkka Heinonen and the undersigned.

This book is not a straightforward biography, nor does it provide an exhaustive account of Pentti's written production. Pentti was a true 'Danube of thoughts' who had an incredibly diverse range of interests, and it was therefore imperative for us to restrict our focus. To use another figure of speech, Pentti was a renaissance prince of our age, which in fact is not too far-fetched a comparison. That is, a recent description by Latinist Pekka Matilainen tells us that the birth of renaissance was effectively a symbiosis of early humanism and the evolution of modern scientific thinking.<sup>1</sup> If anything best describes Pentti's ambitions and activities, it is a combination of relentless faith in the potential of humans, on the one hand, and systematic and empirical scientific thinking, on the other.

We have organized the book into five sections. Part I of the book provides an introduction to Pentti's thinking and life, and we have also included one of Pentti's articles as an authentic illustration of his voice and thinking. We want to provide an insight into Pentti as a person and futures researcher. Part II is built around the countless newspaper and magazine articles and interviews published of Pentti over the decades. It is divided into three chapters that reflect Pentti's views on the conditions for sustainable development in our society. The question about the broken human-nature relationship, the nature of social development and the application of human potential were the main perspectives from which Pentti sought to unravel and understand the future of our societies. Part II includes many excerpts from Pentti's production, which are set out in italics.

---

<sup>1</sup> Matilainen, P. (2016) *Muutoksen tekijät. Renessanssin synty ja perintö.* [Change makers. The birth and heritage of the Renaissance.] Ateena, Jyväskylä.

In Part III we explore in more detail the methods that Pentti used in his research. Pentti was by training an electrical engineer for whom the crunching of numbers and construction of equations was a natural way to study relationships between different processes and phenomena. Pentti was a builder of systems-level models who genuinely knew what he was talking about. In addition, Part III sheds light on Pentti's views about management and strategic competence – an area he called visionary management. Pentti's role and contributions to the supervision of academic theses and his pioneering contacts with China are also covered.

In Part IV, a large number of colleagues describe their encounters with Pentti. Inevitably, these accounts only scratch the surface, yet they provide an intriguing insight into the breadth of Pentti's networks. Pentti also loved to express himself through aphorisms and poems, some of which are dotted across the book's pages, but Part V additionally brings all of these together. Pentti's CV is attached as an annex for readers who are interested. Kimmo Ojaniemi's series of artworks inspired by Pentti's theory of the ecosystem-technosystem relationship provides a separation between the different parts of the book.

I should like to thank all the contributors to this work for investing their valuable time. A special word of thanks goes to the Turku School of Economics Support Foundation for their generous funding for this project and to Dr Sakari Alhopuro for his financial support for the translation and publication of this English version of the book. Thanks also to David Kivinen for his translation and to our colleague Anne Arvonen for the visual design and layout of the book. Finally, our thanks are due to the Finnish Society for Futures Studies for accepting this book for publication in the society's series.

This volume is first and foremost a tribute to the memory of Pentti Malaska, a futures researcher, humanist and great friend of nature. We sincerely hope that it will contribute to further the themes that Pentti addressed during his career and that continue to have extraordinary currency today. The best ideas and insights never die, but continue to live on and gain momentum for as long as humankind has a future to look forward to. I'm convinced that many of Pentti's ideas fall into this rare category.

*Markku Wilenius*

31 January 2018, Helsinki

# PROLOGUE: FORMATION AND DETERIORATION OF THE HUMAN-NATURE RELATIONSHIP

**Pentti Malaska**

*This text is one of Pentti Malaska's last writings. It captures the essence of his thinking about the relationship between humans and nature.*

## **Humans in balance with nature**

The scientific understanding is that nature observes natural laws. Everything that happens in nature, everything that assumes an outward appearance and becomes observable, is a logically necessary causality of natural laws that is realized on the conditions of the natural state prevailing at each moment in time. Starting out from different natural states, i.e. under different boundary conditions, the same natural laws and causalities produce different kinds of events, without ever changing themselves. Natural laws are eternal and universal. Because of the laws of nature, the earth and its nature are changing endogenously all the time, as they have been doing for billions of years. Whatever humans do, they can never halt this unfolding sequence of natural states to any one state of their choice. Humans are part of the necessarily changing world and its nature. This is a fundamental premise for the determination of the place and relationship of the human species in nature, and in the early stages of the evolution of the human species this relationship was nature-based and did not differ from the relationship of other natural creatures with nature. At that time even 'humans' lived on nature's conditions and in balance with nature.

## **Humans in nature - consciousness as a sense of happening**

When in balance with nature and governed by the laws of nature, humans are a certain distinctive quality of each prevailing state of nature. When natural laws produced a constant succession of new events, some of them were manifested via the distinctive quality of humans and via changes in that quality, and became somewhat known to them. In the succession of events – through evolution – humans achieved consciousness, which is the same as this sense of happening. They were not just part of events, they were capable of recognizing that something is and that something is happening and that within this happening, there is a unity

with the other. The greater the resolving power of consciousness – the keener the sense of happening – the more complex and finely tuned central nervous system was needed in order for it to become manifested. Consciousness manifested in a sense of happening was not an indication of any damage caused to the human-nature relationship. The threat of damage required a higher consciousness.

## **Humans with their technology**

The sense of happening, as described above, did not involve awareness of the free will of a sentient being, about oneself or their distinctive ability to make moral judgements and assume personal responsibility for the consequences of happenings. Everything still happened in nature on nature's own terms, regardless of what the sense of happening as consciousness otherwise was like.

The relationship between humans and nature began to change, diverge from the rest of nature almost three million years ago. It was at this point that the human species called *Australopithecus garhi* learned how to make tools out of flint and to develop and use this technology. Over hundreds of thousands of years these skills were passed on from one primate species to the next, and the technology continued to advance and improve (measured in terms of the length of cutting edge per weight of flint). Based on evidence from the findings, the advances in technological development and the benefits they brought to the species were closely associated with the evolution of the size of the hominid brain and thus even with the mental essence of becoming human and culture. Technological development has played a decisive role in how the place of humans has been determined in the system of nature in the course of evolution. It has exerted significant selection pressure on human evolution, at the same time as its outcomes have further enhanced the development of technology etc. Once the biological evolution of the brain shifted from quantitative growth (some 150,000 years ago) to qualitative growth (increasingly complex and flexible central nervous system networking), technological development has assumed biology's former place in the evolution of the human species. For millions of years, then, technology has been irreversibly intertwined with the qualities of the human species, with the 'battle' against rivals in nature, with understanding the purpose of existence via technology and the way of life typical of the species. Humans, as a species, are nothing without their technology. But is the human species something with its technology, from the standpoint of nature and the world and from the standpoint of the future? This question still remains open. It even seems that technology is just a constantly swelling future deficit, causing irrevocable damage to the nature relationship.

As these questions can already be justifiably asked based on empirical observations and experiences, it is apparent that humans already represent a threat to their own balanced relationship with nature and that human emotional consciousness of happening is no longer adequate to understanding the planetary situation or to defining the place of humans within that situation. Humans' relationship with nature is being damaged in pace with technological development, there is an observable causality.

The distinctive quality of higher level consciousness, which led to the development of technology and which does not exist anywhere else in nature, found expression and evolved further in the process of becoming human. A new factor of change appeared alongside happening in nature: doing, intending and intentional activity. Since then, not all has been just natural happening – endogenous necessities of natural laws taking place under the boundary conditions given by nature – but it has been interspersed with intentional human activity and the consequences and effects of that activity. However, the events brought about by humans' intentional actions are subject to the same laws of nature as natural events. The new distinctive quality of humans is not manifested in new natural laws that humans could apply but nature couldn't, instead it is manifested in their ability to impose their own boundary conditions on laws of nature and thus to produce various consequences they wanted to achieve. At the same time, however, humans also produce other intended or unintended effects upon the prevailing state of nature. When humans pursue their purposes intentionally, nature changes in a way that differs from the natural course of events, sometimes in ways that even humans could not have predicted. Humans have a tendency to take even catastrophic risks if this might further their selfish interests.

## **Future deficit, higher consciousness, moral and ethics**

There is need for an awakening of self-consciousness and free will and an internalization of moral responsibility as a basis for action. Neither neuroscientists nor any other scientists have been able to identify any obstacles to the development of consciousness from the emotional level of happening to a higher level, quite the contrary. The development of consciousness started as a parallel phenomenon to evolution (happening), a slow intentional learning process of trials and coincidences, successes and errors, which coincided with the development of technology millions of years ago. A higher level of consciousness and corresponding moral and ethical laws of nature have been manifested in human activities more slowly and with less force than the development of technology. Here's a challenge for restoring balance in the future deficit.

Although humans have become a disturbance factor in natural events, this does not yet mean that their nature relationship has been damaged. Nature has the capacity to adapt to changes or to restore the changes caused by humans and to continue its endogenous happening. If the actions of humans were to end and nature were to remain on its own, the state of nature would be restored in a sequence of natural events. Humans could co-exist with the rest of nature by keeping their own effects within the bounds of nature's tolerance so that there would be no permanent damage to the nature relationship.

However, if the changes brought about by humans in the state of nature – in the boundary conditions of happening – are large enough, then nature will not be able to return to the previous state of happening, nature does not have sufficient resilience to repair the effects of human actions. Happening in nature is increasingly conditioned by human actions, and humans accordingly must adapt their own actions and objectives to the circumstances they themselves have changed. The effects of human actions on the state of nature become cumulative. In this situation it is a logical necessity that sooner or later, it will be necessary to face the event of exceeding threshold values. This situation represents a serious threat to the human–nature relationship. This corresponds to the current situation here and now.

When the threshold values are exceeded, nature cannot respond by restorative events within the limits of its tolerance, but there will be an irrevocable qualitative change in the state of nature, a bifurcation into a separate space where nature loses its previous capacity to function and is structurally impoverished. By now the relationship of humans to nature will be so severely damaged that it may have fateful consequences for the existence of the human species on earth.

Consciousness that only consists in a sense of happening is not enough to appreciate the severity of the situation or to plan and implement intentional, focused acts. A higher level consciousness is the distinctive quality only possessed by humans that is necessary for the continued existence of the human species and for the creation of a balanced relationship between humans and nature.



PART I

INTRODUCTION





# 1. AN INTRODUCTION TO THE THINKING OF PENTTI MALASKA

*Markku Wilenius*

## **Awakening**

Pentti Malaska was a futures research pioneer, an inspirational teacher and a profound social thinker. He raised the alarm about environmental problems long before they entered public consciousness. He realized the potential of new communications technology when it was still very much in its infancy. He spoke about immaterial values at a time when the word was really only used in the context of material and economic values. Malaska was a trailblazer in the true sense of the word.

Pentti Malaska had exceptionally diverse gifts and interests. He was by training an engineer, and after a spell with the energy company Imatran Voima he completed his doctorate in the mid-1960s in the field of energy economy. There was a strong streak of inventor in Pentti, and his solid foundation in engineering meant he was well-equipped to understand the critical dimensions of technological progress.

But Pentti was as no ordinary engineer. From the outset he showed an equal interest in economics, social sciences, natural sciences and the humanities. Driven by a boundless thirst for knowledge, he steeped himself in all these disciplines, arriving ultimately at a holistic approach that combined different scientific and other disciplines in an almost renaissance spirit. This was to become the hard core of his futures thinking.

Pentti's gift for mathematics led him to become Professor of Business Mathematics and Statistics at the Turku School of Economics in 1966. It was here that he trained several generations of students in rigorous logical thinking. The school was also to become the home for an academic research centre in the field of futures studies, which Pentti founded together with Mika Mannermaa in 1992. Pentti was also the first Chairman of the Finnish Society for Futures Studies, which was founded in 1980.

International exchange and collaboration were hugely important to Pentti. He joined the Club of Rome in the early 1970s. This was where he found his true kindred spirits: enlightened contemporaries from all over the world who were

concerned about the future of humankind and who knew it was urgent to recognize the profound impacts that economic and technological development was having on humans and the natural environment.

The founder of the Club of Rome, Aurelio Peccei was an Italian industrialist with a great capacity for systemic thinking. As early as the 1960s he had concluded that humankind's footprint on the globe had become so large and intrusive that something had to be done to take cultural evolution to its next stage: the conscious human being. It was this recognition that led to the idea of the Club of Rome, which in 1972 published its first, world-shaking report where the greatest minds from MIT introduced the first-ever dynamic model of the world. This model was to pave the way to a deeper, systemic understanding of humankind's intervention in the ecosphere.

At around this same time, in the late 1960s and early 1970s, Pentti published his first articles on the themes raised by the Club of Rome, addressing the essence of technology and other grand issues of our time. These ideas had been brewing in his mind for quite some while. He had been appointed Professor of Statistics and Mathematics at the Turku School of Economics in the 1960s, and under his leadership statistical mathematics transformed from a rather tedious and boring subject into an inspiring perspective on the development of humankind. With broad sweeps of his brush, he combined different subjects and disciplines and helped his students towards systemic thinking. His classes became extremely popular. His own insatiable thirst for knowledge kept driving him forward, towards a better understanding of how different trends in development were interconnected. Technology, nature, economy, culture and so on – in order to understand the bigger picture it was necessary to delve deep into the ocean of knowledge. In this search, every discipline and every field of knowledge provided material for research.

Pentti's thirst for knowledge stemmed from the question of society, social development, the question of how to steer collective consciousness towards understanding systemic disruptions. Everything else was secondary because Pentti thought humans are unique in their ability to create meanings. Here, he often referred to the thinking and writings of two Finnish philosophers, Georg Henrik von Wright and Reijo Wilenius, both of whom had firm views on the points of culmination in human development and human dignity, which were important values to Pentti.

By the 1980s, the contours of Pentti's social thinking were showing up with increasing clarity. There were two outstanding elements in his thinking: on the one hand his view on the evolution of social development, and on the other hand his view on social structure and its individual sectors that follow their own internal laws. Whilst in the former case the link with Tofflerian thinking is clear to be

seen, the source of inspiration in the latter is quite clearly Rudolf Steiner's social thinking.

Pentti's thinking cannot be reduced to any one person, however. His mind was at once a melting pot of all sorts of views and notions and a generator of new ideas: the most distinctive features of his social thinking are indeed his own original thoughts. The originality of Pentti Malaska lies in the way he combined different strands of thinking and different trends into new, broader conceptions and understanding.

## The development of human society

The following Figure (Fig. 1) provides a nutshell view of Pentti's thinking about the evolution of society:

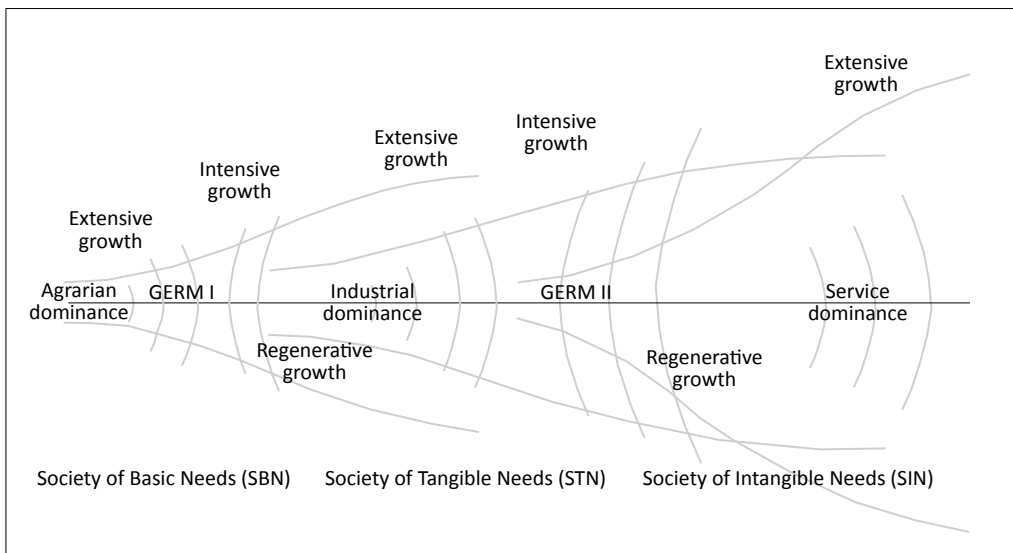


Figure 1. Model of social development according to Pentti Malaska.

The process of social evolution, in Pentti's vision, starts from the germ of agrarian society, which through intensive and extensive stages evolves into industrial society, which then evolves through similar stages into a service-dominated society. We are currently in the interim stage of this last transition, which Pentti used to describe as the information society. Information serves as the raw material for service society, just as fertilizers serve as the raw material for agrarian society, and mainly non-renewable materials serve as the raw material for industrial society.

At the core of this thinking of social development is Pentti's view of its underlying logic. There are three key aspects to this logic:

1. stage of development diffuses into the next;
2. the dynamics of development, where intensive and extensive stages alternate at the same time as regenerative growth drives development in a specific direction; and
3. the cyclical structure of development, where the recurring model provides the formal framework for development.

Let us consider these three aspects in more detail:

Pentti often stressed that the shift from agrarian to industrial society did not imply the disappearance of agriculture, but instead the industrialization of agriculture. It's easy for us now to see how this has happened. As in other countries, the average size of farms and the minimum viable size of farms have continued to grow in Finland. The analogy to business and industry where it is difficult to maintain profitability without growth is not at all far-fetched. Of course, the importance of agriculture to GDP and employment has declined dramatically during the growth of industrial society. At the same time, it is probably fair to say that information and technology have gained an increasing role there, as indeed they have in society and the economy more generally.

This paves the way to understanding the next stage that is now upon us: the advanced stage of industrial society contains the seeds for Pentti's vision of a service society. Just as agrarian society was profoundly transformed by industrialization, which brought a dramatic increase in labour productivity, so service society, as described in Malaska's model, is the next compulsory stage of development, because it dramatically increases the value of traditional industrial production. Ultimately, then, this unfolding process is about value generation.

The arrival of the service society does not then mean the disappearance of manufacturing and other industrial production. Rather, it means that production begins increasingly to resemble services. This is already evident in many advanced production companies today, where services account for an increasing share of their core business. A case in point is the most successful Finnish industrial company of our time, Kone Oy, where services currently account for half of the group's turnover.

Whereas the transformation of agrarian society into industrial society meant that agriculture was industrialized by fertilizers, the transformation of industrial society into service society will need to be powered by data and information. Consider

today's most successful businesses, such as Google, Facebook, gaming companies, and other firms expanding into traditional fields, such as Airbnb. All of these companies are in the business of developing and concerting data into digital format, which means tailoring, advanced service concepts and networked modes of operation. All of this comes under what Pentti described as 'service society'.

This saturation tendency in industrial society is driving the growth of a new kind of society. We are currently in the early intensive stage of a new social system, whose first fruits are just beginning to ripen. Intensiveness, in Pentti Malaska's model, means intensive dynamics and rapid changes – which is exactly what we are witnessing at the moment.

The intensive stage is followed by an extensive period. During this period, innovation slows down, although at the same time technologies and social practices are slowly but surely continuing to evolve. Our industrial society, in its current stage of saturation, looks very different from the industrial society that initially evolved to drive a new era of development. And now that we are heading towards a new kind of service society, it is again fair to say that what we now understand as a service is very different from what we will be seeing towards the end of this period.

The shift to service production is a transformation that will profoundly impact the development of society and the economy in particular. Industry will of course survive and continue – we will still need concrete, physical objects – but it will become tied in with ever more elaborate and advanced service concepts. Services do not need to be something that can be physically measured: often the most significant component of a service is the experience gained by the consumer.

Let me give a personal example: During the past year my research has taken me to California for several longer spells. While I'm there, I rarely use hotel services any more. Instead, I buy my accommodation from a company called Airbnb, which provides a platform for (mostly) private individuals to rent rooms. This means that instead of an impersonal hotel room, I get to stay in someone's home. The local provider makes the accommodation available, AirBnb gets its commission and I get not just a comfortable room, but also a sense of what it is like to live like locals do. In most cases I also get to know the local people.

The key again lies in the new communications channels provided by the broker and the huge 'Big Data' databank that makes the exchange of information possible and that stores all communication through the system on a customer interface. This makes for simple and fast communication and transfer of money. People who are looking for a service have access to vast amounts of information and other users' experiences that they can consult to support their own decision-making.

In this process the customer becomes an entrepreneur who moves around the marketplace much more independently, rather than just passively booking a hotel room. The service has absolute dominance in the commodity, and the service itself is highly varied and diverse, comprising both products, experiences and information.

As in earlier points of rupture and transition in society, technology again has the role of facilitating new social practices and models. As far as I am aware Pentti Malaska never elaborated to completion his idea of the future service society. I was convinced in the countless discussions I had with him – Pentti was above all a Socratic type of person who thrived on social interaction – that his ideas about the growing significance of services in society were grounded in his all-inclusive notion of humans and his perspective on human and social development that was dictated by this premise.

Everything for Pentti stemmed from needs, which had a pivotal role in his framework of social development. The most important function of agrarian society was to secure people's basic needs: to make sure they had a roof over their head and food on the table. Most occupations were related to farming, and life was very local. In industrial society, with the ever more specialized division of labour, needs became increasingly diversified. From self-sufficiency, the next step was to have exchange in the marketplace. People's needs were still predominantly material in nature, there were just far more of them with the continuing advances in technological development, increasing wealth and the consequent growth of the middle classes.

In Malaska's model, people's needs in the emerging service society are increasingly immaterial in nature. This is consistent with Maslow's hierarchy of needs, which says that needs at each higher level have more and more to do with self-appreciation, self-realization and interaction. The World Value Survey, in which sociologist Ronald Inglehart and colleagues have been monitoring the development of values around the world for several decades, likewise suggests a post-materialist trend in values.<sup>2</sup>

For Pentti, the question of the development of needs ultimately implied a kind of revolution of consciousness. Rather than in blind market forces, Pentti believed in people's internal development. That development was supported by the refinement and dissipation of knowledge in ever new ways. On the other hand, he also saw many external threats. One particularly noteworthy threat was the degeneration of market economy into capitalism. He regarded this as a problem whereby the broader interests of society are reduced to a battlefield of private capital. In

---

<sup>2</sup> World Values Survey, [www.worldvaluessurvey.org](http://www.worldvaluessurvey.org), accessed 18.1.2016.

this context he often used the example of the former socialist countries, which seemed to have become more capitalistic rather than market economies following the rules of democracy. But there were plenty of examples closer to home as well: local signs of the power of capitalism were provided by various technobubbles, for example.

In any event the revolution of consciousness leads directly to the phenomenal growth of interaction needs. And it is of course this that has powered the global growth and diffusion of digital technology, for which there has been strong human and therefore social demand.

### **Global thinking and threefold model of society**

Over the decades Pentti continued to work to expand his international horizons. In 1994, he became President of the World Futures Studies Federation. It is no exaggeration to say that in his day, Pentti was one of the most internationally connected persons in Finland whose network extended to every corner of the globe. His involvement in the Club of Rome also intensified from the 1980s onwards.

In the late 1980s Pentti contributed to an ambitious Club of Rome project aimed at establishing a future vision for African development. Throughout the 1980s, Africa had carried a predominantly negative image: the message that came across was one of extreme poverty and constant famines. This project was to become a major tour de force for the Club of Rome, but also for Pentti personally. He had already started work on his threefold model of society earlier in the 1980s (Fig. 2), and now he realized that the traditional model of African society provided just the right basis for his classification.



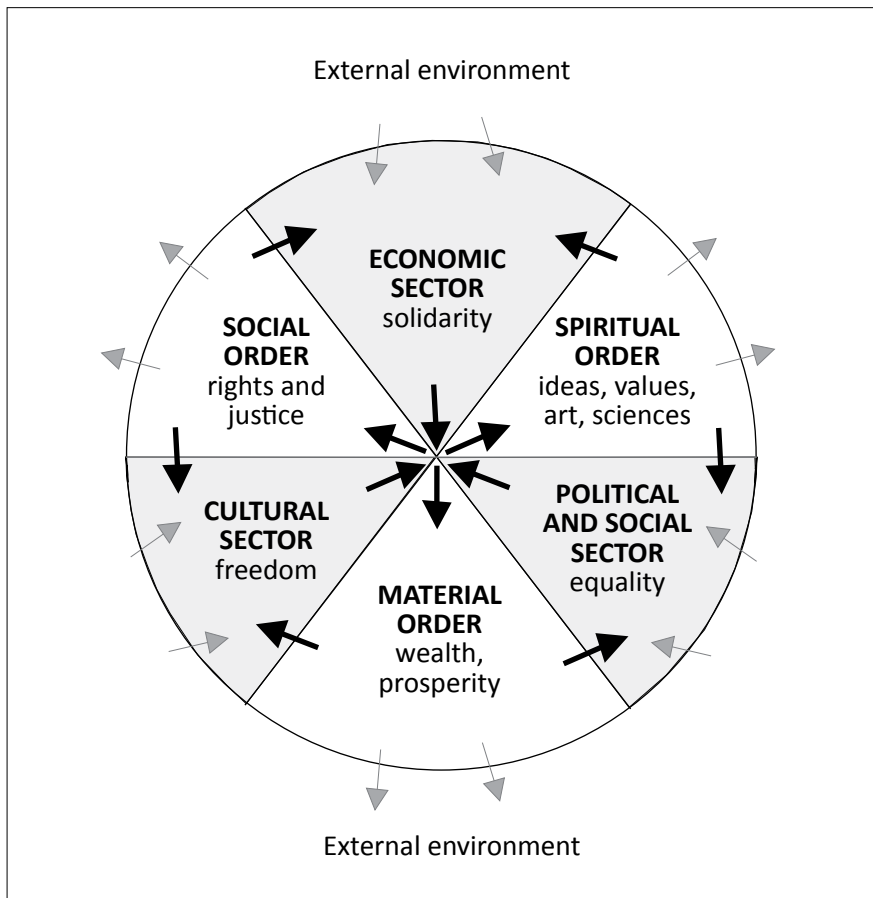


Figure 2. Sectoral model of social dynamics: three sectors create order in society.<sup>3</sup>

Malaska's model divides society into three semi-autonomous sectors, each of which follows its own set of principles. There is the cultural sector, which draws on the principle of freedom and which produces ideas, values, art and science for society; the political and social sector, which is based on the principle of equality and whose role is to maintain the rule of law; and the economic sector, which is based on the principle of solidarity and whose role it is to establish the material framework for society and to create prosperity.

If this scheme is compared to the current model of welfare society, it is immediately clear that the practices and principles in the socio-political and cultural sectors are closely aligned with present-day thinking, whereas the principle of solidarity in the economic sector sounds very alien indeed in today's world. On this point, Pentti often observed that it was for this very reason that the biggest problems

<sup>3</sup> Lemma, A. – Malaska, P. (1989) *Africa Beyond Famine – A Report to the Club of Rome*. Tycooly Publishing, London.

of our time have to do with the economy. That is, the overarching economic principle of today is competition rather than solidarity. Having said that, more and more companies are now emerging that have strong records of alliance and partnership.

Pentti was convinced that the overly prominent role of the economy in society will eventually recede, provided that this development leads in a favourable direction. In a service society the role of learning, creativity, science and art is more pronounced, given the growing recognition of their role in driving the economy. Again, this trend has now become more and more evident.

This threefold model of society, for me, has many important benefits. It provides a powerful tool for constructively analysing the flaws and imperfections in society, and makes it easier to understand what, in Pentti's view, was the biggest social challenge of all: that of sustainable development. The main focus of his intellectual passion was to try to understand how sustainable development could happen in our society, what it required. He identified three kinds of challenges to sustainable development. I briefly describe these challenges here and Laura Pouru elaborates them further in the part II of the book.

**The first challenge** is to repair our relationship with nature, to afford nature as a resource and an ecosystem that ultimately supports human activities the value it deserves. If our relationship with nature is wrong – which in modern society it is – then ultimately this will be rectified even without humans. However, in this case humans will no longer have any place in the ecosystem, but we will simply be ejected through various upheavals. Pentti's work in the Club of Rome can of course also be seen as an attempt to send out a wake-up call to humankind and get people to reflect upon their relationship with nature before it is too late. He thought this was largely a matter of understanding the role and significance of the economy. It was imperative to get rid of nature-destroying exploitative capitalism and to restore the role of the economy under the 'invisible hand', as defined by the 18th-century enlightenment and economic thinker Adam Smith. People needed to have the opportunity to pursue their own personal economic interests, but only within the universal framework dictated by the general interests of society. The work done in Pentti's various research teams showed that only around half of current economic growth was 'sustainable', while the other half was happening at the expense of the natural environment.

**The second challenge** is to put to the common development of humankind first. In this respect, Pentti maintained, there remained a yawning chasm between the ideal of sustainable development, international conventions and the agreements aimed at governing the global system, on the one hand, and the practices of real

economy, on the other; they rarely coincided beyond the rhetorical level. It is clear that we are still a long way away from the situation where concrete economic measures and the necessities of profit-making follow ethical principles grounded in sustainable development. This would require changes in taxation and other basic structures in society, as well as the full-scale mobilization of social capital as part of humankind's collective development. The work of the Club of Rome serves as an example of how this social capital is channelled to meet humankind's needs as it struggles to resolve the question of how and on what conditions human life can continue in the world through to the end of the millennium.

**The third challenge** follows directly from the second one and has to do with understanding human work and creativity as the primary engines of development. How can this valuable human capital be put to the best possible use? Pentti felt that the current transformation of work is particularly challenging, as well as being completely inevitable. The shift from a society based on industrial commodity production to the production of services – even though services do still involve some commodity production – is the outcome of a longer-term development and in practice means changes to the content of work and new needs, i.e. an expansion of the labour base.

The growth of services in industry is an integral part of a broader trend where work is changing with the ways in which it is organized. As services continue to gain a more prominent role in the value chain of industrial production, a new kind of organization of work is evolving: this is inevitable because services cannot be organized in the same way as the production of commodities. As a result, expanding service production is increasingly being outsourced. At the same time all future production, starting from agriculture and industry, increasingly consists of service production in a global networked economy and its local hubs.

Pentti believed that the transition that now lies ahead will be an even greater upheaval than that from agriculture to industrial production. This is because the organization of production, changes in the value chain and the distribution of labour will shake the industrial economy to its very core. With technology continuing to develop on a logarithmic scale, the changes are bound to be sudden and dramatic. The major shifts and changes we have seen in the past 20 years are just a foretaste of things to come. Even more than the fantastic opportunities opened up by digital technology, Pentti was interested in the question of how technology could become more 'natural', how future technology could better serve the needs of humankind in more flexible, sustainable and resource-efficient ways.

## Pentti Malaska as a person

Pentti Malaska was by nature a Socratic thinker who thrived on intellectual dialogue. We on his team used to playfully call him the ‘Danube of thoughts’ on account of his uncanny ability to always find fresh angles on any subject. For me personally and indeed for many others, meeting Pentti Malaska was an important turning point that opened a secret gate to new worlds.

Pentti was an easily-enthused and warm-hearted person, which was no doubt attributable to his Karelian roots. It was humanly extremely rewarding to work with him. His leadership principle became known as a classic: “If you’re not having fun here, you’re fired!” – an idea that would certainly deserve some thought and attention in modern-day leadership workshops.

When public debate about nuclear power or other hotly contested issues was raging high, Pentti would like to join in with his full complement of arguments. He would be particularly distressed and annoyed to see social and political decisions made on the basis of what he considered irrational arguments. In Pentti, the anti-nuclear lobby found a figurehead who was not afraid of putting himself in the firing line of industry bosses if and when that was necessary.

Pentti initially slipped into the role of an active public debater in the early 1970s, at the time that the Club of Rome’s Limits to Growth report was published. The basic tenets of this report – which by now are accepted throughout society – were pure poison to many economists who believed blindly in the virtues of economic growth. Pentti set an example for us younger colleagues: even when repeated blows rained on him, many of them below the belt, he showed it was the civic duty of an academic to demonstrate the true nature of things by means of robust, factual arguments.

In these debates and discussions Pentti was never content to be just a critic, but he always put forward his own alternative, whether it involved energy solutions, the measurement of welfare or explaining the world. In his last years he set out to develop his idea of ‘neo-growth’, a type of economic and social growth that would not be based on the exploitation of natural resources and the growth of social inequality. This was a project he never finished.<sup>4</sup>

---

<sup>4</sup> For more on neo-growth, see Chapters 4, 7 and 11.

## About the future

In what was to remain Pentti's last published article,<sup>5</sup> 'Futures consciousness and knowledge about the future', Pentti Malaska offered the following definition of futures research:

'Knowledge of the future refers to visionary knowledge of contingent, intentional, and non-factual phenomena. It does not contradict objective or other factual scientific information that is relevant for the research. For this very reason, the idea of knowledge is more general in nature in futures studies than in other academic fields. From the perspective of generalised scientific knowledge, futures research does, however, constitute a scientific area of knowledge.'

So what exactly is it possible to know about future society? It is unlikely we can say anything very specific with any degree of certainty. However, we do stand a better chance if we have access to methods that can help us understand possible futures as non-factual phenomena. Pentti tried to understand the development of future society from two specific perspectives: first, as recurring dynamic structures; and second, from the vantage point of different sectors and their distinctive characteristics that are inclined to materialize in each historical context.

These premises do not yet provide us with any real forecasting apparatus, but they do give some indication of the general direction in which we are headed. In my own recent studies I have been working to forecast possible future scenarios based on Kondratiev waves. This work is quite closely in line with what Pentti sought to do, i.e. open up a perspective on the future by drawing on historical data and the laws of social development, and by adding to the equation the growing resource pressures that follow from economic globalization, population growth and environmental pollution, which set the demand frame for the next wave.<sup>6</sup> Our thoughts and ideas did not differ very much from each other in these respects, either.

In Pentti's world everything is reduced to consciousness. In his words, we have now arrived at the 'watershed of the future', a point where the human capacity for reflection is true in the sense that we not only know, but we can also know that we know. This presents us with an unforeseen challenge: we understand that we are responsible for leading a sustainable and valuable existence as part of the broader fabric that is life, and that the totality of life of which humans are part is richer and more valuable than life without humans.

---

<sup>5</sup> See Chapter 3 in this volume.

<sup>6</sup> Wilenius, M. & Kurki, S. (2012) Surfing the Sixth Wave. Exploring the next 40 years of global change. FFRC eBook 10/2012.

This is the challenge that at once dictates the conditions for social development. Being conscious means accepting one's responsibility. In the context of social activity, this means, for instance, discontinuing activities that are destroying the biosphere. Pentti worked for decades on research – and I was involved in this work myself – that was aimed at presenting both a quantitative and qualitative analysis of how the dematerialization of the economy could be accelerated to the extent that the overall burden from human activity on the natural environment could be reduced. This would obviously require a shift in consumption in a less material direction, but it would also require a massive investment in new technology that is friendlier to the environment. None of this can happen without a collective consciousness of the conditions of human activity.

This brings us back to the power of systemic thinking. Pentti Malaska was above all a systemic thinker, yet he never shied away from the empirical details. On the contrary, he used the details to create a more nuanced and in-depth picture. Whether it was climate change, nuclear power, new information technology, chaos theory or cultural evolution, Pentti tackled all and many other areas with his inimitable energy to try and uncover the ultimate structure of reality. He harboured a scholarly interest in knowledge, but he also wanted to make a difference in society. Ever since the earliest days of the Club of Rome, perhaps even earlier, it was clear to him from his own research that humankind had indeed come to a crossroads. In that situation it is not enough just to do research. It is also necessary to do something to make a difference.

Pentti's social and social scientific thinking was thus ultimately related to the question of social change. In order to bring about that change, it was not enough just to announce one's pious wishes, but it also required research and concrete actions, social activism: taking positions and challenging prevailing ways of thinking, even at the risk of being ridiculed and criticized.

He saw his own role as a researcher and professor as that of a servant: he was there to serve the people who represented society. His job was to assess the soundness of social and economic decision-making from the point of view of society's interests as a whole. He shunned elitism in all its forms.

Pentti's futures thinking is neatly captured by the following aphorism of his:

*According to Voltaire the optimist believes that we live  
in the best possible world,  
and the pessimist fears that this is true*

*The optimist's faith  
and the pessimist's fear  
they must be called into question,  
otherwise we have already had our last chance*

Pentti had the capacity to delve into both the future and reality. What mattered most for him was consciousness, which is what made humans capable of considering the future.

Pentti Malaska was ultimately a classical humanist who believed in humankind's capacity for civilization.

## 2. RECOLLECTIONS OF PENTTI MALASKA'S LIFE AND HIS GROWTH INTO A THINKER

*Karin Holstius*

On 27 February 2009, Pentti received an award from the Finnish Cultural Foundation for his 'vision, foresight and trailblazing work'. It was a source of great delight for him. Pentti received frequent praise for what he had achieved during his lifetime. However my own sense is that the two most outstanding recognitions for Pentti himself were this award from the Finnish Cultural Foundation and the honorary doctorate he was granted by the University of Vaasa on 9 June 2006.

On both these occasions the emphasis was to highlight the broad range and diversity of his life's work. The summaries of the recognitions were accordingly rather long drawn-out affairs: 'a scholar with great national and international influence, a pioneer of futures studies, a scientist and great contributor to public discussion and debate, an engineer with a deep and diverse understanding of technology, an economist who has introduced new theoretical insights and innovations, a poetry-loving humanist who has brought current themes into the spotlight of both scientific and public debate, including the values and rationality of energy policy, nature-oriented technology, the philosophy of technology and visionary management' (Finnish Cultural Foundation) and 'one of the pioneers of Finnish operations research who has done extensive research in the fields of energy technology and economics and on the philosophy of science in modelling and on business intelligence applications. Malaska is without doubt the undisputed father of futures research in Finland' (University of Vaasa).

But of course Pentti's quiet joy and appreciation of the recognition he received for his work was also evident on other occasions, such as at the 10th anniversary of the Finland Futures Research Centre in 2002 and the various events surrounding the award of an honorary doctorate by Tallinn University in 2010. I was requested by the other editors of this volume to look back at Pentti's childhood and youth in search of any early signs that might have foretold his momentous life's work.

### **Pentti's childhood**

When I think of Pentti's lectures and writings about planetary statistics in the 2010s, my mind is drawn back – mainly through word association – to what he



wrote earlier about his experiences of evacuation during the war.<sup>7</sup> These accounts of his childhood in Käkisalmi in Finnish Karelia date back to a time when he was about three or four years old. He's talking about his trips on a horse-drawn sledge around Lake Ladoga with his father and mother:

'Sometimes we went visiting on a children's sledge, where you could sit or lie down under blankets. It was a long way across the frozen lake, in the dark, you could feel the cold air on your face and sense the crisp snow crackling under the runners of the sledge. There was a quiet mumble from behind, which made you feel good. Overhead, the deep and clear star-filled sky was far away and beautiful and enchanted the small traveller to sleep.'

Pentti's brother Martti remembers – based partly on their mother's stories – how amazingly content Pentti used to be even when he was left in a pen. He was never cranky and never wanted out, but was always happy and smiley. His brother, by contrast, always demanded to get out, straightaway. Even then, Pentti enjoyed being alone with his own thoughts and ideas. All the inspiration he needed was a piece of paper he could fold and tear up. Both mother and brother often spoke about how acquiescent and content Pentti was as a child.

The family's journey of evacuation took them all the way to the southwestern corner of Finland and via Ostrobothnia back to Lappeenranta. There, in autumn 1946, Pentti joined the second grade of Lappeenranta lyceum. His younger brother Martti has the following recollections of these days: Maths was life's most important thing for Pentti. As soon as they got their textbooks, Pentti would do all the exercises from beginning to end together with older brother Juha; it was like a game or competition for them. There was never any hesitation in the family that it would be Pentti who'd have his own room, while his two brothers shared. He spent a lot of time in his room. He wasn't really interested in sports in any form, neither then nor later in his life. I remember him often saying that just thinking about physical exercise was enough to activate the body – but I don't think he even thought about physical exercise very often. If his brothers had any maths questions for Pentti, he would always be happy to see them in his room, although he did apparently have some difficulty understanding why they had such trouble even though the exercises were so easy.

The mid-1940s saw an important event that would have a major impact on Pent-

---

<sup>7</sup> Malaska, P. (2006) Yhä uusiin vieraisiin paikkoihin piti sopeutua. [Always adapting to new places.] In: Kuorsalo, A. – Saloranta, I. (toim.) Evakkotie. [The road to evacuation.] Ajatuskirjat, Helsinki.

ti's life. In an interview with the Finnish Cultural Foundation<sup>8</sup> Pentti describes how when he was 13, he was given a book by his uncle on the history of electricity. Having read the book, he decided he wanted to become an electrical engineer. Fast forward a couple of decades and in 1965, he earned his doctorate in electrical engineering from Helsinki University of Technology, based on his work to develop a mathematical model for forecasting electrical energy consumption. This book clearly marked out Pentti's future career as a futures researcher and an energy expert – although the book itself has apparently been lost in a succession of removals in Lappeenranta because I have never seen it myself. Pentti never told me anything detailed about its content, but then most of it would have been in figures and graphs any way!

Pentti's Karelian roots were clearly important to him. Friends and colleagues also took note of this; as Markku Wilenius, of one of his closest colleagues, described in the previous chapter 'Pentti was an easily-enthused and warm-hearted person, which was no doubt attributable to his Karelian roots'. We once read a book which prompted us to get to know ourselves better by trying to find our primary identity. Pentti answered straightaway, without a moment's hesitation, that he is Karelian. He always had a warm and close relationship with Lappeenranta, which was to become a safe haven for Karelian evacuees and where his father and mother and both his brothers and their families lived. Lappeenranta lyceum likewise also remained important for him. Sometimes he would stop his car outside the school building and we would just sit there watching.

Pentti loved to look back at his time at school and his Russian studies under the tuition of Finland's most famous and most demanding teacher 'Ana' Wolkoff. He often talked about her and her enthusiasm for teaching. One of the stories told about lecturer Ana Wolkoff was that applicants to study the Russian language at the University of Helsinki were immediately told by the examiner that no entrance exams were required if they had been students of Ana. The effort he put into studying Russian at the university and Ana's requirement that all her students achieve the highest degree in the matriculation examination stood him in good stead later in the 1970s and 1980s during his many trips to the Soviet Union, in his capacity as member of the Finnish-Soviet committee on scientific and technical cooperation. Later on he had contact with various Russian scholars among others through his role in the WFSE, as recipient of the Russian Academy of Sciences' Kondratiev Medal and as an honorary member of the Russian Futures Research Academy. In the 2000s, Pentti and I attended various Russian language courses and discussion groups together.

---

<sup>8</sup> Tammenlastuja (1/2009) Pentti Malaska – Ennalta näkijä, edellä kulkija. [Pentti Malaska – A visionary and forerunner.]

## The forest - a place for quiet contemplation

Pentti enjoyed his lonely walks in the forest, from the time he was a schoolboy all the way until his last summer of 2011, at our new island retreat in Barösund. I have to say that I did not always feel entirely comfortable when he would suddenly disappear, in the middle of our walk, into rugged and bouldery terrain, when he was no longer his fittest self. Yet I knew the forest had always been important to him, which became clear to me during our summers on the island of Mälinsaari in Luumäki in 1986–2010. Every time we went there in the spring, Pentti would do a tour of the island to check out the trees and the plants and the bird's nests. Often we would explore and try to locate the ethereal essence of trees together with Tapio Kaitaharju, Raimo Antikainen, Esko Jalkanen and other forest-minded friends. Pentti had a great close relationship with the forest, and I'm sure he had a powerful sense that this was a place for restoring one's energy and vigour.

The following is just one excerpt from Pentti's recollections of his summers at Mälinsaari:<sup>9</sup>

‘This summer's new life entries include five goldeneye chicks from the nest box, two black-throated loon chicks from the nest on the shore, and two gulls from the reef, countless blue tit and pied flycatcher tits from nest boxes and five spotted flycatchers from under the eaves... In June, the forest was a hive of activity, with the birds happily chirping away and all manner of bird calls and expressions of the joy of life, almost around the clock. The forest was singing and ringing and all joy was erupting. And then suddenly the cacophony of sound died down, and the forest fell silent. You can experience this each and every year, and there is something sacred about the sense of joy and elation. Once the chicks have flown from the nest, the forest goes silent as if by magic, and there are no more mothers flying back and forth to the nest on food runs. Just the occasional blue tit tweeting every now and then... A proud loon family will still be circling on the lake, as always, their eerie calls echoing across the wilderness. In the evening and late at night, it's a sempiternal sound you cannot help but stop and admire...

How could experiencing nature be incorporated into measures of GDP growth and welfare? The official version, of course, is that happiness in life is a function of economic growth and measured based on the rate of economic growth. There is no way that the joy of life in nature or the calls of the loon on the lake can be entered into euro-denominated balance sheets. We'd need to have different kinds of balance sheets: balance sheets of respect, enchantment, sanctity, if only they

---

<sup>9</sup> Paakkola, E. – Turunen, K. & Kaitaharju, T. (2003) Toisin tietäminen. Tapio Kaitaharju 80 v. [Knowing differently. Tapio Kaitaharju 80 years.] Arator Oy, Helsinki.

existed. That's how they could be counted among the factors that decision-makers deem relevant. But they don't exist. And that is why experiences of divinity, respect and sanctity are drifting ever further from everyday accounts of euro-dominated growth and quietly becoming experiences that are ever harder to reach. Ultimately the experience of sanctity and respect can disappear altogether from the human mind, and all that remains to be sanctified is the growth that has been achieved...'

Pentti had also attached a poem to the text:

*LIKE A BREEZE OF WIND*

*Like a breeze of wind  
in a misty cloud*

*Are our experiences and thoughts  
in the world  
as they create reality.*

Pentti was a thinker and philosophizer ever since he was a child. His brother Martti says he enjoyed his own company, to the point of being a recluse, yet at the same time he was very sociable. I myself like to think back at the times that Pentti spent alone in his study in Oulunkylä, deep in contemplation either at his computer or in his armchair, and I got into the habit of asking whether I was disturbing him when I entered the room. I would always wait until he had finished his thought – and then he would turn to me and ask happily: 'Yes, you had something to say.' We used to laugh at this habit we had developed, and a couple of times Pentti made sure I did not think he was annoyed or angry for some reason: 'This is just who I am.' One of Pentti's endearing characteristics was that he'd always go along with the other person's wishes or plans. I think he had inherited this from his mother, who often said, in a Karelian dialect: 'Oh this is fine by me, couldn't be happier.' But this personality trait also meant you had to be careful: when you were planning a trip, for instance, it was important to make several suggestions so that Pentti wouldn't just say yes this is fine by me, couldn't be happier to whatever he heard first.

## **Equations and symbols**

Pentti was always working on some equation or other. And wherever we were, he'd be asking me for a pen and paper. Sometimes I'd try to ask what exactly it was he

was trying to solve, but only once did I get an answer: apparently there was some equation of Einstein's that had room for improvement. I realized straightaway he was far too modest to explain what he was doing, and any additional questions of mine were met with a kind smile.

Symbols were important to Pentti. Around the turn of the century he bought for himself a Finnish copy of Carl Jung's *Man and His Symbols*,<sup>10</sup> a richly and beautifully illustrated book that Pentti enjoyed reading and viewing. The book's main focus is on how symbols tie in with the subconscious, on ancient myths and the modern man, the individuation process and symbolics in the fine arts. At this juncture it is interesting to note that in 2000, we had a visit at our home from Kiinteistölehti, the trade journal of the Finnish real estate field, who wanted to interview Pentti. The story they eventually published (which dealt with the role of civic movements in resisting the power of the business state) featured a colour photo of the famous painting by Finnish symbolist Hugo Simberg called *The Garden of Death*. The interview revolved heavily around symbols, and the journalist noted that we had on our wall a drypoint etching by Simberg called *Poor Devil and the Twins*. Pentti also talked about the FUTU project<sup>11</sup> and said that the search for information about sustainable development and information society involved assuming the role of *Homo Ludens*, playing man.

At the turn of the century Pentti was also reading a book called *Death of the Philosopher*.<sup>12</sup> I've now read this book myself, and among the 40 philosophers featured my attention was drawn first and foremost to an article on 'Science and the signs of immortality. Charles S. Peirce (1839–1914)'. For Peirce, the article observed, humans are essentially users of signs, to the point that he sometimes describes humans as symbols. He has also said that humans achieve consciousness by means of signs and that humans create symbols at the same time as symbols create humans. Peirce also had the notion of the immortality of community. He observed that social immortality was primarily about the immortality of symbols and that humans assemble around themselves a kind of network of signs that tie in with different practices. This whole, according to Peirce, is the human personality, which can spread via community and lead to a strong personality living almost eternally via signs. I have been involved in the annual seminars arranged by the Finnish Society for Futures Studies in Pentti's memory and I soon began to feel that Pentti had indeed assembled around himself a network of signs and related practices as well as a large number of futures researchers, many of whom are fol-

---

<sup>10</sup> Jung, C. G. (1964) *SYMBOLIT – Piilotajunnan kieli*. [Man and his Symbols.] Otava, Helsinki.

<sup>11</sup> More on the FUTU project in Chapter 11.

<sup>12</sup> Kaitaro, T. & Roinila, M. (2004) *Filosofin kuolema*. [Death of the philosopher.] Summa, Helsinki.

lowing the path laid out by Pentti in his research and teaching. So perhaps, based on Peirce, we might say that Pentti is in some way and form continuing his life in the domain of futures research.

Pentti also wrote poems for events hosted by the Finland Futures Research Centre and The Finnish Society for Futures Studies, which clearly show his excitement about futures research and his desire to share and spread this excitement and enthusiasm with everyone attending. The following lines are a poem that Pentti composed for and read at the Finnish Society for Futures Studies 30th anniversary celebration on 27 May 2010.

### *ODE TO THE FUTURE*

*The future is dancing in front of us  
its seductive dance of the seven veils  
– that never started and never ends –  
holding our mind in its spell.*

*Teasingly it strips off its veils  
– the joy and inspiration, hope and despair,  
work and faith and the happiness and horror of memories –  
and throws them upon us  
so that it never discloses itself.*

*Flirtingly it reveals a fleeting moment:  
this is how I could be, might be,  
and invites us to join it in its play that our mind cannot resist.*

At the Top Ten Futures VI seminar on 7 April 2008, Pentti gave a talk under the given heading of ‘The consumption of futures’. This is how he started his talk:

‘There may be someone here in the auditorium who understands the meaning of this title I’ve been given. Unfortunately that someone’s not me. So many times you wonder why on earth do I agree to do all of these things; surely I’ve done my bit by working with Ilkka Virtanen to write a rigorous theory of futures universes, which was published in the Society’s latest *Acta Futura Fennica* book under the title of ‘How Do We Explore Our Futures’. The good thing about the title is that there are no canonized models, and I’m sure the audience has no expectations beyond open-mouth anticipation. So there’s no danger of me wandering off-topic or addressing a subject that’s completely irrelevant. I will take every advantage of

these freedoms in my talk, as you will no doubt realize to your shock and horror...'

Pentti concluded his rather lengthy talk by reading his poem 'The Eye of Gaia is Upon Us', saying that he had tried in it to find in ourselves a cosmic fullness instead of quantum emptiness.

*THE EYE OF GAIA IS UPON US*

*The role of humans is not to ensure their own  
reductiveness.*

*That would have  
no essential meaning.*

*Neither is the role of humans  
to secure life because  
Life will look after itself,  
even without humans,  
as it has done for billions of years.*

*Life will always win  
no matter what humans do.  
It's just a matter of whether  
humans will win with life.*

*The role of humans is to show  
that it is possible to  
win with humans,  
that human life is a valuable part of life as a whole,  
that life with humans is richer and more valuable  
than without humans.*

*Making life valuable and  
experiencing it as such  
requires of humans a special quality,  
it requires an awakening to an ethical consciousness of the world.*

*The power of consciousness in the universe!  
Some it raised upright,  
others it raised up off the ground.  
But those who still remained on all fours,  
didn't like it.*

## Fractal geometry, visual arts and poetry

Apart from symbols, Pentti was also interested, among other things, in fractal geometry and art based on fractals. In summer 1993, the recently founded Finland Futures Research Centre, under Pentti's leadership, hosted in Turku a conference with the title 'Chaos and Coherence'. Among the conference participants was mathematician Benoit Mandelbrot, whose research interests included randomness, fractals and chaos and who in 1975 had published his own fractal theory. Pentti himself had collected fractal images from the early 1980s, and he was absolutely fascinated by them. I remember when we were first seeing each other – this was before we had our island retreat in Luumäki – we spent one weekend in Karjalohja. Pentti had brought along these colourful images, and he was so enthralled by them that he spent all weekend showing and explaining them to me.

I suppose it is fair to say that Pentti was also fascinated by other things that challenged the eye and visual perception, such as 3D images and optical illusions. One of the many books in his library was 'The Eye Beguiled – Optical Illusions'<sup>13</sup>, which features drawings by Oscar Reutersvärd, Dallenbach and M.C. Escher, among others. Pentti often liked to use these kinds of ambiguous figures and impossible objects in his own talks and lectures. In his home in Turku in the 1980s and 1990s, he had a framed drawing by M.C. Escher on the wall. One favourite image that Pentti often used in his talks was the optical illusion called An Old or a Young Woman, which dates back to the nineteenth century.<sup>14</sup> His point was to demonstrate how one and the same thing can be viewed in different ways – an important observation for a futures researcher.

Pentti was always extremely interested in the way that the human brain worked. In 1984 a reporter for the general interest magazine Seura thought this was such a central concern for Pentti that the title of the piece appearing in the magazine was 'Why do people not care about their own brains' – even though the interview itself dealt with the Club of Rome meeting in Helsinki. This is what Pentti said in the interview:

'We believe in electronic brains. Yet we have within our own head a brain that is one hundred million times more powerful, yet no one is interested in how we should use it. I'm more interested in the application of human mental capital than the development of information technology in and of itself.'

---

<sup>13</sup> Ernst, B. (1992) *Optical Illusions – The Eye Beguiled*. Benedikt/Verlag GmbH.

<sup>14</sup> *Visual Illusions* (2004) Tobar Ltd, UK.



A recent issue of the popular science magazine *Tiede*<sup>15</sup> features pictures that appear in the books mentioned above, in a colour supplement entitled 'Cheat your brain'. It observes that even though our visual system is incredibly sophisticated, it is nevertheless susceptible to mistakes: our brain is not always right and our observations are not always objective. Optical illusions help to explain how this all works, which is no doubt the reason why Pentti liked to examine these eye-challenging images and why he sometimes used them when he was talking about his ideas of futures research.

Today, an online search for optical illusions will produce countless examples. They have diversified enormously, and now put the viewer's eyesight to such a severe test that they come with warnings of the risk of epileptic seizures and with instructions of how to protect one's eyesight.

Pentti was also fascinated by an Otto Mäkilä oil on veneer painting from 1938 called *Poésie*, and a composition from 1950, both of which are hanging in the Turku Art Museum. Pentti associated with the former his *The Earth is Finite* poem, while the latter brought to his mind an excerpt from 1960s futurologists: 'Machines, are they to replace humans / no there are still lots of humans / who are replacing machines / many of which are still uninvented'. These images and thoughts were presented in an extensive interview with Pentti that was published on the eve of the 1993 *Chaos and Coherence* conference.<sup>16</sup>

---

<sup>15</sup> *Tiede* (4/2016) *Huijaa aivojasi*. [Cheat your brain.]

<sup>16</sup> IBM Katsaus (4/1992) Pentti Malaska – Two decades at the Club of Rome.

## *THE EARTH IS FINITE*

*It is not surprising that growth continues  
even though the earth is finite.*

*Most people, rich or poor,  
see expansion and growing more  
as the only  
imaginable solution to their real and  
immediate desires  
even though the earth is finite.*

*In the world of riches, growing more appears to be  
the way of life necessary for employment, status,  
paying back anticipated growth some day,  
and for development  
defined solely by things and matter  
even though the earth is finite.*

*In the world of poor, growing more seems the only way  
out of poverty and despair, and  
having children not only as a source of joy and love,  
but as a thing of trade  
even though the earth is finite.*

*Until other thoughts than growing more  
are found to remedy  
the problems encountered,  
the people will not give up their hopes and desires  
invested in the idea of growth  
even though the earth is finite.*

*But the earth is finite.*

In 1994, Pentti wrote a poem for me, perhaps by way of an assurance that even though his thoughts were always tuned to futures research and to saving the world, there was still room in his mind for me. He was just as deadpan in writing it and handing it over to me as in everything else he did. I was just turning around in his study when he said in passing, 'this is for you' and handed me this sheet of paper, printed in a beautiful typeface:

*TO KARIN*

*Day after day  
my life is being assembled  
in linear succession  
The earthly experiences,  
from birth to the end,  
leave no room for  
a sense of eternity*

*Your existence, my love,  
is different to me,  
not being part of  
the linear succession,  
but all encompassing  
Casting our experiences  
into timeless forms of  
eternal happiness and love.*

This was happening at around the time that the Work and Transition research project was being finalized; that Pentti was working with artist Kimmo Ojaniemi to set up the Gaia exhibition at the Wäinö Aaltonen museum in Turku; that Pentti was about to take over presidency of the WFSF; that planning for the major Nairobi conference the following year was in full swing; and that we both had our hands full launching the SIFE project. Pentti would no doubt have had other ongoing projects as well. In the very last months of his life he was still writing down notes on new futures research themes.

Pentti's collection of poems called *Open and Fuzzy Systems*,<sup>17</sup> as the name implies, is a more technological, scientific and analytical work than many of his later poems.

---

<sup>17</sup> Malaska, P. (1979) *Avoimet ja sumeat systeemit*. [Open and fuzzy systems.] Weilin+Göös, Helsinki.

*The technosystem needs not only  
natural resources, it needs them in a  
very specific quality,  
very specific form,  
very specific quantity,  
at a specific moment in time,  
at a specific place,  
at a specific price, and  
in a specific combination.*

*This need is satisfied through productive activity.  
In satisfying this technosystemic need humans  
break down the natural flow of matter, energy and information  
as well as related other opportunities to humans themselves  
and to other nature  
and  
fill the space and time of nature with their own impacts  
and emissions of matter and energy to which nature  
has to adapt.*

On the other hand, there were many poems in this collection that Pentti used multiple times in various different connections over the years. One particularly noteworthy example is this poem:

*Time flows  
to the present  
from two directions,  
from the future and  
from the past,  
as thoughts and  
the world.*

Later on Pentti extended this poem considerably and gave it the title ‘When Time Becomes Reality’.<sup>18</sup> In the 1980s he explained the poem as follows:

‘Reality consists not only in our sensory experiences at any moment in time, but also in the thoughts, impressions and ethical and social values we attach to these experiences, and in what kinds of wishes and ambitions we set for the expectations of our new experiences.

Furthermore, our personal realities consist in important part in how we view and experience the people with whom we live – the realities of those closest to us. In this way their realities come to shape and are interwoven with my, our reality.

People’s shared reality can thus be described as a process in which realities are formed and as interactions of different realities within this process. Reality is a dynamic event of becoming and an experience of that becoming, not a constant, invariable state of affairs.

The flow of past time is always rapid and strong and constant, and its aim is to make reality constant as well. The flow of future time, by contrast, is erratic, gushing and variable in intensity, uncertain; but it is only this that can bring about the change and discontinuity of the future.’

The following poem from *Open and Fuzzy Systems* has also been cited in connection with interviews published of Pentti:

*For a fleeting moment  
once, twice  
I thought I had understood.  
But time and again  
I noticed that  
there’s still reason to live.*

---

<sup>18</sup> A longer version of this poem is presented in the first pages of this book.

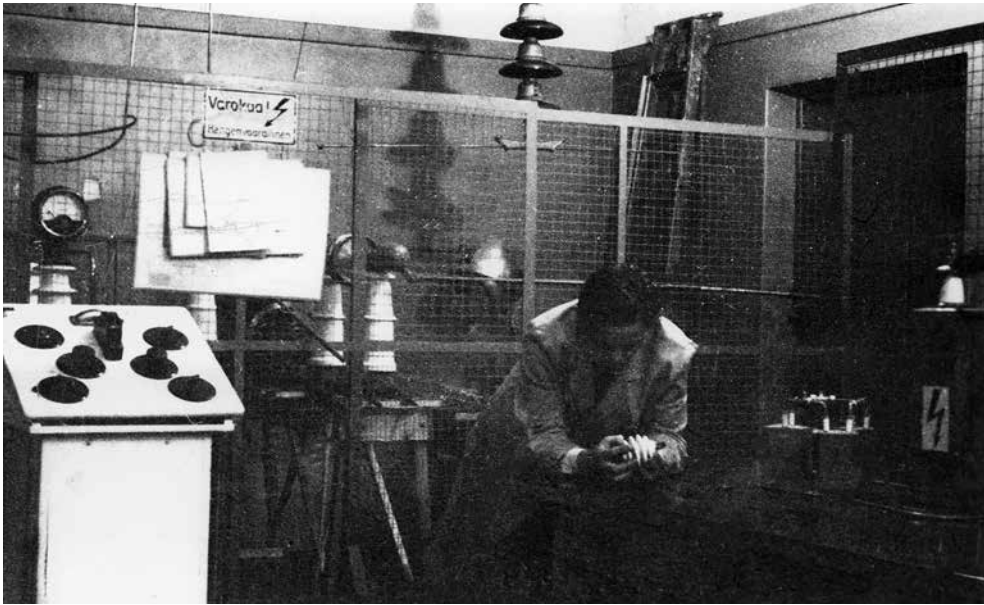
In an interview with weekly news magazine Suomen Kuvalehti on 3 September 1999, Pentti said the following poem summed up his life's philosophy:

*A MESSAGE TO HUMANKIND*

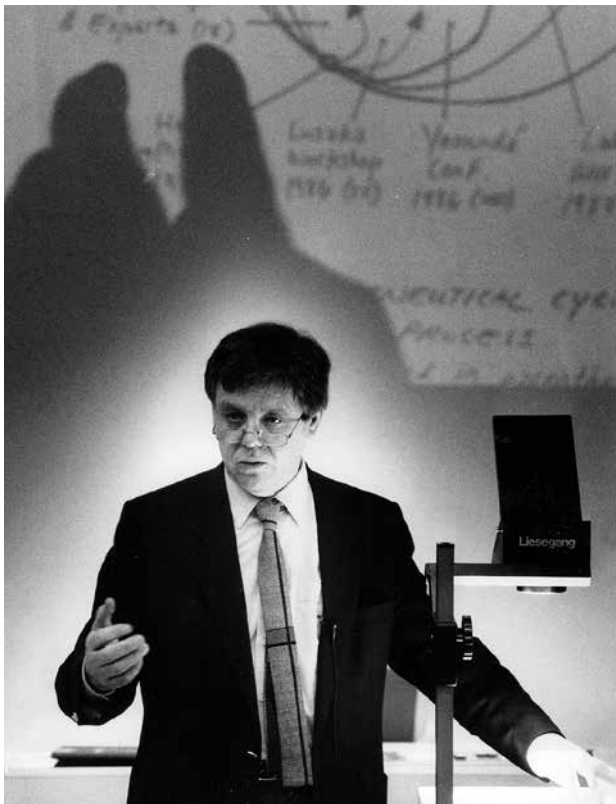
*The mission of a human being is to prove  
that human life is a valuable part of life in general,  
that life  
is richer and more precious with humans than without*



The Malaska brothers in summer 1941.  
From the left, Juha age 8, Martti 4 and Pentti 7 years.



A young Pentti in an electrical laboratory.



Pentti giving a lecture on the deleterious effects of economic growth in 1989. (Photo Jyrki Valkama, Turun Sanomat)



Honorary doctorate graduation ceremony at the University of Vaasa on 9 June 2006.



Honorary doctors procession.





Members of Pentti's thesis circle share a toast:  
Tapio Reponen, Pentti, Paavo Okko and Ilkka Virtanen.



The Finnish Cultural Foundation award was presented to Pentti for his 'vision, foresight and trailblazing work' on 27 February 2009.



Honorary doctorate graduation ceremony at Tallinn University in 2010.



Pentti's speech of thanks at Tallinn University.



Pentti in-between swims in Madeira in 1998: the all-important Financial Times and cup of coffee.



Pentti haggles for a deal in Tunisia in 2000.



Pentti's beloved summer retreat Mälinsaari in Luumäki.  
(Photo Stepi Sundberg)



Pentti was always keen to follow the many forms of life in the island's forests.



Pentti teaches his grandchildren the art of hugging trees.



Pentti and grandson Heikki on father's day in 1988.



Pentti and granddaughter Eeva at Mälinsaari.



On the lake in Mälinsaari in 1988.



Pentti's mother visits Mälinsaari in 1991.



Pentti and doctoral student preparing for sauna in Mälinsaari in 2005.



Pentti at Strömsö summer retreat in the Raasepori archipelago in 2011.  
(Photo Stepi Sundberg)

### 3. FUTURES CONSCIOUSNESS AND KNOWLEDGE OF THE FUTURE

**Pentti Malaska**

*Article originally published in: Heinonen, S. – Kuusi, O. & Salminen, H. (eds.) (2017) How Do We Explore Our Futures? Methods of Futures Research. Acta Futura Fennica 10. The Finnish Society for Futures Studies, Helsinki.*

#### **Focus on the future**

The future is not something that can be observed with the senses or captured via memories, yet we consider it to be real in some essential way. To be aware of the future, we must use mental functions that are not dependent on sensory information or memory. Awareness of the future – the aspect of time that exists alongside the present (what can be experienced) and the past (what can be remembered) – has been passed down to us by our distant primate ancestors, a heritage in which very few researchers have taken an interest.

In evolution spanning millions of years, a futures consciousness was passed to the human species. Over the hundreds of thousands of years that followed, humans evolved an innate ability to consider the future and ask what the ways of thinking and acting are that help us understand this aspect of reality. Futures consciousness is not possessed by only a few chosen ones but a characteristic that is typical of the entire human race. This observation has formed the foundation for the development of futures research in Finland as both academic pursuit and civic activity.

However, futures researchers hold differing views on what knowledge of the future is, particularly in relation to academic data; how valid information on the future can be garnered; and how such information can be distinguished from guesstimates, predictions, and other scientifically invalid or unfounded assumptions.

Sceptical attitudes toward the possibility of having knowledge of the future occasionally manifest themselves as harsh criticism levelled at the entire field. One example of such criticism is Robert L. Park's article 'Future Schlock', which sparked widespread interest when it was published in *The New York Times* in 1997<sup>19</sup>. Futures researchers have traditionally not been very good at responding to negative or even uncalled for criticism because giving an adequate response would require

---

<sup>19</sup> Park, R. L. (1997) Future Schlock. *New York Times*, 30.12.1997.



more profound philosophical knowledge of issues related to futures research than is possible in a field involving a myriad of research methods and a need to report study results rapidly.

Numerous academics, including Jacob Bronowski,<sup>20</sup> Riane Eisler,<sup>21</sup> Eleonora Masini,<sup>22</sup> Nicholas Rescher,<sup>23</sup> and Wendell Bell,<sup>24</sup> have pointed out the interest in the future that arose early on in human history. These researchers have extensively discussed the development of futures knowledge and its utilisation, yet more generally in futures research, study topics typical of basic research have not been given the prominence they deserve. In this article, I will discuss futures research from a perspective that is wider than the angle generally adopted or presented in applied research activities. I will also look at the development of futures consciousness and the organisation of modern futures research from this perspective.

## Who invented the future

Was the future created a few billion years ago with the Big Bang, along with time and space, or was it ‘invented’ later? And if it is of a later origin, who invented it, when and how? It can be said that when futures consciousness emerged in the human mind, it manifested itself as technology right from the beginning. The modern human takes it for granted that technology plays a major role in the understanding of both past and future.

Without technology, humans would not amount to much in their interaction with other species; in fact, without technology, we might not even exist as a species. Technology is often regarded as too narrow a concept: as a tool for a specific purpose or as human skills or actions linked to the use of tools. When considering knowledge of the future, we must, however, talk about technology in a broader and more profound sense than as something merely instrumental.

This broader, Heideggerian sense has been dubbed the essence of technology. With reference to Heidegger’s analysis of the essence of technology, humankind’s planetary role may involve either restricting evolution or expanding and deepening it consciously; this depends on how humans understand and are aware of themselves

---

<sup>20</sup> Bronowski, J. (1974) *The Ascent of Man*. Little, Brown; Boston.

<sup>21</sup> Eisler, R. (1987) *The Chalice and the Blade*. Our History, Our Future. Harper Row, San Francisco.

<sup>22</sup> Masini, E. B. (1993) *Why Futures Studies?* Grey Seal, London.

<sup>23</sup> Rescher, N. (1998) *Predicting the future: An introduction to the theory of forecasting*. State University of New York, Albany.

<sup>24</sup> Bell, W. (1997) *Foundations of Futures Studies: Human Science for a New Era*. Vol. 1, History, Purposes, and Knowledge. Transaction Publishers, New Brunswick and London.

and the essence of technology.<sup>25</sup>

## Enlightenment

Humans' unsurpassed skills as developers of technology and the conflict that is brought about by these skills are brilliantly depicted in Stanley Kubrick's film *2001: A Space Odyssey*.<sup>26</sup> The opening scenes of Kubrick's film give us a clue to who invented the future: in the film, 'the future' was brought from outer space as a mystical, incomprehensible stimulus into the midst of primates' reality governed by blind evolution around four million years ago. This stimulus aroused awareness and pushed primates' evolution in a new direction.

In an impressive scene showing how awareness is awakened, two tribes of primates and their leaders are engaged in an argument over a drinking spot, with both sides making threatening gestures. The leader of one of the tribes is acting defiantly, stomping his feet on the ground, screaming and growling at the other leader, who has mustered the courage to approach the water's edge while the rest of his group observe the situation from some distance. The pounding of feet sends all kinds of debris flying into the air, apparently the more the better.

Among the debris is a thighbone, which shoots high above, spinning through the air. The leader glances at the bone without registering any interest and continues to scowl at his opponent. But then something marvellous and remarkable occurs. He takes another look at the bone, now on its way down, and becomes transfixed... something clicks in his brain. The thighbone, falling toward the ground, ceases to be a random that has flown into the air and becomes something more. Suddenly, he realises that he can use the bone to defend the precious access to water against the outsiders – it becomes a tool.

The scene is an impressive depiction of the awakening of awareness. The leader grabs the bone and, waving it threateningly in the air, boldly strides toward the pond. This provokes the leader of the other tribe to launch into an attack, with disastrous consequences. The attacker never knows what hit him on the back of the head, fracturing his skull. The tribe who lost their leader quickly scatter, leaving the water behind in fear of the new, incomprehensible power the other group

---

<sup>25</sup> Heidegger, M. (1993) *The Question Concerning Technology*. In: Krell, D. F. (ed.) *Martin Heidegger: Basic writings: From Being and time (1927) to The task of thinking (1964)*, 307–342. HarperSanFrancisco, San Fransisco.

Peltari, M. (2010) *Martin Heidegger: Tekniikka ja käänne*. Niin&Näin -lehden julkaisusarja. [Martin Heidegger: Technology and transition.] <http://netn.fi/kirjat/martin-heidegger-teknii-ka-ja-kaanne>, accessed 5.4.2012.

<sup>26</sup> Kubrick, S. (1968) *2001: The Space Odyssey* (film).

have gained all of a sudden. The conflict and contradiction inherent in technology shown in the film is brilliantly analysed in the study 'Kubrick 2001: The space odyssey explained',<sup>27</sup> which also hints at a solution.

## **Futures consciousness and the essence of technology**

Natural objects do not give clues as to how cleverly they might have been used at any given time or whether skills in using these objects would have been passed on to others, turning the skills into a typical characteristic of the species through learning. For millions of years, various species of primates had to gain similar insights, which also had to leave their mark on the brain and be passed down through the generations before the future was 'discovered'.

Archaeological findings that can be interpreted as indicating that the future had been 'discovered' first appeared around 2.5 million years ago. The 'discoverers' were not humans, even though the material evidence of their 'discovery' represents what might be termed the cutting-edge technology of their time. This evidence consists of tools made of flint. These can clearly be regarded as cutting-edge technology: not only was their manufacture and use something entirely new and innovative, but the objects also provided their owners with many new applications and new skills, giving them a competitive edge in the blind, mechanical selection process of evolution.

At the latest, the future was invented around 2.5 million years ago when a species of hominids, *Australopithecus garhi*, became the first to learn to make tools of flint. Over the next few million years, other hominids honed this technology.<sup>28</sup> Accordingly, our futures consciousness is the evolutionary heritage of the creativity and talent developed by early hominids millions of years ago.

Of course, the futures consciousness was not a feature of the hand-made tool itself, an object made of flint. The future was conceived of by the minds that came up with the idea of preparing tools. To take up manufacture of tools, hominids needed to have motivation and a sense of a goal, the recognition of a need that was

---

<sup>27</sup> Kubrick, S. (2001) *The Space Odyssey explained*. <http://www.kubrick2001.com>, accessed 5.4.2012.

<sup>28</sup> Coppens, Y. (1995) Brain, locomotion, diet, and culture: how a primate, by chance, became a man. In: Changeux, J-P. – Chavillon, J (eds.) *Origin of the Human Brain: a Fyssen Foundation Symposium*. Published in *Symposia of the Fyssen Foundation*. Clarendon Press, Oxford.

Lemonick, M. D. & Dorfman, A. (1999) *Up from the Apes*. *Time magazine*, 23.8.1999.

Lombardo, T. (2006) *The Evolution of Future Consciousness*. AuthorHouse, Bloomington.

Malaska, P. (1997) *Global Conversations – What You And I Can Do for Future Generations*. *Futura* 16/1997, 62–64.

not present in the here and now. Tool-makers also needed to know where to find suitable material and how to detach and work pieces of it.

Finished tools were not discarded after use, as natural objects were. All of this can be deduced from archaeological findings. Tools were looked after and stored for further use. When awareness of the goal and the value of the tool for further use emerged, the future was born. The future – a state of mind – found a physical manifestation in tools and in what they represented to the mind: advantage, creation, safekeeping, maintenance, protection, and preparation.

Flint technology evolved. Yves Coppens has assessed the development of technology over long time periods by measuring the length of tools' cutting edge. This measurement grew from the earliest findings' 10 cm of cutting edge per kilo of flint to 2,000 cm when *Homo sapiens* appeared.<sup>29</sup> These findings show that progress took place in great leaps, in cycles spanning hundreds of thousands of years, with eras of rapid development coinciding with the enlargement of hominid brains. This indicates that biological evolution and technology progressed hand in hand and possibly in interaction with each other. The correlation seems to have undergone a change around 150,000 years ago, when the human brain stopped growing. If anything, human brain size has slightly decreased since then. In the following verses, I sum up the essential content of the events in relation to their future-significance:

*Blind evolution  
in a never-ending present without a future  
made us into creatures different from all others,  
capable of learning.*

*We conquered the planet,  
turned it into our lebensraum,  
Which made us different from all others.*

*Will we continue blind,  
in a never-ending present,  
or will we take responsibility for the future of the planet  
together with others?  
There lies the conflict of becoming a human.*

---

<sup>29</sup> Coppens, Y. (1995) Brain, locomotion, diet, and culture: how a primate, by chance, became a man. In: Changeux, J.-P. & Chavillon, J. (eds.) *Origin of the Human Brain: a Fyssen Foundation Symposium*. Published in *Symposia of the Fyssen Foundation*. Clarendon Press, Oxford.

## Modern futures research

Heidegger and Kubrick pointed out that a futures consciousness which is tied to the value currently accorded to technology, its commercial instrumentality, is restricted and narrow in scope in comparison with the true richness of reality, turning technological advances into mere superficial progress. Heidegger said that our view of the essence of technology is today narrower than that of ancient Greece, where the word 'techné' referred not only to objects used in an instrumental manner but also to the arts, including sculpting, poetry, drama, and literature.

Consciousness being tied to commercial instrumentality turns the development of mankind – and the entire planet – into a mechanical chain of events, progressing without alternatives as blind evolution, the way it did before humans evolved the awareness. Ethical choices become estranged from the essence of existence, resulting in a future for humankind and all other species that is a pre-determined *futurum* instead of a multiplicity of future.<sup>30</sup>

Humans must not stop evolution; instead, they should turn it into a process with conscious choices, which requires progress to a new level ethically, socially, and with regard to knowledge. We have to learn to recognise and value other aspects of reality and the future besides the material one, rather than aim to eliminate them. Modern futures research has emerged in order to raise awareness of these possibilities and to unlock them in people's minds.

Opinions vary as to when modern futures research came to be. Bell<sup>31</sup> considers the Enlightenment to mark the beginnings of modern futures research. He bases this opinion on the moral and ethical emancipation and the ethos of progress typical of that era, along with utopie and dystopie presented at the time. As another possible starting point for futures research, Bell offers the early 1900s and the writings of H.G. Wells, whose *Anticipations of Reaction of Mechanical and Scientific Progress upon Human Life and Thought*, published in 1902, sparked widespread interest in matters of this nature.

Wells also proposed, in the 1930s, that universities should set up departments and professorships of futures studies. In *The Evolution of Future Consciousness*<sup>32</sup> Thomas Lombardo casts his vote for H.G. Wells as one of the fathers of futures studies. The times mentioned by Bell and Lombardo are both important

---

<sup>30</sup> Masini, E. B. (2009) Luis De Molina as a Precursor of the Basis Philosophical and Ethical Thinking in Futures Studies. *Futura* 1/2009, 6–14.

<sup>31</sup> Bell, W. (1997) *Foundations of Futures Studies: Human Science for a New Era*. Vol. 1, History, Purposes, and Knowledge. Transaction Publishers, New Brunswick and London.

<sup>32</sup> Lombardo, T. (2006) *The Evolution of Future Consciousness*. AuthorHouse, Bloomington.

milestones in the history of modern futures research, but some central ideas did emerge earlier. Toward the end of the 16th century, the philosopher and theologian Luis de Molina proposed the existence of several alternative futures as a logical possibility and, in fact, necessity in his *Concordia* (1589), which deals with the question of free will.

In an article published in 2009, Masini presented a thorough analysis of de Molina's ideas and their significance from the perspective of modern futures research. The existence of numerous possible futures – *futura* instead of a single *futurum* – means that from the perspective of the present time, there are several possible outcomes for the future. The term de Molina introduced to describe this idea is 'conditional future contingents'. The heated debate that ensued from this discussion within the Catholic Church had to do not with futures research per se; the question was one of free will and the theological basis for its existence. In 1611, the Pope declared the debate unresolved after several decades of to-and-fro argument. Masini emphasises how the basic concept of numerous possible futures, developed by a number of futurists over a span of several years, which forms the foundation of modern futures research, can be traced back to the 16th century via de Molina's writings.

In his seminal work *The Art of Conjecture*, Bertrand de Jouvenel contributes to the concept of alternative futures by introducing the term 'futuribles' to refer to the range of possible futures: the group of possible futures that could come into being from the starting point of the present state of affairs. The following extract from de Jouvenel's work clarifies the concept:

"There are many future states of affairs which we have no reason to regard as impossible; it follows, in accordance with the law of contradiction, that we should regard them as possible. But a future state of affairs enters into the class of "futuribles" only if its mode of production from the present state of affairs is plausible and imaginable. A futurible is a *futurum* that appears to the mind as a possible descendant from the present state of affairs."<sup>33</sup>

The idea of the possible future as descended from the present also seems to have a neurophysiological basis. Washington University reported interesting findings in a press release speaking of memory and future thought going hand in hand, which indicated that remembering the past and envisioning the future may activate the same regions of the brain.<sup>34</sup>

---

<sup>33</sup> Jouvenel, B. de (1967) *The Art of Conjecture*. Basic Books, London. p. 8.

<sup>34</sup> Everding, G. (2007) Imaging pinpoints brain regions that 'see the future'. Memory and future thought go 'hand in hand'. Washington University in St. Louis News & Information. <http://news.wustl.edu/news/Pages/8448.aspx>, accessed 5.4.2012.

The correlation between neurophysiological functions and future consciousness has been brought up also by David Loye, in his book *The Sphinx and the Rainbow*.<sup>35</sup> Logically, 'being possible' from the perspective of the present is the predicate of a relevant future. Besides this, the various alternative futuribles may be assigned other properties too, such as being a probable, desirable, or undesirable future, depending on the context.

## **Futurology, foresight, and the terminology of futures research**

The concepts of foresight and futurology play a major role when we undertake to describe and analyse the field of futures research as a scientific pursuit, as is my goal with this article. Philosophical study and analysis of futures research can be regarded as the basic research in the field. Such study has been performed by researchers such as de Jouvenel, Ossip K. Flechtheim, and Bell in their books, and it features in 'Philosophical Essays of Knowledge of the Future', a special edition of the journal *Futura*.<sup>36</sup> Borrowing from Flechtheim, I call it futurology. In Finland, this concept has met with some opposition. I do not see any rational grounds for the criticism levelled at the term, as it is an artificial construct also in English, coined specifically to describe this concept. Flechtheim introduced it in 1946 in his writings on futures research.<sup>37</sup>

The word 'futurology' carried no meaning until Flechtheim gave it a rather apt definition, which I will discuss later on. It does not refer to the study of the future, and it should not be considered comparable with astrology, Scientology, or similar unscientific activities. It can, however, be spoken of in the same terms as sociology, biology, psychology, and other fields of science, the names for which have been formed with the suffix -logy.

Foresight refers to futures research in a way that deviates from the sense of futurology. The EU has defined foresight as 'a participative approach to creating shared long-term visions to inform short-term decision-making processes'.<sup>38</sup> The ENSTI database, maintained by the Finnish National Board of Education, describes the Finnish term 'ennakointi', used for foresight, as a word that is often used with reference to planning methods for purposes of distinguishing them from futures

---

<sup>35</sup> Loye, D. (1983) *The Sphinx and the Rainbow. Brain, Mind and Future Vision*. Bantam Books, New York.

<sup>36</sup> Malaska, P. & Masini, E. B. (eds.) (2009) *Philosophical Essays of Knowledge of the Future*. *Futura* 1/2009.

<sup>37</sup> Flechtheim, O. K. (1966) *History and Futurology*. A. Hain, Meisenheim am Glan.

<sup>38</sup> EFMN (2012) *European Foresight Monitoring Network*. [www.efmn.info](http://www.efmn.info), accessed 5.4.2012.

research proper.<sup>39</sup>

The Oxford English Dictionary defines foresight as ‘the action or faculty of foreseeing what must happen; prevision’ and as ‘care or provision for the future’ and traces the word’s origins to the 14th century. Interpreted broadly, this corresponds with the word’s current usage in futures studies. As for ‘futurology’, the OED offers a definition as ‘the systematic forecasting of the future’. These dictionary definitions in no way contradict the definition cited earlier in the paper.

Foresight represents the current mainstream activity among experts and researchers as a management technique stemming from futures research and as a support system for planning and decision-making in organisations and institutions. This corresponds well with my view on futures research and my long-term experience of that field, both in its actual sense and with regard to planning and foresight.<sup>40</sup>

The third concept that is important for futures research as a field of science is futures research, when the notion is used to refer to research activities or research results. In English, two terms exist for the concept: ‘futures studies’ and ‘futures research’. Unlike the Finnish term, these terms make explicit the field’s focus on numerous futures instead of a single future. The term ‘futures studies’, which is in more common use, is often, though not always, used to refer to a research project that is less clearly defined and often adopts a qualitative approach, while futures research is often seen as a project that is defined more in terms of methodology and doctrine with a quantitative focus.

---

<sup>39</sup> Opetushallitus (2012) Ensti, Opetushallitus – Ennakoinnin sähköinen tietopalvelu ENSTI. [National Board of Education: electronic foresight information service.] [www.oph.fi/info/ensti](http://www.oph.fi/info/ensti), accessed 5.4.2012.

<sup>40</sup> Malaska, P. (1965) Aikasarjoihin perustuva tutkimus sähköenergian kulutuksen rakenteista Suomessa vuosina 1945–1963. [A time-series based study of the structure of electrical energy consumption in Finland 1945–1963.] Suomen teknillinen korkeakoulu, Helsinki.

Malaska, P. & Holstius, K. (2009) *Advanced Strategic Thinking. Visionary Management for Leaders*. Lap Lambert, Saarbrücken. Turun kauppakorkeakoulun sarja A-8:2004.



## The semiotic organisation of research

In the Figure below (Fig. 3), I have divided futures studies in three on the basis of my experience and the studies I am aware of: 1) topic-specific studies, 2) methodological studies, and 3) pragmatic futures research carried out to assist in decision-making. To these three categories we should add one more: 4) speculative futurological studies focusing on the analysis of concepts. Each study in the field of futures research is influenced by work in all of these categories but may have one of them as its main area of emphasis. In the figure, I list examples of research tasks and goals for each of these categories.

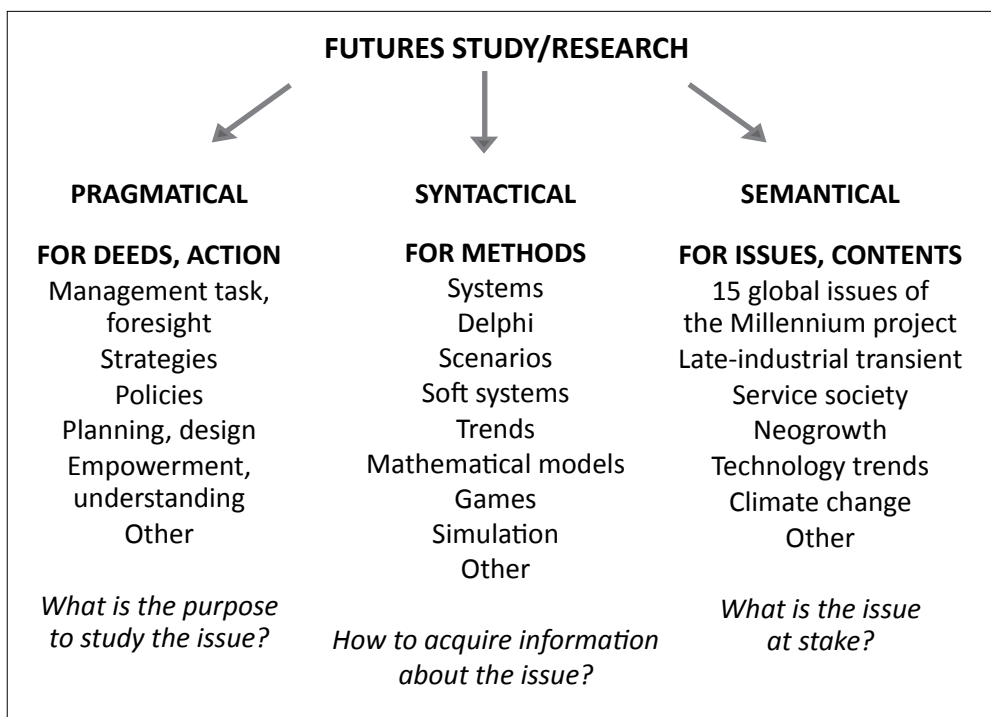


Figure 3. Research areas in futures research.

Next, I present a summary of the key terms in futures research.

**Futurology** is basic research in the field, philosophical studies on the basic hypotheses of futures research, and speculative research into the development of various real-world phenomena performed at least to some extent in compliance with the principles of Flechtheim's methodology.

**Futures studies** and **futures research** are generally understood as involving any academically disciplined research in the field.

**Foresight** is applied futures research carried out to provide tools for decision-making. It is a participatory method used to create a shared long-term vision for a company or institution. It also includes preparation for and commitment to the strategic, short-term decisions required by this vision.

## The Millennium project as an example

The Millennium Project offers an apt illustration of the grouping I have presented above. It is an international futures research project involving numerous partners and active cells in various countries, including the Finland Futures Research Centre (FFRC), in Turku.<sup>41</sup>

The project, which has been in progress for 20 years, is headed by Jerome Glenn and Theodore Gordon, who are among the world's most renowned pioneers and developers in the field. An annual report, *State of the Future*, is released as output of the project. This introduces the future visions of various partners, along with views on a range of topics collected by means of the Real-Time Delphi method.

According to the Millennium Project, the 15 most significant global issues, representing the main challenges for futures research, are sustainable development and climate change, purity of water, population growth and natural resources, advancement of democracy, long-term perspectives, global information technology, the income gap between the poor and the rich, health, the ability to reach decisions, peace and conflict, women's status in societies, organised cross-border crime, energy, advances in science and technology, and global ethics.<sup>42</sup>

The Millennium Project has compiled a handbook of methods for futures research, which is added to and developed annually. The work is 'the largest, most comprehensive collection of internationally peer-reviewed methods and tools to explore future possibilities ever assembled in one resource'.<sup>43</sup> It thereby contributes to method. In addition to this, the fruits of the project include country-specific foresight reports, a contribution to pragmatics.

The Millennium Project has had long-term involvement in all the branches of futures research listed in the figure. In its experiences and reports, the project has accumulated and synthesised views on topical futures, a process that is prerequisite to scientific activities. Some of the Millennium Project's announcements about the tasks of futures research can be compared to comments made by Flechtheim 60 years ago.

---

<sup>41</sup> Millennium Project (2016) [www.stateofthefuture.org](http://www.stateofthefuture.org), accessed 28.1.2017.

<sup>42</sup> Glenn, J. C. – Gordon, T. J. & Florescu, E. (2011) *State of the Future 2011*. Millennium project, Washington D.C.

<sup>43</sup> Millennium Project (2010) *Futures Research Methodology*, Version 3.0.

## Research areas and method in futurology according to Flechtheim

Not only did Flechtheim introduce the concept of futurology in the 1940s,<sup>44</sup> he also outlined the central issues in research in the field and presented some methodological basic assumptions of futurological futures research (methods). According to him, research topics typical of futurology include:

1. Elimination of war and ensuring institutional safeguarding of peace;
2. Eradication of hunger and poverty;
3. Stabilisation of the global population;
4. Advancement of democracy in societies;
5. Protection of nature against exploitation and protection of humans against their own actions; and
6. Prevention of alienation through creation of the opportunity for a new, creative *Homo humanus* to arise.

It is noteworthy that this list includes the same topics of futures research as the 15 challenges specified by the Millennium Project 60 years later, with the exception of some items made topical by advances in technology. I find this an interesting observation on the continuum of futures research.

Flechtheim sums up the methodological assumptions that form the basis for knowledge of the future as four points:

1. The world is dynamic in such a way that not only its temporal state but also its basic structures change. These changes give rise to new possibilities for humans' intentional actions and interests.
2. These changes may be recognisable beforehand, and their direction and speed can in some instances be foreseen to an extent.
3. Forecasts and projections that do not correspond to the developments in the real world (antithetical forecasts) also have some value: they can contribute to the clarification of problems and understanding of consequences of crises.
4. Humans have the freedom of choice to shape the future within a framework constrained but not determined by the past.

As for pragmatics, Flechtheim's writings have contributed less to the current stage of development of foresight and other applied pragmatic futures studies, which in part illustrates the difference between futurology and foresight.

---

<sup>44</sup> Flechtheim, O. K. (1966) *History and Futurology*. A. Hain, Meisenheim am Glan.

## Knowledge of the future

I now turn to my view to knowledge of the future. Knowledge of the future is more general in nature than knowledge in fact-based scientific disciplines (mathematics, the natural sciences, the social sciences, history, and the humanities). Accordingly, futures research requires researchers in the field to generalise the concepts of knowledge and reality and to develop methods for validation of their own knowledge on the basis of these generalisations. For more detailed analysis of the problems involved with knowledge of the future, I refer the reader to the piece ‘Determinism and knowledge of the future’,<sup>45</sup> by philosopher Georg Henrik von Wright, while the article ‘Modern futures approach’<sup>46</sup> presents a comparison between the scientific nature of futures studies and the nature of other academic disciplines.

Knowledge of the future refers to visionary knowledge of contingent, intentional, and non-factual phenomena. It does not contradict objective or other factual scientific information that is relevant for the research. For this very reason, the idea of knowledge is more general in nature in futures studies than in other academic fields. From the perspective of generalised scientific knowledge, futures research does, however, constitute a scientific area of knowledge.

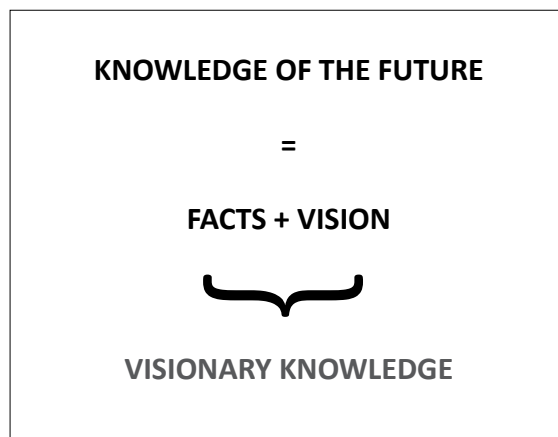
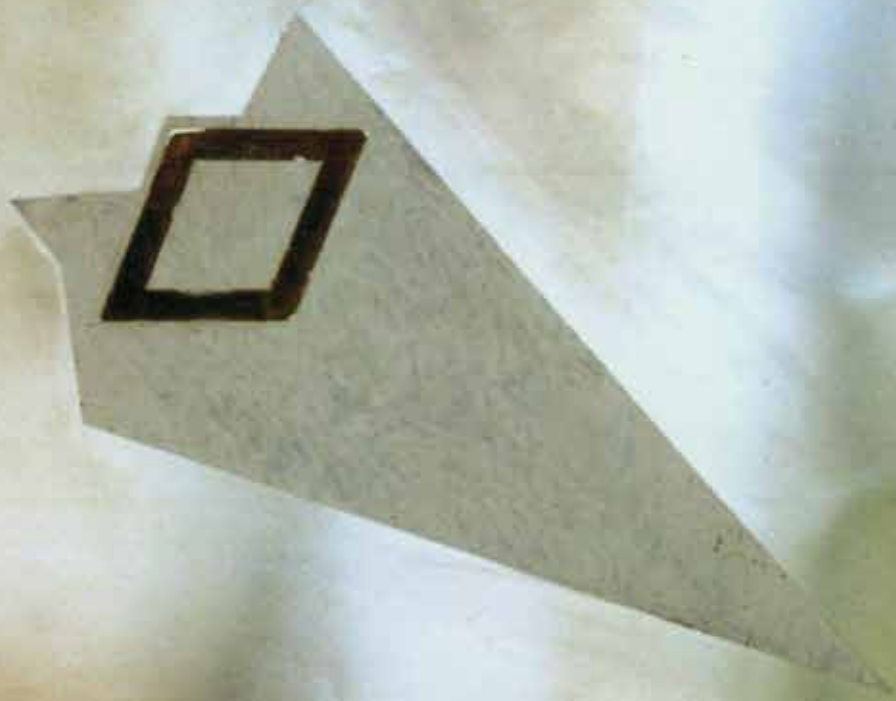


Figure 4. The relationship between knowledge of the future and other scientific knowledge.

<sup>45</sup> Wright, G. H. von (2009) Determinism and the Knowledge of the Future. *Futura* 1/2009, 15–27.

<sup>46</sup> Malaska, P. & Holstius, K. (2009) *Advanced Strategic Thinking. Visionary Management for Leaders*. Lap Lambert, Saarbrücken. Turun kauppakorkeakoulun sarja A-8:2004.



PART II

THE THREE CHALLENGES  
OF SUSTAINABLE  
DEVELOPMENT



## 4. REPAIRING HUMANKIND'S RELATIONSHIP WITH NATURE

**Laura Pouru**

*Humans originally lived in nature as natural creatures and on nature's terms. They then learned to live off nature, conquering it for themselves and making the most of the opportunities it provided. With modern development, untouched nature has disappeared and been replaced by environment, a scientific and technological variant of nature that humans have conquered and harnessed. The environment is a huge source of resources and at once a space for human activities and waste. There no longer exists, anywhere in the world, nature that is beyond the reach of human activity, unchanged and unaffected by human activity. Any islands that remain in a natural state are just technically controlled special environments resembling nature.<sup>47</sup>*

Perhaps the most central overarching theme in Pentti Malaska's research concerned the relationship between humans, nature and technology. In the 1960s, as nature was increasingly being plundered by man-made technology, Pentti turned his thoughts to the future of the world. This provided the first spark for his futures thinking and his career-long interest in futures studies. Keen to find a solution to the distorted relationship between technology and nature, Pentti set out to develop his idea of a natural technology, modelled on the process of natural circulation. It was by virtue of these ideas that Pentti was invited to join the Club of Rome in 1972.

Pentti's aim was to jolt people into realizing that our society's relationship with nature must be repaired if we wish to build a sustainable future for humankind on earth. He was concerned that the technosystem humans had created would continue to expand to a point that eventually, it would exceed the bearing capacity of the world's ecosystems. He called upon humans to assume their responsibility for building a sustainable future, a responsibility that came with their consciousness. The biggest obstacle to building a sustainable relationship with nature, Pentti thought, was the ideology of constant growth, a sheer impossibility on our finite planet. By way of an alternative to constant growth, he developed a theory of neo-growth: the idea of growth within the bounds of the world's bearing capacity.

---

<sup>47</sup> Pentti's article. Kanava (7/1995) Tulevaisuuden vedenjakajalla. [On the watershed to the future.]



## Humans separate from nature

*As well as having created the technosystem and at once a new conception of nature, humans are also, to an ever increasing extent, creators of their own technology. Nature, in its original sense, no longer exists for modern humans. It has become unnatural, a special environment that, with great effort, is maintained by means of technology.*<sup>48</sup>

Pentti defined the human-nature relationship via the human-built technosystem. By technosystem, he meant the system of technology that humans had built as a counterpart to nature's ecosystem. Although humans have not intended and designed their technology as a system, technology nonetheless influences humans and nature as just such an independent system. As we do not fully understand how this system works, we also lack a clear picture of its effects, but since technology implements the goals of being human, attitudes tend to be positive.

The following series of figures and associated texts describes the various stages in the development of ecosystem–technosystem interaction, beginning from the days when humans were still an integral part of the ecosystem. The discussion concludes by outlining two alternative futures that the expanding technosystem might lead to on our finite planet. The figures and texts are borrowed directly from Pentti's article on 'Harmonious human–nature interaction'.<sup>49</sup>

***At the stage of ecosystem predominance** (Fig. 5), when humans do not yet exercise a self-conscious influence on nature, everything is controlled by the ecosystem because it is everything – it is an indivisible system in which even humans do not constitute an essentially distinct part. The material existence of humans was initially controlled not only by the same invariant laws of nature as the rest of the ecosystem, but also by the cosmic initial boundary conditions set by or prevailing within the ecosystem, which were beyond human interference. This unconscious dependence of humans on nature is a prevalent feature of ecosystem predominance.*

---

<sup>48</sup> Malaska, P. (2001) Ihmisen ja luonnon harmoninen vuorovaikutus. [Harmonious human-nature interaction.] In: Heinonen, J. (ed.) Luovaan tasapainoon, 38–50. [Towards creative balance.] Ekosäätiö, Pieksämäki.

<sup>49</sup> Malaska, P. (2001) Ihmisen ja luonnon harmoninen vuorovaikutus. [Harmonious human-nature interaction.] In: Heinonen, J. (ed.) Luovaan tasapainoon, 38–50. [Towards creative balance.] Ekosäätiö, Pieksämäki.

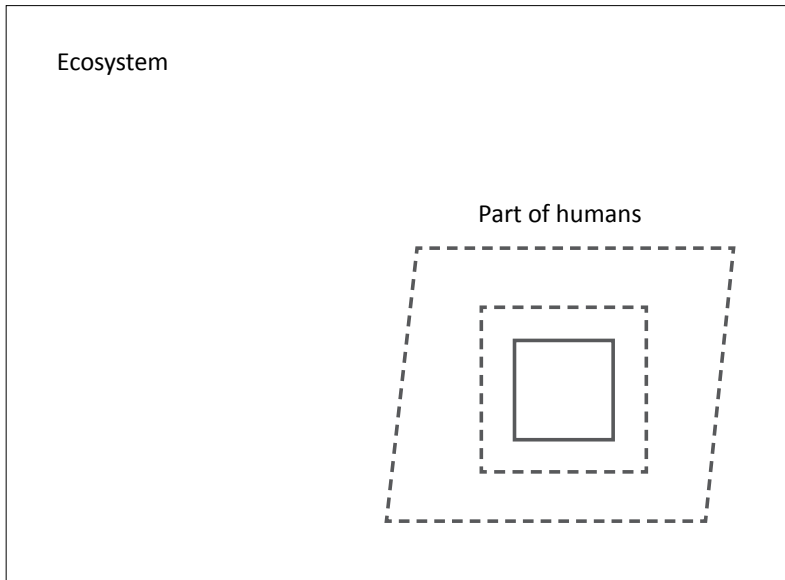


Figure 5. Stage of ecosystem predominance. The part of humans follows the same shape as the ecosystem, humans are an inseparable part of endogenous nature.

***The stage of technosystem expansion** (Fig. 6) began when rational human thinking began to gain momentum with the manufacture of tools and the evolution of language. Rational thinking became a 'tool' for discovering natural laws in the corresponding way as the senses serve as a tool for discovering facts. This tool helped humans discover the secret behind observable facts; they learned to recognize facts as expressions produced by invariant laws and as specific materializations of those laws under certain boundary conditions. And more than that, they learned how these materializations could be engendered and produced according to their own will and goals, including materializations that had never occurred in nature before. Humans didn't do this by changing natural laws or by producing new laws, but by learning to set appropriate initial and boundary conditions for the invariant laws. The appearances produced by these laws of nature, which have grown out of the human-imposed conditions of activity and phenomena, are here called technosystem.*

*The technosystem is 'unnatural' in the sense that the initial and boundary conditions for natural laws are imposed not by the ecosystem but by humans themselves, but as far as these laws of nature are concerned the system is just as natural as nature itself. Technological phenomena and natural phenomena observe the same natural laws, and in this sense technology cannot work against nature. However humans are now beginning to stand apart from the totality of the ecosystem.*

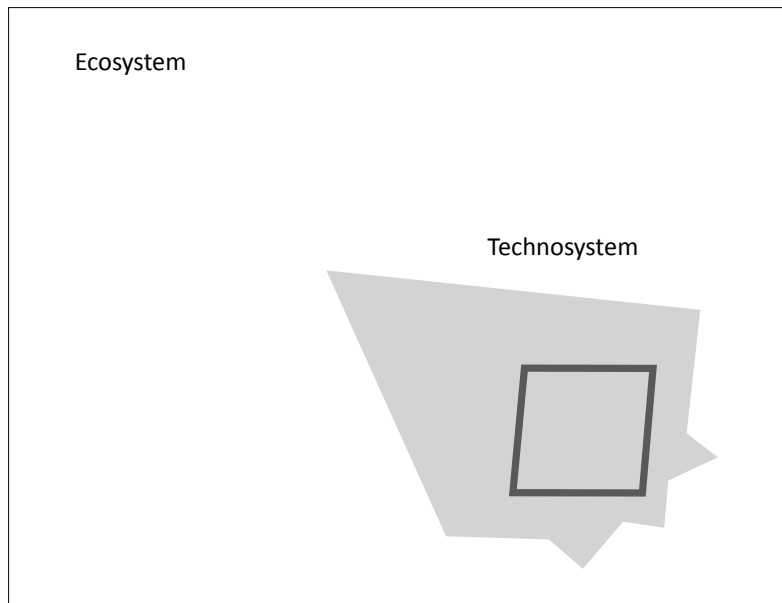


Figure 6. Stage of technosystem expansion. Humans themselves define initial and boundary conditions for the ecosystem laws that they know, creating appearances that do not occur in nature and via these appearances the tentacle-like expansion of their own part in nature. Humans become separated from nature.

*When rational thinking is applied to detecting laws, just as when the senses are applied to detecting facts, our knowledge and understanding remain incomplete; at any moment in time we can only make observations within a specified narrow segment. So when we set laws to operate under certain conditions, we do not know (or sometimes we don't care even if we know) what other effects other laws, known or unknown, may have under these same conditions and simultaneously with the operation of the law we do know. Our observational reality is partial and limited not only with respect to the observation of facts, but also the observation of laws. It could also be said that reality is a system of simultaneously operating and effective laws, but our observations at each moment in time are focused and can only be focused on one specific part of this system. Our knowledge consists of separate elements, interconnected interactions and the entity they constitute.*

***At the stage of technosystem expansion and ecosystem contraction*** (Figs. 7 and 8) it becomes apparent, after sufficient movement in a certain direction, that there exist certain kinds of boundaries that are observable before they are reached. There are both absolute and relative boundaries within the ecosystem vis-à-vis the technosystem: once the 'law of boundaries' has been detected, the ecosystem is no longer an unlimited or infinite entity in relation to the part of humans, but it becomes a limited environment that is influenced in many ways, both quantitatively and qualitatively, by the technosystem.

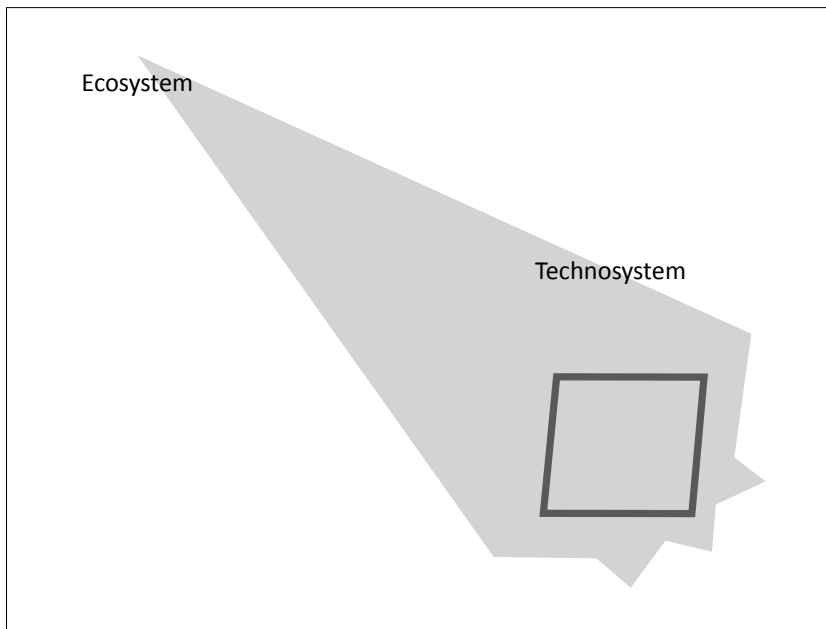


Figure 7. With technosystem expansion it becomes apparent that the ecosystem is finite and limited in relation to the technosystem. Nature transforms into the technosystem's environment.

*Constant technosystem expansion leads inevitably close to the ecosystem's absolute boundaries and beyond its relative boundaries. The transgression of the relative boundaries means that other than intended laws begin to operate on unintended conditions, causing completely unknown, transient or permanent consequences.*

*The ecosystem is cybernetic in nature, which means that it will seek to eliminate any systemic disturbances, first, through its own operation, i.e. by maintaining its capacity for endogenous structural change. Once its relative boundaries have been breached, ecosystem self-regulation is no longer possible or adequate, and therefore the technosystem may cause situations where the only possible ecosystem response is to change its own dynamic course of events and structures at the same time. For this reason the situations in which the effects of the technosystem seem to extend beyond the relative boundaries of the ecosystem are critical warning points that require attention. It is also necessary to note that at the same time as some technosystem tentacles are pushing towards the ecosystem's boundaries, the whole technosystem is continuing to expand in relation to the ecosystem. Unless we can expand the ecosystem in relation to the technosystem, this means that part of the ecosystem will be contracting – and we don't know what this means for the ecosystem or for us.*

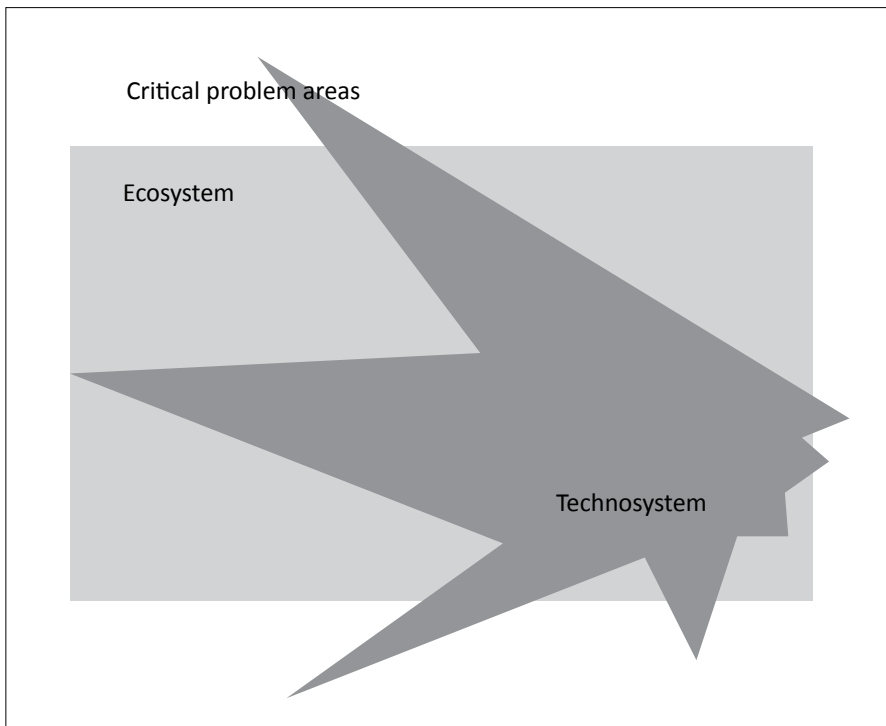


Figure 8. Stage of technosystem expansion and ecosystem transgression. The tentacles of partial technosystem knowledge transgress the relative boundaries of the ecosystem, and nature is reduced to a special environment maintained by the technosystem.

*In the first possible future scenario (Fig. 9), it is thought that humans react to the facts presented as if they contained no message of any real threat. The technosystem will develop and expand based on its partial knowledge and eventually breach the relative boundaries of the ecosystem, possibly at multiple points. As a result the ecosystem will attempt to absorb the disturbance, but since the disturbance is already too large for the system's capacities for natural self-regulation, it will spill over and cause structural changes in the ecosystem and technosystem. In the worst case there will only remain a few separate functional islands within the ecosystem.*

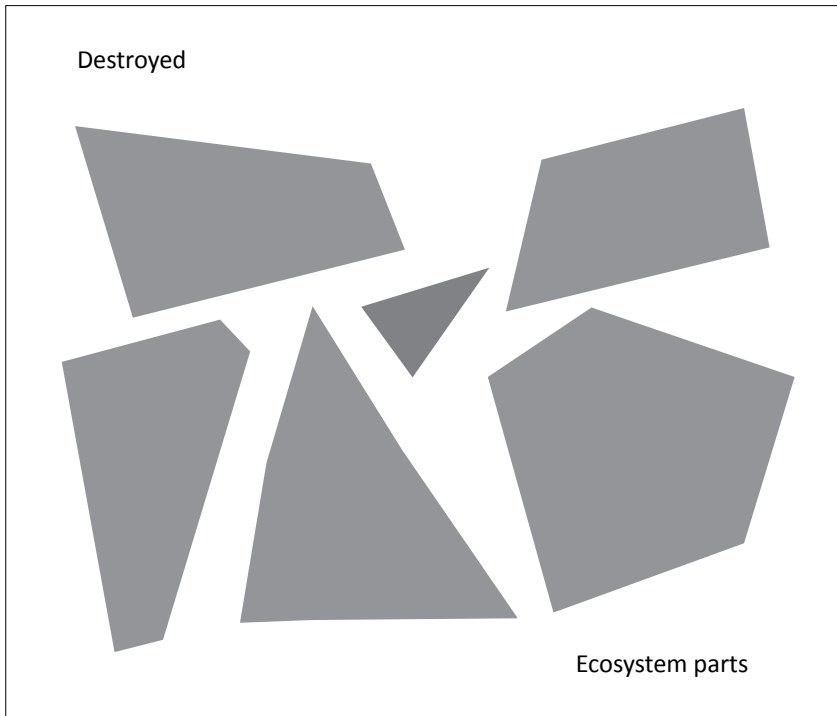


Figure 9. Future scenario where the ecosystem's capacity for self-regulation is not taken into account in the technosystem. Boundary transgressions have spilled over into structural changes to which humans themselves are sensitive.

Nature has been restored to its original state without humans.

Nature does not need humans.

*The second future scenario (Fig. 10) works from the assumption that humans have started early enough to search for answers and solutions to a situation they have brought upon themselves through their own actions and to reconstruct the part of humans – their technosystem – in a new way which takes into account the ecosystem's shape requirements and the conditions of harmonious human–nature interaction. This means they will have to, first, eliminate the tentacles of partial knowledge that are threatening to expand and, second, accept new attitudes and forms of social life that are necessary for harmonious interaction. Nowadays this principle can be regarded as the idea of postmodern progress and as a necessary moral condition for sustainable development.*

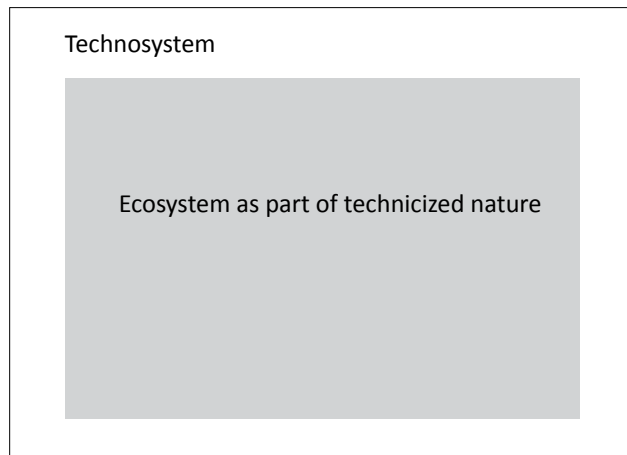


Figure 10. Future scenario where the former, ecologically correct and permanently functional structure has been restored in the human technosystem. 'Nature' as a human construct. Humans need nature.

Pentti addressed and illustrated the scale change in the relationship between the human-built technosystem and the world's natural ecosystem in several interviews. This is an excerpt from an interview with *Teollisuus* magazine in 1979<sup>50</sup>:

*In the 1930s, when humankind's influence on nature was like a mosquito compared to an elephant, it made no difference where it 'pricked' nature. All problems were local and nature soon sorted them out. But when humankind's power and influence vis-à-vis nature increases to the point where it's one elephant against another elephant, it does begin to matter how one pushes the other one around. And if we grow into a herd of ten elephants against that single elephant, then we'll certainly begin to represent a danger if we show aggressive behaviour.*

Pentti's theory of the ecosystem–technosystem relationship inspired Kimmo Ojaniemi to produce a series of artworks describing the same stages of development (see photos on page 80). The works were published in 1991 and were exhibited at the *Ekoviisari*-exhibition at the Wäinö Aaltonen museum in Turku. Today, two of these works occupy pride of place at the Helsinki offices of Finland Futures Research Centre.

<sup>50</sup> *Teollisuus* (5/1979) Luonnolla on takaisiniskumekanismeja – Kasvun ajatus on arvioitava uudelleen. [Nature has kickback mechanisms – The idea of growth must be reassessed.]



Kimmo Ojaniemi's works were inspired by Pentti's theory of changes in the ecosystem–technosystem balance. They were exhibited at Ekoviisari-exhibition at Wäinö Aaltonen museum in 1991.





## Towards a solution: natural technology

*Nature is billions of years old, the technosystem just a couple of hundred years old. Even so this younger system is causing harm to the whole ecosystem and ultimately to itself, the ecosystem has not done that. In the search for alternatives, a sustainable way ahead for technosystem development, we inevitably come to the question of whether it would be possible to model a solution on natural systems. What would a natural technology involve?*<sup>51</sup>

Pentti saw in natural technology a tool that would allow humans to assume their responsibility for the future of the world, a responsibility that came with their ethical consciousness. From the earliest stages of his career in the 1960s Pentti took a special interest in the relationship between technology and nature, in which nature was very much exploited as a disposable resource. This started him thinking that technology needed to be improved and developed, and Pentti began to conceive his ideas of a natural technology. Natural technology is based on the idea of modelling technological development on the process of natural circulation. It was by virtue of these ideas that Pentti was invited to join the Club of Rome in the early 1970s. Since the 1970s, Pentti actively advocated the view that nature should not be used as a disposable commodity, but that we should develop technology in a manner that promoted recycling and reusing materials in a circular economy. This is how he described the principles of natural technology in an article published in the general interest science magazine *Tiede* 2000 in 1990<sup>52</sup>:

*We have to get more and better out of less if we want to ensure humankind's continued existence on Earth. We have to be able to satisfy our needs with less energy than we are currently using, by saving natural resources and causing less environmental damage. We need new, better technology.*

*Humans' technological skills have developed by trial and error, through experimentations and successes. For a very long time, until the natural science revolution, knowledge used to drip through to technology via experience, without the help of scientific research. Technology developers did not understand the general laws behind their inventions, nor were they aware of the side effects and other consequences of using them. Now, it is impossible to find sound and sustainable solutions for technology development unless the consequences are consciously taken into account. The focus of engineering must be firmly placed on technology itself: it must be seen as an entity, a system that regulates both the global interaction between humans and nature and human material*

<sup>51</sup> Pentti's interview. Etelä-Saimaa 6.2.1990 Luonnonmukainen teknologia – vastaus ihmisen ja luonnon ristiriitaan? [Natural technology – the answer to the human-nature conflict?]

<sup>52</sup> *Tiede* 2000 (7/1990) Luonnosta mallia tekniikkaan. [Nature provides model for technology.]

activities, their nature and opportunities. In what follows I outline a technology that can create sustainable development. I call it natural technology.

Technology is the way that humans use matter, energy and space to their own advantage. Nature itself uses these elements in its operation; it's been doing so for billions of years longer than humans. The human way – modern technology – and the natural way differ decisively. Modern technology is not a natural technology, it is far more primitive and imperfect – and therefore destructive. Natural technology is modelled on nature's ways of using matter, energy and space. It's based on the following natural principles:

- The **circulation** of matter on Earth is a closed circuit in that it comprises both the growth and degradation of organic matter.
- The Earth gains sufficient energy from the Sun. This energy – particularly its distinctive property of **exergy** (force of change) – is put to effective use in operations that in nature guarantee sustainable development, continued evolution.
- All natural processes necessarily and constantly generate 'waste' and disorder, **entropy**, but the problem of accumulation is avoided.
- Entropy, energy and exergy each shed light on the capacity of natural resources and natural phenomena for change. Entropy is always created, and it consumes exergy, reducing the prospects of creating new order. Entropy within the finite part of the universe is liable to increase because of the material processes occurring within it. This law of nature ties both economic growth and technology to its unyielding necessity:
- Every material event, no matter what its purpose, always detracts from the quality of the matter and energy involved, i.e. creates new entropy. When disorder accumulates the continuity of events is thrown into jeopardy.
- Once produced, entropy cannot be destroyed, only increased.
- Entropy can be transferred from one place to another – from environment to system or from system to environment – and it can be stored (e.g. in the form of waste and risks).
- The entropy of matter can be reduced, i.e. order can be created in matter by consuming exergy, whereby the entropy of the energy used to this end will increase.

Communities can grow in size or achieve higher levels of material welfare only by increasing entropy and by consuming exergy. However, the accumulation of disorder within their own circle imposes limits to this growth. We are in a relationship of ex-

*ergy and entropy exchange with nature. Continued positive development can only be guaranteed under conditions of sufficiently effective exchange. However, with the advance of pollution in nature, nature's ability to create new order is reduced. Modern technology consumes nature at an accelerating rate by accumulating its entropy inside the system. Exergy-containing natural resources are being depleted, and there no longer exists the necessary space into which entropy could be transferred.*

Humans and technology, too, are governed by the laws of the universe and nature. Indeed, Pentti argued that the technosystem should be based on the premise of complete circulation of matter and efficient solar energy use. Pentti's theory of natural technology is based on three elements: the renewable circulation of matter, the efficient, multi-stage use of solar energy, and the exchange and transfer of entropy into space. Key is the circulation of matter in production and consumption so that it does not become useless or turn into pollution at any stage. Pentti thought that the breakthrough and acceptance of this principle should be the ambitious goal of all present-day technology professionals.

*All in all the whole planet and its biosphere constitutes a single functional system or, one might even say, living organism. Over billions of years it has processed vast quantities of matter and energy. Yet it has still not accumulated nearly as much entropy within itself as human technology has in just 200 years, having consumed infinitesimal quantities of matter and energy compared to natural circulation.*

*The fact of the matter is that even many of our decision-makers still have no clue of what entropy, for instance, is about. Which is that waste, in one form or another, is created and that it is necessary to prevent its accumulation within the system. This problem cannot be resolved simply by increasing the efficiency of energy use, sooner or later we have to develop a circulation system that works entropy into the form we want and 'ventilates' it out of the system.<sup>53</sup>*

Pentti believed that Finnish hi-tech was well placed to develop natural technology. In particular, he believed that microsciences could provide a more in-depth analysis of events in animate and inanimate matter. However, he did not think that any one discipline could alone implement natural technology, as nature itself does not break down into separate areas. Instead, Pentti considered it important that the evolving new knowledge base is put to use in its entirety and that efforts are made on this basis to develop hybrid technologies that are modelled on nature. In an interview he gave in 1990, Pentti mentioned a number of practical examples in the development of natural technology: the collection of waste and the development

---

<sup>53</sup> Suomen luonto (2/1991) Luonnonlait tekniikkaa palvelemaan. [Natural laws in the service of technology.]

of improved methods for sorting waste, increasing the efficiency of materials use in old production facilities, and the development of new raw materials efficient products, processes and production units. In addition, he insisted that there were many unnecessary features in consumer goods and that the service life of products could be and should be increased.

## From quantitative economic growth to the ideology of neo-growth

*The prevailing thinking since the war has been characterized by the belief that nature is boundless and in many way provides a source of almost free natural resources for humans. Humans cannot damage nature and there can be no shortage of resources. A second belief was that it is impossible for humans to create problems that they cannot solve by means of their technology. A third fundamental belief underlying post-war development is the notion of the intrinsic value of material living standards, economic growth. There has been no need to question the purpose of increasing material growth. In fact such questions have been considered absurd and pointless.<sup>54</sup>*

*The requirement of growth is accepted as a given truth, even though in reality it's only just an attitude. Supporting growth is considered a neutral premise. Opposing growth, on the other hand, is considered whimsical fanaticism.<sup>55</sup>*

Pentti actively criticized the ideology of constant economic growth on our finite planet. He considered the idea absurd in its impossibility. In a column in Turun Sanomat in 1995<sup>56</sup>, he offered the following criticism of the policy of growth and competitiveness:

*Growth almighty brings instant additional wealth to companies – provided that they are competitive on the service value market. Economic growth slows the growth of unemployment, and strong enough growth actually increases employment. When it is mitigated, the need for basic provision is reduced and there is no need to raise taxes. Growth therefore at once makes possible a social development where the rich get richer and the poor make progress. The internal logic of the policy of growth is thus firmly grounded.*

---

<sup>54</sup> Pentti's interview. Teollisuus (5/1979) Luonnolla on takaisiniskumekanismija – Kasvun ajatus on arvioitava uudelleen. [Nature has kickback mechanisms – The idea of growth must be reassessed.]

<sup>55</sup> Pentti's interview. Savon Sanomat 9.6.1990 Poliitikot määräävät vain vauhdin – Teknokraatit suunnittelevat yhteiskuntaa mieleisekseen. [Politicians only determine the rate of advance – technocrats are shaping society as they please.]

<sup>56</sup> Turun Sanomat 24.7.1995 Eettiset valinnat kehityksen pohjaksi. [Grounding development in ethical choices.]

*It is only the unspoken conditions under which growth can occur as expected, and the absence of those conditions which renders unreasonable any expectation of growth even if it happened, that begin to cause cracks or difficulties in this policy. The first question that needs to be asked is whose purchasing-power-backed demand growth are we talking about? There are five billion people in the world with an infinite number of unsatisfied needs. Only a small proportion of these people have real purchasing power, only a small proportion of those needs are manifested as purchasing-power-backed demand. In the quest for growth, it's necessary to find that proportion in a new, turmoiled world. All countries have similar ambitions to solve their problems via a policy of growth. Is there enough demand backed by purchasing power to go around, and how do we secure our own share? How is demand that is backed by purchasing power distributed around the world, and how is it channelled into demand and supply?*

*These questions are most usually answered by reference to 'competitiveness'. The emphasis on competitiveness as a solution to unemployment is grounded in the assumption that the Finnish economy is something that can be controlled separately from the rest of the world, so that jobs and revenue generation in successful businesses or industries can be retained within state boundaries. Only on these conditions can international business success mean success for people living in Finland. But this is not necessarily the case any more in an increasingly globalized economy.*

*Growth almighty, as a global ambition, might also be impossible because of the destruction and damage caused to nature and the environment, unless the goal and ambition is shifted to ecomodernization and compatible sustainable growth. Growth may also be an inadequate way of making humankind's major ethical and moral choices concerning the eradication of poverty in line with the recommendations of the recent Copenhagen Summit. At the very least, the burden of proof in these issues rests with the policy of growth. Thirdly, new welfare indicators suggest that even though there has been continued robust economic growth since the 1970s, true welfare has no longer increased.*

*These counterarguments go to show that there is need now for a more broadly-based and deeper policy of international responsibility and sustainable development. The Finnish Committee of the Club of Rome has published a book on these issues: *Our International Responsibility, the Finnish Model*. The main message of the book is that our most important choices are not technical or economic by nature, but ethical and moral. The ideal of a decent life as a development objective presents us with a different set of choices than the goals of economic benefit or neutral technical progress. Growth is not excluded from these choices, but nor is it necessarily synonymous with development any more.*

For Pentti, talk about growth was outdated. He sought actively to spread the message of the differences in principle between growth and development, among other things by getting business leaders to recognize that it is more forward-looking to invest in the qualitative development of business rather than in its quantitative growth.

*It's a fateful mistake to believe that growth and development are the same thing. It's really dangerous for a company to regard growth as an indicator of development. Growth and development are no longer synonymous. You might just as well get on the scales every morning and say: I've put on weight again, haven't I developed!<sup>57</sup>*

*Growth or development, as a question for futures research, appear in my mind as two alternative realities: the option of growth, for me, represents a continuation of the past stream of time, whereas development draws from the future timestream and challenges us to change and reform. And reform can only happen, first, by facing threats and second, by creating real utopias. Development cannot be understood as synonymous with growth because development requires that some things have to stop, others have to slow to zero growth and others still have to grow. All of this at the same time. For this reason the concept of growth is too one-sided, too one-dimensional, hiding and concealing real problems and real opportunities. In other words, growth is one-dimensional where development is multidimensional; growth is quantitative where development is qualitative.<sup>58</sup>*

By way of a solution to the problems of constant growth, Pentti worked on developing the idea of neo-growth. Neo-growth is based on pursuing growth within the world's bearing capacity. It depends on increasing the efficiency of raw materials use (more from less), the growth of immaterial consumption, curbing population growth, lowering material standards of living and generally working towards a more sustainable and more future-conscious way of life. Based on these elements, Pentti believed that growth could be possible without the unsustainable exploitation of natural resources and energy.

*It seems we can't even let go of the concept of growth, no matter what. It's so deeply ingrained in our thinking as a necessity. If there is no growth there is only death. Not a single politician can make do without using the word 'growth'. This is why we need a new content for growth. This is what I have in mind with the word 'neo-growth'. And we have many good answers that have to do with the ethos of sustainable development*

<sup>57</sup> Aamulehti (date unknown) Pentti Malaska ennustaa Wärtsilälle seuraajia – Kasinotalous tuo yllätyksiä. [Pentti Malaska expects to see followers to Wärtsilä – the casino economy brings surprises.]

<sup>58</sup> Keskiuomalainen (1993) Professori Pentti Malaska: Suomen lama ei ole pelkkä suhdannejuttu. [Professor Pentti Malaska: Finnish recession not just a cyclical downturn.]

*and the growth of those things that is required by observing this ethos.*<sup>59</sup>

The idea of neo-growth has been developed further in research projects at the Finland Futures Centre Research. These are described in more detail by Sirkka Heinonen in Chapter 11.

Discussing the need for change in the growth paradigm, Pentti often pointed out that it is necessary to give up something before something new can take its place. A favourite example of his was the Chinese ideogram for crisis. It consists of two separate symbols, one of which means danger, ending or risk, and the other means opportunity, birth and the beginning of something new (Fig. 11). Pentti wanted to use this example to press home how crisis and change always involve not only a threat, but also an opportunity:

*The first symbol, used on its own, means threat, danger, risk, ending, or something frightening that we'd all want to get out of and stay away from. This is roughly how we usually understand crisis. The latter symbol, on its own, refers to the birth of something new, a beginning and opportunity, or the complete opposite to the first symbol. And crisis is both of these together.*

*This may be interpreted such that in a crisis, it's necessary to dare to understand and accept what has run its course, to dare to end it and so clear the space for emerging new opportunities. Development involves passing through both symbols. The old is euthanized to become fertilizer for renewal and regeneration.*<sup>60</sup>

---

<sup>59</sup> Malaska, P. (2011) Joku innovatiivisempi suunta on jäänyt huomiotta. [A more innovative direction has been ignored.] In: Grönroos, R. (toim.) Uuskasvua ymmärtämässä – kutsu kestävään tuottavuuteen, 186–196.

<sup>60</sup> Malaska, P. (2009) Taloustiede ja talouskriisit – kommentteja keskusteluun. Kommenttipuheenvuoro Luonnon filosofisen seuran seminaarissa. [Economics and economic crises – comments on the debate. Comment at Finnish Society for Natural Philosophy seminar.] Helsinki, 17.2.2009.





Figure 11. The Chinese ideogram for crisis includes both threat and opportunity.<sup>61</sup>

*Our thinking around the word 'crisis' has become rigidly fixed. Under conditions of crisis the tendency is to destroy anyone who comes forward with deviant ideas rather than trying to understand what it was that they said. The Chinese bring something positive to the word crisis that we don't have. For this reason I prefer to refer to a period of transition. We must be able to terminate that which has run its course so that we can clear the space for the new. In this sense we're trapped in two symbols, faced with two sets of difficult decisions. What do we need to terminate in order to create a new positive beginning and what could this new positive be?<sup>62</sup>*

<sup>61</sup> Malaska, P. (2009) Taloustiede ja talouskriisit – kommentteja keskusteluun. Kommenttipuheenvuoro Luonnon filosofisen seuran seminaarissa. [Economics and economic crises – comments on the debate. Comment at Finnish Society for Natural Philosophy seminar.] Helsinki, 17.2.2009.

<sup>62</sup> Malaska, P. (2011) Joku innovatiivisempi suunta on jäänyt huomiotta. [A more innovative direction has been ignored.] In: Grönroos, R. (toim.) Uuskasvua ymmärtämässä – kutsu kestävään tuottavuuteen, 186–196. [Understanding neo-growth – an invitation to sustainable productivity.] TeliaSonera Finland Oyj, Helsinki.

## 5. PUTTING THE COMMON DEVELOPMENT OF HUMANKIND FIRST

**Laura Pouru**

*We in Finland have been living in separation from humankind's common community of fate. This has nothing to do with geographical periphery, but spiritual and mental distance from the realities prevailing in humankind. We're not left with many opportunities to postpone learning and improving our interaction. It's imperative that we work to improve our skills and abilities to constructively face realities that are alien to ourselves – including the future.<sup>63</sup>*

Pentti Malaska wanted to instil in people a sense of planetary consciousness, of global responsibility for the future of humankind. He wanted people to understand that we're all in the same boat and that we should work together to solve our increasingly complex global problems. Pentti was involved in the Club of Rome for more than 40 years from the 1970s onwards. Through the Club of Rome, he was involved in addressing the social structural problems underlying African poverty, for instance. For Pentti, one of the biggest challenges to the progress of collective planetary consciousness was the escalation of market economy into capitalism and the attendant growth of social and welfare polarization. Pentti was also concerned about the legacy of risks that would be left to future generations as a result of nuclear power, and about the uncritical attitudes of state decision-makers to nuclear power. He wanted to build a Finnish energy policy and energy policy debate that was more firmly grounded in and informed by research evidence.

---

<sup>63</sup> Pentti's interview. Keski-suomalainen 23.1.1994 Suomalaisuuden harharetket. [Odysseys of Finnish identity.]

## Market economy or capitalism

*Market economy and capitalism are driven by the same source of energy: the individual's private interest and greed. But they are aimed at completely different goals: market economy is geared to growing the nation's prosperity, capitalism to growing the individual's personal wealth regardless of, and even at the expense of, the nation's prosperity. In both cases greed is like a fire driving the achievement of the goal. Capitalism, however, is like a blaze out of control, destroying its environment. Market economy and its boundary conditions are like a heating system with a fire going in its furnace, distributing the heat produced to many. Adam Smith's insight was that private greed can be harnessed to generate prosperity for the whole nation by building and maintaining suitable boundary conditions in society. These observations, I suggest, signal the need for a reanalysis of the foundations of market economy, so that the development of the economy, both real and symbolic, can be maintained on a steady market economy course and prevent capitalism from gaining traction.<sup>64</sup>*

Pentti Malaska took the view that capitalism's ruthless exploitation of natural resources and the pursuit of personal interest presented a major threat to the future of humankind and the world. In the 1980s and 1990s, he levelled sharp criticism against the rise of the casino economy and capitalism. He aimed to raise awareness about the difference in principle between market economy and capitalism so that it would be possible to prevent market economy from morphing into capitalism. Pentti stressed the role and responsibility of society in maintaining the boundary conditions of market economy. The late 1980s upswing and the 1990s recession, he said, served a lesson to all Finns about true capitalism, where profits are private but losses are public. In 1993 he gave this description of the difference between market economy and capitalism in the business journal *Talouselämä*<sup>65</sup>:

*Failure to recognize the difference between market economy and capitalism will hamper society's efforts to develop market economy, and economic recovery will be delayed even more. Market economy requires specific measures by society in order to exist, and its best chances of success, perhaps only chances of success are under conditions of democracy. Market economy is a social institution, not a mechanism that evolves with private business companies. Companies operate in a market economy if such an economy exists, or without a market economy. Any measures aimed against democratic decision-making will also present a threat to market economy. Capitalism, on the other hand, requires no measures by society, nor indeed does it require democracy. They are just a hindrance. Capitalism thrives both in dictatorships and on the ruins of socialism.*

<sup>64</sup> Pentti's article. *Turun Sanomat* 26.9.1994 *Markkinatalous ei ole kapitalismia*. [Market economy is not capitalism.]

<sup>65</sup> *Talouselämä* (25/1993) *Markkinatalous vai kapitalismi?* [Market economy or capitalism?]

*For the purposes of drawing a distinction between market economy and capitalism we can justifiably turn to the principles of market economy set out by Adam Smith. Smith did not need the word capitalism in the first place. Capitalism only came into common usage as part of Karl Marx's doctrine, in which it served as the dialectical counterforce to good. In this sense talk about capitalism is an ongoing search for understanding based on Marx's doctrines.*

*Market economy can be said to have three basic principles: the pursuit of self-interest, free competition in an unmanipulated market, and ethical business responsibility. The first item in this list can be considered the most fundamental tenet of private enterprise and market economy as a whole. Market economy is based on private enterprise, which has its foundation in free and private ownership. The latter are by nature boundary conditions set by society for free enterprise. Under these conditions, private enterprise becomes an exercise in market economy that is consistent with consumer interests. In contrast to capitalism, then, market economy is not ultimately aimed at growing private wealth, but rather at promoting the common good via the pursuit of self-interest. For it to serve as a rational means to achieve the goals set, Adam Smith says it is necessary to ensure that the two boundary conditions mentioned are and remain in place. This is something that can only be done by society.*

*Capitalism and market economy share a similar basic tenet regarding the primacy of self-interest. The difference is that capitalism is indifferent to whether the pursuit of self-interest creates anything other than self-interest. Capitalism is not about growing the wealth of nations, but accumulating private wealth. For market economy, by contrast, self-interest is just a means to an end. As far as capitalism is concerned, all boundary conditions that may hamper the accumulation of private wealth, for whatever reason, must be opposed and circumvented. Indeed, capitalism can be defined as consisting in this attitude of greed and as corresponding actions. It may become institutionalized via a power elite that has obtained the power to advance its own objectives, like drug barons in Columbia, corrupt businessmen and politicians in Italy, etc.*

Pentti stressed that ethical choices were the single most important underlying force of the economy. He criticized capitalism not only for widening the welfare gap between developing and developed economies, but also for increasing welfare polarization within developed countries.

*At the moment capitalism is thriving. There is no effective world community to lay down a common set of ethical rules, nor is there any effective mechanism for monitoring competition. Capitalism's degrees of freedom are undermining conditions and the position of individual countries in the global economy. A market economy on a global scale is still waiting to be born and to evolve.*

*We in Finland have lots of areas that are protected from competition, but it's fair to say*

*that we and Western countries in general have aimed towards an ethical market economy. But capitalism is putting up stiff resistance. We have to have a clear and clean separation. It's possible to execute a robbery with technical skill and sophistication, but it's still a robbery. Talk like this will make the hackles rise on many a business manager, but many independent and small-scale entrepreneurs in particular will recognize the truth in this.*

*If there's no public debate in society to shape and channel ethical principles into citizens' conscious choices, then ethical entrepreneurs won't cut it. Ongoing discussion and debate about principles is the bedrock of an ethical market economy. This discussion must also be reflected in legislation and taxation, which are the kind of institutional solutions via which the market economy is steered.<sup>66</sup>*

*The imbalance between the poor south and the rich north has remained essentially unchanged for the past half a century, despite the growing recognition that this imbalance is unjust and unfair. It was previously seen as a positive value, a justified form of colonial exploitation of peoples of inferior race. True, there have been advances in many countries such as China, India, Malaysia, South Korea, etc., but also unfathomable failures in countries such as Argentina and elsewhere in Latin America, and seemingly intractable problems in many African countries. At the same time, the south-north conflict has expanded into what is known as the Fourth World – the rise of poverty amidst the abundance and opulence that advanced countries have seen with the growing momentum of capitalism.*

*Since the collapse of their social system and the escalation of amoral evolution, poverty has become rife in former socialist countries or so-called transitional economies. But poverty has also been spreading and becoming more serious in advanced economies, too – in the United States, Finland and other countries – where private interest has superseded solidarity on the scale of values. People have increasingly been left to their own devices, externalized as objects who don't belong to or who have only a loose connection to the economic system.*

*Even poverty has been successfully privatized, and its growth has contributed to accelerate economic growth. A global 'Fourth World' of poor people has grown up in the southern camp and 'joined' the Third World. This is part of globalization. Currently prevailing, ethically accepted liberalist values have it that there is nothing contradictory here, nothing that needs to be redressed, it's just evolution, and even political programmes are more interested to promote nonsolidary greed than to make sure ordinary people can take control of their lives. The morality of greed creates growth, which in turn is necessary in order to stay in power.<sup>67</sup>*

<sup>66</sup> Turun ylioppilaslehti 15.12.1989a Miltä Afrikka näyttää? [What does Africa look like?]

<sup>67</sup> Malaska, P. (2002) Eettiset valinnat vai evoluutio. [Ethical choices or evolution.] Lecture Studia Generalia Oecouniversitatis, 28.11.2012, Mikkeli.

## Solving global problems in the Club of Rome

*The optimism of the Club of Rome lies in it seeing and recognizing problems in their global context and in it searching for new institutional, technical and scientific solutions, as well as in it refusing to bury its head in the sand about the future, but instead applying the tools of research and dialogue to try and anticipate the future challenges facing humankind. Humankind does not lack knowledge or resources – the difficulties have to do with the short-sighted pursuit of interests, greed or indifference about nature, fellow human beings and the future.<sup>68</sup>*

Pentti was invited to join the Club of Rome in 1972. This happened at around the same time as the Club published *The Limits to Growth*, a report that sent shockwaves around the world. Commenting on the report to the media in the 1970s and 1980s, Pentti stressed that the report was no ‘confession of faith’, but intended as a starter to stimulate discussion and debate. He was pleased to see that the report had encouraged many researchers to view the world as a single entity and to expand their research models. He was more disappointed with the lack of interest shown by the political leadership in the ideas and actions of the Club of Rome. He thought that even business and industry representatives showed a keener interest in the Club’s ideas than politicians. In the 1990s Pentti was concerned about the Club of Rome’s dwindling role and significance as an instigator of public debate. In 2009, on receiving an award from the Finnish Cultural Foundation, Pentti shared these recollections of the Club of Rome:

*I was invited to become a member of the Club of Rome in 1972. This became for me a university of thinking about the future and humankind. I see my membership of almost 40 years as a great privilege in my life. The Limits to Growth report was published at the 1972 meeting, the first one I attended. It was a commando attack against the hegemonic ideology of growth and gave rise to a whole number of new reports around the world. Russian and Chinese translations of the report broke through ideological barricades and prompted debate in other socialist countries as well. It was unheard of. The Limits to Growth is still topical today. The debate is continuing.<sup>69</sup>*

In the context of the Club of Rome Pentti was involved in research projects aimed at finding solutions to the challenges thrown up by global problems. One of the most significant projects in the 1980s was focused on Africa. It was concerned with the complex structures lying behind the drought and famine in Africa.

<sup>68</sup> Pentti’s opinion piece. *Talouselämä* (31/2004) *Rooman klubi ei iloitse*. [Club of Rome not celebrating.]

<sup>69</sup> *Tammenlastuja* (1/2009) Pentti Malaska – *Ennalta näkijä, edellä kulkija*. [Pentti Malaska – Leading the way with vision and foresight.]

*Africa, for all its misery, is a real laboratory for humankind. Poverty destroys nature, albeit in a different way than Western affluence. Nowhere is nature under such threat at the moment as in Africa; nowhere have so many places been so completely destroyed. The reason lies in people's extreme poverty. White man's models have been exported to Africa and used to govern Africa. This did not stop when Africa transformed into independent states. An indigenous African model has not been able to develop – so far. It remains to be seen whether one day that will become possible. It's clear from the misery that the models exported to Africa from the outside don't work. 'Everyone out of Africa. Leave them to their own devices', someone says. In practice that cannot happen. It would only mean that the most unscrupulous businessmen and men of power would plunder Africa even more than today.<sup>70</sup>*

On completion of their work the research team published a book called *Africa Beyond Famine*, which Pentti considered his most important written work. It outlines a model of social change that would help Africa get onto its feet. The model is based on a simultaneous analysis of economic, political and cultural structures and understanding the phases that societies go through in their development. These phases of development are discussed in more detail in Chapters 1 and 6. The sectoral model of social dynamics is outlined in Chapter 1. This model is based on the classification of society into three sectors: the economic sector, the socio-political sector, and the cultural sector, all of which contribute essentially to society's overall interest. Pentti's model of social change was developed first and foremost as a critique against earlier development theories that were too narrowly focused on economic factors. Pentti was critical of development policy that was based on the premise of economic growth:

*The Brundtland Commission's report includes a dual fallacy of the blessings of economic growth, a double fault. Firstly, economic growth in developing countries guarantees nothing, because the social conditions in those countries do not allocate growth to anything sustainable, but merely to bolstering the power positions of the urban elite, to equipping armies, etc. Secondly, it is clear from the global trade outlook that there is no positive correlation between growth in rich countries and growth in developing countries.<sup>71</sup>*

*So can we expect economic growth to contribute to development and welfare in Africa? Economic growth and welfare have not gone hand in hand. Above all, changes are needed to the social policy system. The African elite follows the views of industrial countries. The elite, who want for nothing, consider the system from their own van-*

---

<sup>70</sup> Turun Sanomat 10.10.1987 Ihmissuhteet ja luovuus kunniaan. [Celebrating human relations and creativity.]

<sup>71</sup> Turun ylioppilaslehti 15.12.1989a Miltä Afrikka näyttää? [What does Africa look like?]

*tage-point, which does nothing to improve the position of the poor people. – It's clear that when the raw materials run out, industrial countries will make a quiet retreat from the poor continent.*<sup>72</sup>

In their final report on Africa Beyond Famine, Pentti Malaska and his co-editor Aklilu Lemma emphasize the importance of Africa's internal coherence and endogenous development. Pentti believed that development towards a service society will open up new development opportunities for African countries. He also believed that in the future, Western countries will have to turn around and learn from Africa.

*I think that attitudes of enterprise and collective responsibility will strengthen of their own accord, at the same time as opportunities for life control will improve. There's a tendency to regard the grey economy and informal work as typical of developing countries, that they are poor people's economics. So this is where we're supposed to turn in search of a model for the future? To a certain extent yes, definitely. Many developing countries have never reached the stage of industrial society as equal partners. In fact the service economy comes closer in its premises to their own economy than the industrial economy. Indeed, the service economy can probably contribute to narrowing development differentials and to reducing poverty.*<sup>73</sup>

However, Pentti believed that closing the gap between developed and developing countries was the developed countries' responsibility, as developing countries just didn't have the necessary resources. The inequality of humankind and the ever-escalating polarization between extremely rich and extremely poor people was one of many causes of deep concern for Pentti. He wanted to evoke in people a sense of global awareness about humankind's common fate.

*Humankind is crucified; the vertical bar of the cross is the imbalance between north and south, the horizontal bar is the hostility between east and west. This cross stands on Golgotha, a foundation formed by human exploitation of nature. We can't tell for sure whether crucified humankind is a liberator of nature or a murderer; whether the future promises admission to heaven or condemnation to hell. It is this uncertainty that lies at the heart of our ethical uncertainty. Do human beings have a positive contribution to make to this world as a whole – this is not a question that can be answered by reference to technology or economy, it is above all an ethical choice.*<sup>74</sup>

---

<sup>72</sup> Turun Sanomat 13.1.1989 Afrikan tyrmättävä talouden kasvun utopia. [Africa must reject utopia of economic growth.]

<sup>73</sup> Helsingin Sanomat 7.2.1997 Palvelusta uusi talouden perusta. [Services provide new foundation for economy.]

<sup>74</sup> Hengellinen kuukausilehti (11/1988) Eettisissä arvoissa ja uudessa tiedossa on ihmiskunnan toivo. [Hope of humankind lies in ethical values and new knowledge.]



Pentti borrowed this crucifixion metaphor from Aurelio Peccei, founder of the Club of Rome, and added his own metaphor of Golgotha as the ground for natural exploitation. The hostility between east and west was a reference to the Cold War tensions of the 1980s, but by the 2000s there was a new explanation for the metaphor: the growing divide between Islamic and Western conceptions of life. This is how Pentti explains the metaphor in 2002:

*Previously the East–West conflict was more clearly manifested in the form of the so-called Cold War between the Western capitalist world and the socialist and communist world. The political Cold War confrontation of superpowers held the world in a balance of terror, where each side often had opposing views about good and evil, right and wrong. This conflict has now been defused, but on its ruins remain people shattered by wars and violence, and out of its ashes has emerged a new conflict between East and West. This is manifested in a conflict between the Islamic conception of life and ambitions motivated from within this circle, and Western secularized and materialistic ways, their diffusion and exercise of power. Islam represents a current and future ethical challenge for the development of humankind in a positive sense, not just in the form of a threat of Islamic terror and war of terror. Religious and ideological fundamentalists are generally the bloodiest cultural phenomena known to the world.<sup>75</sup>*

In an interview he gave in 1992, Pentti refers to a Club of Rome report called *The First Global Revolution* and looks ahead at what the future will hold if nothing is done to address existing global welfare disparities. Among other things, he mentions the prospect of a massive influx of migrants set in motion by rising welfare polarization.

*The next generations will probably have to witness mass migrations on an unpredictable and unprecedented scale. They've already started: boat refugees are leaving from the Far East, Mexicans are slipping into the United States, Asians and Africans into Europe. In an extreme scenario, one might imagine countless hungry and desperate migrants landing on the northern shores of the Mediterranean. This may prompt a sharp rise in defensive racism in the receiving countries and encourage people to vote right-wing dictators into power. We must not allow this to happen. For this reason it is equally important to prepare the populations of rich countries to accept this reality as it is to increase development aid to poor countries.<sup>76</sup>*

---

<sup>75</sup> Malaska, P. (2002) Eettiset valinnat vai evoluutio. [Ethical choices or evolution.] Lecture *Studia Generalia Oecouniversitatis*, 28.11.2012, Mikkeli.

<sup>76</sup> Turun Sanomat 3.5.1992 Väkiluku kaksinkertaistuu alle ihmisiässä. [Population to double in less than a human lifetime.]



Aklilu Lemma from Ethiopia, Donald Lesh from the United States, Pentti and Eleonora Barbieri Masini from Italy at the Club of Rome's 10<sup>th</sup> anniversary meeting at the Accademia dei Lincei in Rome in summer 1978.



Zambian President Kenneth Kaunda serves coffee to Pentti at the Presidential Palace in connection with a Club of Rome seminar in Lusaka in 1985.



Eleonora Barbieri Masini, Aklilu Lemma and Pentti in conversation at a Club of Rome meeting in Paris in 1988.



Pentti's wife Karin, Orio Giarini, Orio's wife Kristina and Pentti at a Club of Rome meeting in Punta del Este, Uruguay, in 1991.

## Energy and nuclear power as an intergenerational value issue

*The nuclear power business enjoys greater economic benefits and greater political and media support in Finland than anywhere else. Many countries have actually banned nuclear power construction, and the climate of debate is critical. In Finland, the view of rationality is different. Even under the country's new nuclear energy legislation, the nuclear power business's and the state's liability for damage caused to citizens in the event of a major nuclear accident is inadequate. We are also the only country in the world that officially believes in the safe final storage of nuclear waste. The international nuclear business can therefore count on it soon being able to haul its nuclear waste over here, even from other locations.<sup>77</sup>*

Pentti Malaska was by training an electrical engineer, and he took an interest in energy issues from a very young age. In the 1960s Pentti served on a Finnish-Soviet committee for nuclear energy cooperation, and it was here that he came to realize the magnitude of the risks involved in nuclear power. This made him change his mind, and he took an active stance against nuclear power. He criticized nuclear power for its high degree of concentration, for its narrow focus on efficiency and for presenting a catastrophic threat. During his career Pentti contributed actively to energy research, compiled several reports on the energy sector and comments to government, and was actively involved in the energy policy debate in the media.

*Rapid progress is being made in the development of decentralized energy technologies, and the same goes for the use of renewable energy sources and the improvement of energy efficiencies. Europe has begun to make use of Russia's gas resources. The European energy market is being liberated, among others from the tether of nuclear monopolies as in France, and work is even underway to develop safer, small scale (200–400 MW) fourth generation nuclear technology for future needs. Finland, however, continues to rely on outdated and completely foreign nuclear technology and energy as its primary source of electricity generation. It's almost as if all intelligence here is in deep freeze as the country's official energy policy is rowing in the side current of the international nuclear business, against the main current of the trends of real developments and citizens' interests.<sup>78</sup>*

Pentti was particularly concerned about the one-sided reliance in Finnish energy policy on nuclear power. He thought there was not enough critical, research-based debate in the country on the alternatives for energy production, but energy policy

---

<sup>77</sup> Pentti's interview. Luonnonsuojelija (5/2005) Räjätävän tietämättömyyden kynnyksellä. [On the verge of explosive ignorance.]

<sup>78</sup> Helsingin Sanomat 16.12.2002 Energiateknologiat kehittyvät. [Energy technologies moving forward.]

making was overly dictated by the nuclear business. He called for an energy policy that served the nation's overall interests. For him, the construction of additional nuclear energy was like a single-issue movement that effectively undermined the development of new energy policy options. He was critical of the power elite in Finland for forcing through nuclear energy decisions as if they were necessary and inevitable, without offering any rational grounds or listening to what the people had to say.

*We're the world's cheapest place to do business with nuclear power. We're completely in the palm of the nuclear business. This hasn't been possible in any other country that has freedom of decision-making. One cannot but wonder how we've landed ourselves in this kind of irresponsibility.*<sup>79</sup>

*All the parties, including the Centre Party, have jumped on the uncritical bandwagon of nuclear euphoria and even infected ordinary citizens. The decision on a fifth nuclear power plant was forced through Parliament against the majority popular will on the back of government pledges to support renewable energies and assurances that the plant would be funded by the private industries that wanted it. This support package has remained empty rhetoric, and the investments in nuclear power have been funded by public sector enterprises. And now there's talk of a uranium mine to sweeten the deal on a sixth nuclear power plant. Given these terms, it might well happen. In this land of reactors, nuclear cheating is in great favour, and we're getting visitors from all around Europe to see how this has been achieved.*<sup>80</sup>

*We have the same attitude to the construction of additional nuclear power as we have to getting a bottle of Koskenkorva. Whatever the costs and whatever the consequences, it's always worth the money spent.*<sup>81</sup>

Pentti was concerned about the risks of nuclear power and the final deposition of nuclear waste, which would remain for future generations to carry. He criticized the safety philosophy in the Finnish debate around nuclear power, saying that the risks of a nuclear accident were completely ignored.

*The risks haven't been forgotten – Sellafield, Harrisburg, Chernobyl and countless 'near misses' make sure that this is not something that will be forgotten. But the attitude to risks is a different matter. Here, the official belief is that there is no risk of accident in Finland – we just need to be on our guard about Russia. This is a lie. In reality,*

---

<sup>79</sup> Keski-suomalainen 6.8.1989 Kuka kantaa vastuun energiapolitiikasta? [Who's responsible for energy policy?]

<sup>80</sup> Suomenmaa 10.5.2006 Kallis virheinvestointi. [An expensive misinvestment.]

<sup>81</sup> Suomenmaa 10.5.2006 Kallis virheinvestointi. [An expensive misinvestment.]

*the risks have been directly externalized to citizens. There have been no in-depth risk analyses, and the assessments offered by public officials are all the same and based on industry reports. The authorities assure us that there are no risks, much like a second hand car dealer who says there's an MOT certificate somewhere, but it's a business secret and can't be shown. This is the prevailing rationality of the exercise of power.*<sup>82</sup>

In 1987, working together with Pirkko Kasanen, Pentti contributed to a report which proposed an advisory referendum in which citizens would assume a certain responsibility for their decision to support or not to support nuclear power:

*Our proposal for a referendum is intended to make clear that, given the will to do so, the decision on a nuclear power plant can be put to citizens in such a way that everyone understands enough about the implications of different options to their well-being and can make a rational decision from their own standpoint. This goes well beyond decision-makers' earlier assumptions about citizens' judgement. However in this context we do not go into the details of practical implementation.*

*The referendum would concern the use and construction of nuclear power. The key is that the electorate (individuals and companies) would be required to make certain pledges based on their vote. Those in favour of nuclear power would undertake to assume personal and company liability in respect of their entire assets for the damage resulting from a possible nuclear accident. This pledge would be passed on as a legacy to the person's descendants for as long as the power plant in question is in operation. Those against nuclear power, for their part, would pledge to pay a higher price than supporters for the electricity they consume if the decision is made to build a nuclear power plant, but they would not assume personal financial liability for any damage. Citizens could thus make a decision based on their values, and therefore rational action would not require any technical or economic skills that they do not already possess.*<sup>83</sup>

Pentti brought ethics and values to bear upon the national energy and nuclear power debate, which unnerved those who thought that values and ethical considerations were irrational and had nothing to do with the matter. But Pentti believed that values and ethics were absolutely fundamental to people's opinion formation about complex issues such as nuclear power. He insisted that decisions on nuclear power should be addressed as an ethical issue, not just an economic and technical one.

*Strong conflicts of interest come into play in ethical decisions. That is why those who*

---

<sup>82</sup> Luonnonsuojelija (5/2005) Räjähävän tietämättömyyden kynnyksellä. [On the verge of explosive ignorance.]

<sup>83</sup> Malaska, P. & Kasanen, P. (1987) Ydinvoima – Kohtalon kysymys? [Nuclear energy – a question of fate?] Sarja B:63. Kauppa- ja teollisuusministeriö.

*hold the reins of power would prefer to keep questions of values under cover! Furthermore, I've clearly noticed that it's impossible for us to know when we are faced with an ethical question. We may think we're talking about something rational, technical or economic, even though there's clearly an in-built ethical choice involved. Because we don't know we're making a choice, we can't see that we could have arrived at a different decision.<sup>84</sup>*

*Almost all experts on energy issues have a natural science training and a deeply ingrained ultrapositivist way of thinking. They bracket out ethics and values from decision-making, yet admit in passing that they are of course part and parcel of ordinary life. There is a clear value conflict in the nuclear power debate and in the justifications offered for different positions. It seems that positions on nuclear power tie in with all the major problems embedded in energy policy issues, so they cannot be detached from the general energy policy debate. There are many aspects to energy issues that in decision-making require expertise first and foremost on the human condition.<sup>85</sup>*

*In practical energy policy decision-making and public policy-making more generally, the aim has been to satisfy the requirement of rationality by establishing a narrower rationality in each relevant field of technocratic expertise. – For this reason it is commonplace that in major projects such as nuclear power and the additional construction of nuclear power, or restrictions on the use of fossil fuels and the regulation of emissions, rational and consistent decisions will be sought by curtailing the range of experts and interests involved and consulted in a debate with the authority to make decisions, and by then arguing that this truncated rationality is an adequate description of the decision situation for the politicians involved in decision-making and for interested citizens. This kind of procedure takes values and objectives as given and leaves the decision to the same representatives of truncated rationality who constitute the core of expert power.<sup>86</sup>*

---

<sup>84</sup> Hengellinen kuukausilehti (11/1988) Eettisissä arvoissa ja uudessa tiedossa on ihmiskunnan toivo. [Hope of humankind lies in ethical values and new knowledge.]

<sup>85</sup> Turun ylioppilaslehti 17.11.1989b Riittääkö energia – riittääkö järki? [Do we have enough energy – do we have enough sense?]

<sup>86</sup> Malaska, P. – Kantola, I. & Kasanen, P. (1989) Arvot ja ristiriidat energiakeskustelussa. [Values and conflicts in the energy debate.] In: Malaska, P. – Kantola, I. & Kasanen, P. (eds.) Riittääkö energia – riittääkö järki? [Do we have enough energy – do we have enough sense?] 14–26. Oy Gaudeamus Ab, Helsinki.

## 6. HUMAN POTENTIAL AS DRIVER OF HUMANKIND'S DEVELOPMENT

**Laura Pouru**

*Humankind is composed of humans and cannot be better than these humans. The only way to move forward is to improve the skills and abilities of humans. What we need to do now is improve people's creative abilities more than our material environment: it's imperative to elicit understanding, imagination, creativity, innovation in the billions of people who still lack opportunities for development. The biggest threat to humankind resides in humans themselves, and only humans can develop themselves.<sup>87</sup>*

Third recurring research theme for Pentti Malaska from the 1980s onwards was the transition of our society from one determined by materialistic human needs into one determined by needs for spiritual and social interaction. Satisfying these needs, Pentti thought, would be the very foundation for the economy and society. The cornerstone of this new stage of society, for Pentti, was to put human capital to comprehensive use via a universal basic income and civic activism, for example. He called for the introduction of a basic income as a way of maximizing the human potential in a society which no longer had enough work to go around for everyone. Pentti also believed that major changes in society grew out of mass grassroots mobilization rather than reforms imposed by the state and political leadership. He believed in people's capacity for spiritual and intellectual growth and in their ability to become more aware of their planetary responsibility.

---

<sup>87</sup> Pentti's interview. Suomen kuvalehti (48/1982) Rooman klubi uskoo kehittyvän tiedonvälityksen tuovan uutta toivoa ihmiskunnalle. [Club of Rome believes advances in data communications will bring new hope to humankind.]



## Towards a society of intangible needs

*We're living in the interim between two more established stages of development, receding industrial society and emerging service society. The transition started a couple of decades ago and is set to continue for the same amount of time again. This transitional period requires a different kind of decision-making and rationality than either of the two more established periods. People today feel very much at a loss in the face of the unexpected events and changes happening around them. But they've just got to get used to it because this transition is no brief cyclical spike in the bubble economy. It involves an unprecedented spirit of competition and a narrow-minded pursuit of self-interest.<sup>88</sup>*

One of Pentti Malaska's central research themes concerned the process of social change, which he described using a model of social transformation dynamics (Figure 12). The model is based on the idea that society's functions, the shape they assume is largely determined by the needs of humankind. In other words, the stages in the development of human society are determined not by modes of technological production, but by the needs addressed and satisfied by that production. At every stage of social development, a key socio-economic issue has to do with organizing the production and consumption that is necessary in order to meet these needs.

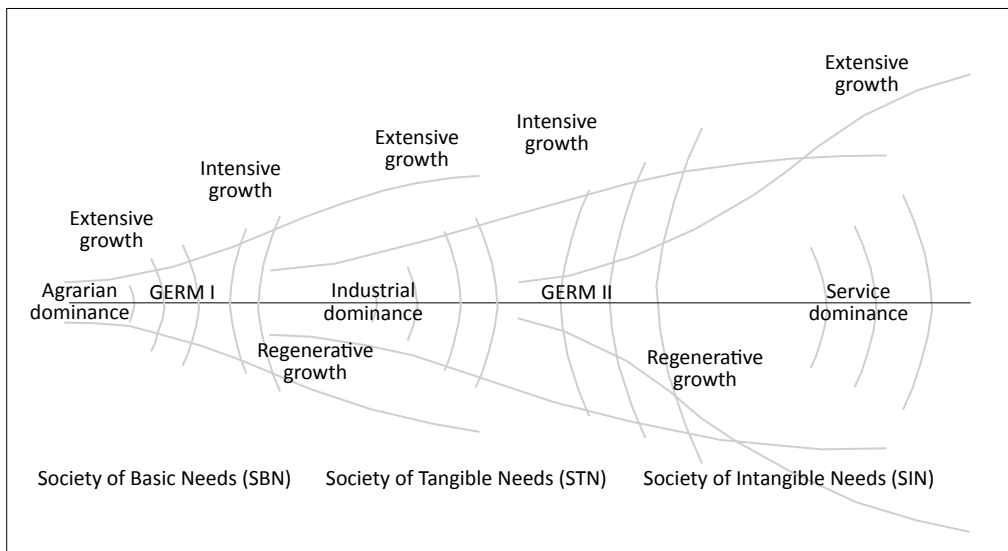


Figure 12. Model of social transformation dynamics.<sup>89</sup>

<sup>88</sup> Pentti's interview. Anjalankosken Sanomat 7.8.2003 Murroskauden ihminen – ekyksissä uuden edessä. [Humans of a transitional age – lost in the face of what's new.]

<sup>89</sup> Malaska, P. (1999) A Conceptual Framework for the Autopoietic Transformation of Societies. FUTU-publication 5/99. Futures Research Centre. Turku School of Economics and Business Administration. Turku.

In the first stage of society, the main focus is on people's most fundamental needs, such as food, shelter and clothing. At this stage, society is built around the satisfaction of these basic needs. At the next stage, these needs are superseded by tangible needs, and society is restructured with a view to meeting those needs. Eventually tangible needs give way to intangible needs; and again society reorients itself to meeting these needs. All these needs have co-existed over time, but it is possible for one of them to temporarily gain relative dominance over others. During this time decisive progress is made in the satisfaction of this need.

So rather than the traditional concepts of agrarian, industrial and information society, Pentti Malaska's model of social transformation dynamics uses a classification based on the needs that society's dominant sector of production is geared to satisfying (basic needs, tangible needs, intangible needs). Pentti's choice of term for the last stage – the society of intangible needs – was based on its focus on humans' needs for interaction that cannot be satisfied by means of industrially produced goods. Pentti also called this new stage of society a service society, as he believed that the meaning of work at this stage will mainly come from human interaction, from the provision of services for the well-being of others. This is how Pentti explains the process of social change:

*Agrarian society satisfied basic needs, industrial society has satisfied tangible needs. It's now becoming ever clearer that people have needs that are not satisfiable by goods. These are the needs for social situations, encounters, conversations, human relations, human contact. These needs can only be satisfied in the presence of another person. Agriculture has not disappeared in industrial society, but it has become unproblematic. In the same way industry will not disappear in interaction society, but it will require ever less input and effort.*

*We will consume huge volumes of human relations, and good ones they will be too! And we will learn how to produce them. This is not simple. The transition will require mental flexibility, and problems will arise from people having many fears, a poor self-esteem, experiences of rejection, jealousy. I expect that a new type of family will also evolve, a community of people who live together even if a couple relationship within the community has outlived its capacity for reproduction.*

*So are humans capable of changing? They certainly are. Just compare the situation today with agrarian society, where children worked in the fields rather than lazing around at school. This is the kind of world I would like to build in the future.<sup>90</sup>*

---

<sup>90</sup> Turun Sanomat 28.8.1983 Tavaroiden sijasta tulemme kuluttamaan ihmissuhteita. [Instead of goods, we will consume human relations.]

Although Pentti regarded intangible society as the logical next step in social development, he did not assume this was the direction in which society would necessarily or automatically evolve. Rather, development towards an intangible society required a determined and active effort.

*I'm not assuming here that societies will automatically follow some predetermined pattern in their development. Intangible society is just one utopia that will happen if a sufficient number of people begin to make it happen. If things continue to go as they are going right now, it definitely will not happen.*

*Not everyone wants change. The people who now hold power and control over goods production see change as a threat because in intangible society, they would no longer be the force in power, driving development.*

*This is why value change does not start from industry, but from somewhere entirely different. One example of this value debate that is now under way is provided by ongoing discussions about nuclear power.<sup>91</sup>*

Pentti regarded information society as a preliminary stage of the society of intangible needs. In other words, information society was just a late-industrial transitional stage in-between two more established periods of development, that is, industrial society and intangible society (Figure 13).

---

<sup>91</sup> Länsi-Savo 13.12.1987 Vuonna 2057 suomalaisten hyvinvoinnin takaa vuorovaikutusyhdistyskunta. [In 2057, society of intangible needs will guarantee the well-being of Finnish people.]

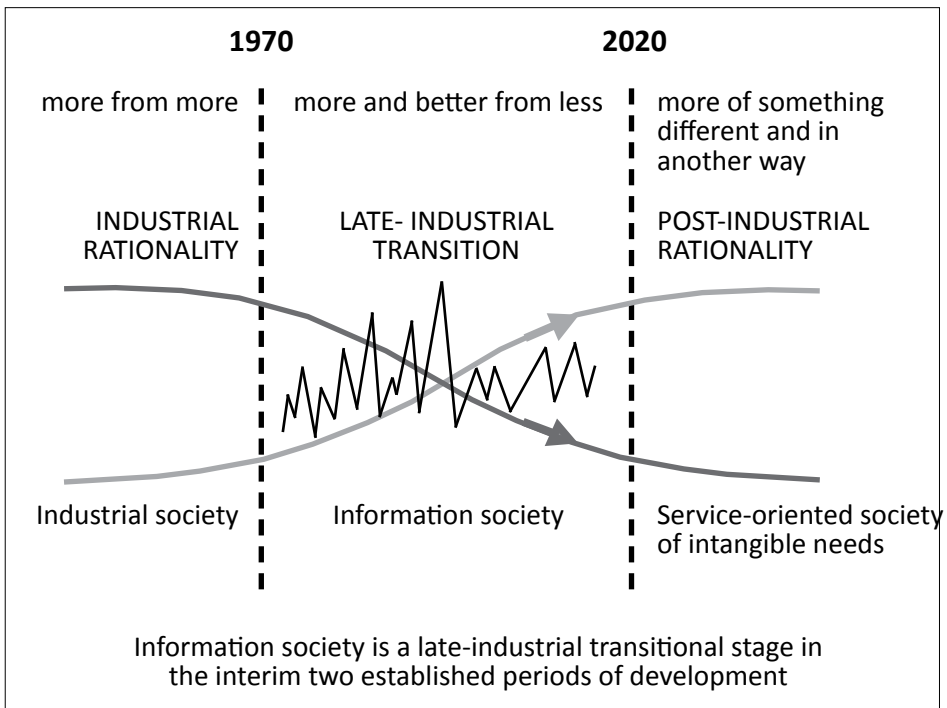


Figure 13. Development from industrial society to intangible society.<sup>92</sup>

Pentti also stressed the importance of recognizing information technology as the infrastructure for the new stage of society (as roads and bridges are the infrastructure for industrial society) rather than an extension of human beings. If this is not understood, Pentti said in several interviews in the late 1980s that current developments would lead us towards a ‘nightmarish information society’.

*Service society also needs an infrastructure that can support and facilitate it. That infrastructure is already well under construction on the basis of information technology. Passive information technology is increasingly becoming a form of awareness technology.*<sup>93</sup>

*Despite information technology, it's not justified to call the next stage of society an information society, any more than we should call the current stage a crane society or jet engine society. The purpose of each stage of society is to address and satisfy some specific need. Technology is just a means to that end – and so it is with information technology in a society of intangible needs, in the same way as agriculture and industry were means in the society of basic needs and the society of tangible needs. However, I*

<sup>92</sup> Malaska, P. (1996) Luentoaineistoa. [Lecture materials.]

<sup>93</sup> Anjalankosken Sanomat 7.8.2003 Murroskauden ihminen – eksyksissä uuden edessä. [Humans of a transitional age – lost in the face of what's new.]

would argue that both a needs-driven and a technology-driven analysis now point in the same direction: they point towards needs that can only be satisfied in human relations, together with other people in the workplace, at school, in the family and other small communities – hence the term ‘society of intangible needs’. If it were not essential to come together with other people in the event of production and consumption, there would be no need for a stage of development shift in the first place.<sup>94</sup>

Pentti believed that the society of intangible needs would also challenge industrial society’s prevailing model of nuclear family. He thought that families and family-like communities which looked after each other in the society of intangible needs would grow larger. He felt people still had much to learn about human relationships, maintaining relationships and solving human relations problems.

*In the society of intangible needs it will also be possible to create material and social conditions for new family forms, which will increase and diversify. The hallmark of the society of basic needs was the extended family, which guaranteed the availability of labour power for the production of basic needs. In today’s society of tangible needs, the aim is still to maximize consumption, and that is best guaranteed by the nuclear family and the truncated family. These are the vehicles for constantly increasing consumption as much as possible. In the society of intangible needs, by contrast, the family provides care and human relations to its members. Rather than the truncated family, this need is better met by the extended family, whose members do not necessarily have to be biologically related. All this would be conducive to citizens engaging in creative activity, which in fact is the only true path of development ahead, no matter how idealistic it might seem. Creative activity and constant development cannot happen in the kind of totalitarian communities described by Pentti Linkola where individuals are held back and shackled, but only in free societies with open systems of governance.<sup>95</sup>*

*Another visible and indeed desirable difference is that there will be changes to the family institution. The extended family of peasant society was not suited to industrial society, but it fell apart. The current nuclear family and truncated family was born. The family model of communication society might not be a community built around a couple relationship, but a community built around group relations. A new extended family is created where what matters most are good human relations and positive interaction among individuals. Couple relationships would be shorter-lived in the extended family than the community itself.<sup>96</sup>*

<sup>94</sup> Länsi-Savo 13.12.1987 Vuonna 2057 suomalaisten hyvinvoinnin takaa vuorovaikutusyhteiskunta. [In 2057, society of intangible needs will guarantee the well-being of Finnish people.]

<sup>95</sup> Länsi-Savo 13.12.1987 Vuonna 2057 suomalaisten hyvinvoinnin takaa vuorovaikutusyhteiskunta. [In 2057, society of intangible needs will guarantee the well-being of Finnish people.]

<sup>96</sup> Pellervo (3/1983) Vielä on syytä elää. [There’s still reason to live.]

## Universal basic income: the foundation for creative society

*As far as the unemployed and unemployment are concerned I think there's been a huge oversight in the sense that the state has assumed the role of provider and thought it has so fully dispensed its duty. The ranks of the unemployed should have been stimulated to work in civic organizations, to get them to work together to create something new. The mistake stems from the false conception that unemployment is just an economic phenomenon rather than a social and cultural one. Social marginalization and mental degradation have been allowed to develop unhindered. It is society's duty to help these people so that they could fulfil their human potential even when they are out of work. For too many people, this isn't happening.<sup>97</sup>*

Pentti Malaska believed that the development of a society of intangible needs would profoundly impact the nature and our perception of work. He believed that this society needed an entirely new way of organizing work that would pave the way to a flexible and creative society and encourage greater activity in people. One important means for achieving this, Pentti argued, was a universal basic income. He was critical of society's view that unemployment was a purely economic phenomenon, and he thought that a basic income would be an important way of harnessing the human capital of the unemployed for the betterment of society.

Pentti believed that a universal basic income would be the best way to maintain society and individuals at a stage of society where technological development was robbing more and more people of their jobs. Pentti realized that in this situation, work can no longer provide the basis for life because there simply is not enough work to go around. In the 1970s and 1980s Pentti actively commented on ways of combatting unemployment caused by automation. The following text is an excerpt from a column Pentti wrote in 1984 for *Sosiaalivakuutus*<sup>98</sup>, a magazine aimed at professionals in the social welfare and health sectors:

*However, the primacy of human relations requires a different kind of society than we have today. Is it realistically possible to materialize a society where need satisfaction is primarily focused on human relations needs? Do we have the material conditions in place to make such a society happen?*

*From a general subsistence standpoint I imagine that this would require a universal basic income system. In fact basic civic income already accounts for a considerable share of people's overall income. Pensioners receive their income in the form of a basic income, as do the unemployed, schoolchildren and people with illnesses. The only problem or*

<sup>97</sup> Pentti's interview. Tietoyhteiskuntafoorum (2/1997) Hypersykli verkostoissa työkaluksi hyvään elämään. [Network hypercycle provides tool for the good life.]

<sup>98</sup> *Sosiaalivakuutus* (1/1984) Arvoista, työstä ja toimeentulosta tulevaisuudessa. [On values, work and income in the future.]

*curious feature is that a universal income is paid to the passive population, but the active population is excluded. Although of course machines can do the job or produce the equivalent output even for the active population! Why are different people treated in such an unsolidary way? Everyone should and everyone could get a basic income, say 100 marks a month after tax. Anyone who so wishes could remain in the rat race to earn more. This change in the dual income system would at once mark the change of the century in balancing income security between men and women and most importantly would release the creativity of citizens and so provide a basis for movements and policies of reform.*

*Closely related to the above, one of the most important values in need of revision is the concept of labour. Today, we mainly understand labour as referring to work that is done in goods production. This is the prevailing understanding of what is meant by productive activity. The production and distribution of goods to consumers is real proper work for which people can still demand and expect payment. Nothing else really counts, to the extent that it can always be asked whether this or that job really needs to be remunerated. Farmers, for instance, no longer actually receive payment for the labour that is involved in growing crops. It's all based on subsidies, the farmer himself is in fact paid a basic income. The values of agrarian society would certainly be different because there, the labour done in the fields was real hard work, as were the jobs that were done in cattle shelters and in the woods. By contrast in industry, which started out as a service industry for agriculture, the jobs were such that the guardians of values, i.e. farmers might well have questioned whether they were proper work at all.*

*Values turned around when the dominant mode of production shifted from agriculture to industry. The values of industry, its requirements for efficiency and diversification, are currently the value of values. The first step is to dispense with this value dependence.*

*It is fair to assume then that as development advances, 'real work' will no longer be understood primarily in terms of jobs done in goods production. Just as work done in the fields no longer counts as real work. Of course, all former types of work will remain necessary jobs that must provide a proper standard of living, in the form of a universal basic income, for the people engaged in these jobs. But the biggest problems of society, the problems whose solution will help society move forward in its development, will lie elsewhere. Goods production will become unproblematic in the same way as agriculture has become unproblematic. In industrial societies today, we have no problem producing as much food as we want in agriculture. It has ceased being a problem. The problem is what to do with the quantities that are produced. The same can be expected to happen in industry: industry will become unproblematic and produce goods in endless abundance. This will inevitably change the concept of work, and it is changing already. We're searching for a new concept of work to replace the old one.*

*Those who are now being made redundant from goods production are far from being useless members of society, in fact they should be seen as renewers. We should make our very best people redundant and get them to work to renew our society. The ultimate purpose of automation is to set people free from jobs in goods production, and now that it's doing this we're wondering what on earth is happening. What's happening is exactly what's supposed to happen.*

During and after the 1990s recession, too, Pentti actively commented on national efforts to combat unemployment. He felt that the competitiveness of Finnish businesses and the well-being of Finnish people were on two diverging paths. The following is an excerpt from a visiting expert's article by Pentti in Helsingin Sanomat in 1995<sup>99</sup>:

*When a business returns a profit, that's obviously good news for shareholders, corporate management and many subcontractors and employees. But success is not necessarily good news for every unit of the company and every employee. While some will see an increase in the market value of their labour, the labour of others will no longer produce the necessary value added.*

*It is impossible, then, to draw inferences from the success of companies about the future success of Finnish people in Finland. The success of companies and the success of the nation are no longer one and the same thing. Companies are less committed than before to promoting the well-being of Finnish people. Nor is the welfare produced equally distributed, in the way it used to be. A good indication was provided by the recent wage negotiations in export industries.*

*This is a new element in the employment problem that has not received attention in political decision-making. Business managers can be enjoying greater success than before in the world marketplace, yet at the same time the relative competitiveness of Finnish employees may be severely dented. The Finnish people whose labour and achievements in the world market continue to enjoy appreciation will do better in their wage negotiations in Finland than those whose labour is not respected by the market forces.*

*Based on the above it is clear that assurance of employment through competitiveness can no longer mean the same as it used to. Employment can only be based on how much the world's effective purchasing power demand will purchase services produced in Finland and what prices they command. Value added accumulates above all from the service value chain and not just from the manufacture of goods. Maximum employment can only be achieved through management of the service value chain.*

---

<sup>99</sup> Helsingin Sanomat 25.1.1995 Kilpailukyky – ratkaisu vai ongelma? [Competitiveness – a solution or the problem?]



*The key to competitiveness lies in new technology and service productivity. But both of these also create quantitative and structural unemployment. Competitiveness becomes part of the unemployment problem.*

*In global terms the magnitude of the unemployment problem over the next decade amounts to around one thousand million new jobs. Tackling the problem via economic growth will create ever-worsening environmental problems. These are signs of a profound transition concerning the world community as a whole, and economic competitiveness alone cannot provide the solution.*

*The right to work, income and a life of human dignity must be redefined in a way that reflects the opportunities offered by scientific and technological development, but that also takes account of social justice and the environmental problems created by economic growth.*

## **Civic activism – a universal duty**

*Ultimately I pin my hopes on civic movements. When people begin to feel the supremacy of the economy is intolerable, a cultural counterforce will arise.<sup>100</sup>*

Pentti believed in the power of individuals to affect change for a better future. He believed that major changes grew out of shifts in people's way of thinking rather than out of the ability of the state political leadership to impose revolutionary changes. He believed that people would begin to call for change once they realized just how catastrophic a future our current development was leading us towards.

*We've now exited the planning era when the thinking was that a group of people specifically assigned to the task of planning could prepare a plan for others then to implement. The way we need to see the future is that we're all, every one of us involved in building the future. That means we'd no longer be asking who drew up the plan that we're trying to implement, but in how this building effort can be completed – through civic movements, small groups or on the grassroots level. Civic movement for the benefit of the future is important. Expression of opinion should be a basic civic skill, something that should be taught as part of the school curriculum. All citizens should know how to establish movements and work in them and know how to organize demonstrations.<sup>101</sup>*

*Civic movements are phenomena of this communication society. Their frequency should be the measure of how good our society is. The more civic movements, the better; they*

<sup>100</sup> Pentti's interview. Suomen kiinteistölehti (3/2000) Kansalaisliikkeet vastapainoksi – Businessvaltio jyrää. [Business state goes from strength to strength – Civic movements to provide counterbalance.]

<sup>101</sup> Suomen Sosiaalidemokraatti 6.7.1984 Rooman klubi tulee Helsinkiin – Luonto ei kestä kertakäyttöä. [Club of Rome coming to Helsinki – Nature can't cope with throwaway culture.]

*are one crucial part of regenerative growth. Politics, business... they're all organized activity that has assumed a specific form. They are like plants with a certain shape and certain mode. But civic movements are the soil from which they grow. The death of civic movements means the soil is so poor that soon nothing will grow in it. For this reason organized forms must be mowed down if needs be and the soil fertilized if things are not looking good. Civic movements can then organize themselves, as for instance the Green Party did. This has often happened with civic movements. There has always been a tendency for problems to accumulate if civic movements haven't managed to get to work. When popular mobilization gets under way, so too will restructuring and regeneration.<sup>102</sup>*

Pentti worked on developing a chemistry-inspired theory of societal hypercycles consisting of humans and organizations:

*In chemistry, a hypercycle is a reaction which has an extremely high resistance to environmental pressure, which grows with great efficiency, which produces other hypercycles. Clones itself. In society, too, there can exist hypercycles formed by humans and organizations, good ones or bad. Hitler caused a strong hypercycle, in a bad sense.*

*Networks and knowledge are key to the development of a hypercycle. Knowledge spreads via networks, and knowledge in turn works like an enzyme. In a chemical hypercycle, enzymes serve as transmitters. They are not consumed in the reaction, they perform their role and move on to the next process. They help create a lasting bond. Knowledge is not consumed either, but it produces ever more knowledge for generous distribution. Bonds and alliances are strengthened, new hypercycles are created and positive things move forward.*

*But hypercycles cannot be brought about by administrative orders or by big money. They grow out of lively interaction, civic activity, openness, knowledge and the open sharing of knowledge. Networks are the infrastructure of hypercycles, for it is in and through networks that knowledge is channelled. However hypercycles of humans and societies do not develop of their own accord, they must be consciously created and the infrastructure they require – information society – must be built and maintained. Their driving forces come from human collaboration.*

*In chemical and biological nature, the hypercycle is set in motion from the only direction that existed: from below. Humans should apply this same model. People should in groups and teams discover creative interaction amongst themselves.<sup>103</sup>*

---

<sup>102</sup> Pellervo (3/1983) Vielä on syytä elää. [There's still reason to live.]

<sup>103</sup> Tietoyhteiskuntafoorum (2/1997) Hypersykli verkostoissa työkaluksi hyvään elämään. [Network hypercycle provides tool for the good life.]

Pentti had strong faith in the power of civic movements. He believed that civic activism will come to challenge the traditional political state and the developing business state.

*Nation-states may disappear and be replaced by business-states, or networks of global corporations that will assume the rights and roles that used to belong to the state. Other basic components of the new kind of state include civic organizations, whose role is bound to increase. If civic organizations were to discover and adopt the hypercycle idea, network themselves and so reinforce one another, they could assume more demanding roles in society. Borders between states mean nothing, but organization-states could operate globally, just as business-states. The nation-state would be reduced to a kind of nuclear state as a 'third estate'.*

*The growing role of civic organizations presents a threat to political life and political party parliament as we know it. A trial of strength between the political party state and nation-state will be played out possibly in the not too distant future. It might even happen with the next proposal to build a nuclear power plant or some other value choice that divides people. When civic organizations are globally networked and form good hypercycles, party discipline or political groups will no longer have power. Parties are standing in the way of hypercycles because they are afraid they will see their own significance dwindle.<sup>104</sup>*

*The political state is disintegrating. It is breaking down into, first, a business-state; second, state communities that are expanding through integration and growing nationally thinner; and third, cross-border and local civil societies. Business-states are supranational agglomerations of business corporations and their communities. They determine such things as the flows of capital and whether and which research projects will be pursued. They are already highly advanced and have assumed many state rights and perhaps some responsibility for the staff's interests, for instance, although still rather modestly compared with their rights. Civil society is a real opportunity, a counterweight to the business-state. The state should support and invest in the business-state, but that is problematic because it further undermines the power of politicians. However it is encouraging that many societies are now showing signs of moving in the direction of local and even international civil societies.<sup>105</sup>*

## **Revolution of consciousness**

*The rise of ethical values as a conscious basis for action and decision-making is the very definition of becoming human and as such a condition for the survival of humankind.*

<sup>104</sup> Tietoyhteiskuntafoorum (2/1997) Hypersykli verkostoissa työkaluksi hyvään elämään. [Network hypercycle provides tool for the good life.]

<sup>105</sup> Suomen kuvalehti 3.9.1999 (article title unknown).

*Yet this is still just a possibility within humans, not a necessity. We can well choose the path of being a robotized human being, of just becoming as efficient and rational as possible. A robot is a rational being. Are we going to make robots the model for humans and humans the image of robots? Being a producer and consumer takes nothing more than that.*<sup>106</sup>

Pentti Malaska urged humankind towards an ethical self-awareness, to recognize and embrace its responsibility for nature and future generations. He thought it was the duty of humans to assume responsibility for the state of the planet because we have an exceptional level of consciousness to understand the continuity of generations. Pentti believed that the solution for a better future was to be found in the development of an ever higher level of consciousness in humans.

*Humans are responsible for ensuring that their existence becomes a sustainable and valuable part of life and that the totality of life in which they are involved is in some sense better and richer than life without humans. I think this can be regarded a fundamental premise for ecohumanism.*<sup>107</sup>

*This generation can make life for itself so fantastic that there's never been and never will be anything like it. If we only pursue what we're going to experience during our own lifetime, then we're heading in the wrong direction. A good life is one that the next generations coming after us can also consider to be good.*<sup>108</sup>

*Humans need protection against themselves. The world and its natural environment, by contrast, need no protection. They will repair all the destruction caused by humans when humans are no longer. Nature doesn't need us, but we need nature.*<sup>109</sup>

Pentti believed it was possible for humans to increase their wisdom through spiritual development. He said that so far, science and technology had advanced our material and physical well-being, but spiritual and intellectual well-being had received less attention. Pentti was concerned that the importance of human spirituality and culture had been forgotten amidst people's materialistic achievements.

---

<sup>106</sup> Pentti's interview. Hengellinen kuukausilehti (11/1988) Eettisissä arvoissa ja uudessa tiedossa on ihmiskunnan toivo. [Hope of humankind lies in ethical values and new knowledge.]

<sup>107</sup> Malaska, P. (1993) Uusia näkökulmia ympäristöongelmiin ja tekniikan kehittämiseen. [New perspective on environmental problems and the development of technology.] Draft. Turun kaupakorkeakoulu, Turku.

<sup>108</sup> Kotiliesi 7.9.1990 Tavallisen ihmisen ei tarvitse pelätä lamaa. [No need for ordinary people to fear the recession.]

<sup>109</sup> Apu 17.1.1992 Rooman klubin suomalaisjäsen Pentti Malaska: Vaadimme vallankumousta. [Pentti Malaska, Finnish Club of Rome member: we're calling for a revolution.]

*Some estimates suggest that roughly half of all people are in need of psychotherapy. Perhaps everyone needs a form therapy to improve their consciousness. This would help people see their own mistakes and their frenzy of destruction, but also to develop their strengths.*<sup>110</sup>

*Culture is important, it can provide spirituality. In the modern western world everything revolves around the narcissistic individual, and society is something where people go to plunder.*<sup>111</sup>

*The cultural forces of an increasingly internationalized and Europeanized Finland are the carrier wave whose capacity for regeneration and creative power will determine our tomorrow and the future of our youths. Culture carries over millennia, while fiscal conditions vary and opportunities come and go very quickly.*<sup>112</sup>

Pentti believed that humans were separated from information technology and robots by consciousness and ethical values. He respected the creativity and complexity of humans and the mysteries of the human mind. He thought that as long as there were human mysteries to be resolved, there was also reason for humanity to live. Pentti believed that once humans were exhaustively understood, they could be built as machines, just as all other phenomena that were exhaustively understood.

*Other thinkers believe there is nothing unique about humans, nothing distinctive compared to machines, some of which might not yet have been invented. Humans are just a machine among others, and not even a particularly impressive image of a robot in view of the future potential of technology. Human-made non-humans, that's the answer of technology to the path of humankind's development. Organic humans will be replaced by more capable and talented high-tech species who we will get started ourselves.*<sup>113</sup>

*Rather than human creativity, there's wide-eyed adulation of computers. How clever they are, how wise and capable! We need to put things in proportion. Computers are products of processing sand. The basic components of computers are made of silicon, which occurs naturally in sand. It's made of ordinary sand from the beach. Integrated circuits made of silicon chips are the magical components of computers. The first integrated circuit was sandpaper. It was made by gluing together grains of sand. It certainly became a useful tool, but no one admired it to the extent that we now admire com-*

---

<sup>110</sup> Kotiliesi 7.9.1990 Tavallisen ihmisen ei tarvitse pelätä lamaa. [No need for ordinary people to fear the recession.]

<sup>111</sup> Turun Sanomat 8.9.1996 Henri Bromsin ja Pentti Malaskan materialismin kritiikki. [Henri Broms and Pentti Malaska critique materialism.]

<sup>112</sup> Keski-suomalainen 23.1.1994 Suomalaisuuden harharetket. [Odysseys of Finnish identity.]

<sup>113</sup> Elonkehä (5/2004) Pentti Malaska kysyy poistaako tekniikka etiikan? [Pentti Malaska: does technology render ethics unnecessary?]

*puters. We admire computers instead of the creativity that's in our mind. We don't yet integrate brains. Every individual works alone in isolation. People should get together to form brain circuits. That is how they could bring out their creativity to use and create something that no one can create on their own.*<sup>114</sup>

Pentti believed that the survival of humankind on planet earth ultimately depended on ourselves. We have driven our planet and humankind as a whole to the brink of disaster through our own actions, by causing most of our current and future problems. He believed that the future of humankind now depended on our ability to make conscious and responsible choices.

*It's obvious that it is not only humans who have to adapt to nature, but nature has to adapt as well by adjusting its own functions. For humans, this means we must increasingly prepare for the irreversible changes we have caused ourselves, both in the environment and in the circumstances of our life.*

*The problem is not just maintaining balance in nature, which may never have existed in the first place, but mutual adaptation to the necessary and incessant changes that are happening. Sustainable development, if such a thing exists, cannot be based on maintaining balance in nature. There is no balance in nature, other than perhaps in the interaction between earth and space, and on the earth nature is in a constant change of flux, and humans are changing this process of change.*

*The question we must ask then is how far and by what means will the capacities and possibilities of humans suffice in this process of mutual adaptation, and in what way will human technology and the technosystem created by humans contribute to our co-existence with nature, or become an obstacle to human adaptation. One thing we know for sure: nature will always manage, no matter what humans do, humans do not have the power to destroy all life. The key issue from the human standpoint is which will 'win', life with and in partnership with humans, or life without humans.*

*The burden of proof in this matter lies with humans themselves. We should be able to demonstrate that life as humans is valuable and a sustainable part of life in a broader sense. If humans had not achieved consciousness, if life in humans had not become conscious of itself, this fact would have no meaning to us, nor indeed to anything else. In this sense the value of life and the pursuit of sustainable development is a profoundly human experience and a spiritual endeavour.*<sup>115</sup>

---

<sup>114</sup> Turun Sanomat 10.10.1987 Ihmissuhteet ja luovuus kunniaan. [Celebrating human relations and creativity.]

<sup>115</sup> Malaska, P. (1993) Uusia näkökulmia ympäristöongelmiin ja tekniikan kehittämiseen. [New perspective on environmental problems and the development of technology.] Draft. Turun kauppakorkeakoulu, Turku.



© Kimmo Ojaniemi

PENTTI MALASKA'S  
RESEARCH AREAS  
AND RESEARCH METHODS



## 7. PLANETARY MODELLING AND ENERGY RESEARCH

## Planetary consciousness and planetary statistics

**Karin Holstius**

*Humans don't yet have a planetary consciousness. Without it, nothing will change. One horrifying example is provided by climate change. Recycling is not the only necessary solution. We need planetary technology that is compatible with sustainable development in other senses, too. Our next mission is to create that technology – and at once to dispense with this hegemonically one-sided economic thought model. Humankind has absolutely no idea how the planet works as a system and how we should actually go about our existence here.*<sup>116</sup>

In a lecture he gave on planetary statistics on 4 March 2010 and an article based on this lecture<sup>117</sup>, Pentti said that he had been dwelling on this research theme for the best part of 40 years and that he hoped it would generate some interest. He stressed that the theme had been quite extensively covered under different names by other scholars as well as in the public debate and discussion – but that today, it was more topical and more important than ever before.

Pentti started off by referring to Rachel Carson's book *Silent Spring* (1962) and to *The Limits to Growth* report commissioned by the Club of Rome (1972): these two works, he said, had been wake-up calls for all of living nature on the planet. He was compelled to acknowledge, however, that despite extensive debate and some cautious efforts, there had still been no definitive turnaround. He also said that technology was still not developing fast enough, and that economic growth continues to happen largely at the expense of the quality of the environment and genuine well-being. Furthermore, Pentti stressed that efforts had to be stepped up to integrate the perspectives of the economy, environment, society and technology into a holistic system of planetary information. The recent international trends of beyond-GDP measurements of development, for Pentti, were little more than extensions of the wake-up calls of the 1960s and 1970s. The real challenge for international statistics, he maintained, was to develop a genuine planetary information system. Pentti called this new need for information and knowledge a 'planetary perspective'; and its implementation 'planetary statistics'.

Pentti also referred in his article to a graph he had published as early as 1994<sup>118</sup>.

<sup>116</sup> Tammenlastuja (1/2009) Pentti Malaska – ennalta näkijä, edellä kulkija. [Pentti Malaska – A visionary and forerunner.]

<sup>117</sup> Malaska, P. (2010) *Planetaarinen tilastotoimi*. [Planetary statistics.] Suomen tilastoseuran vuosikirja 2010. Helsinki. p. 116–132

<sup>118</sup> Malaska, P. (1994) Progress, nature and technology in late modern transition. *Futures*, Vol. 26 (5), 529–541.

It described the ‘human spiral’ within the energy cycles of nature and provided a basis for his deliberations on the planetary might of humans (Fig. 14).

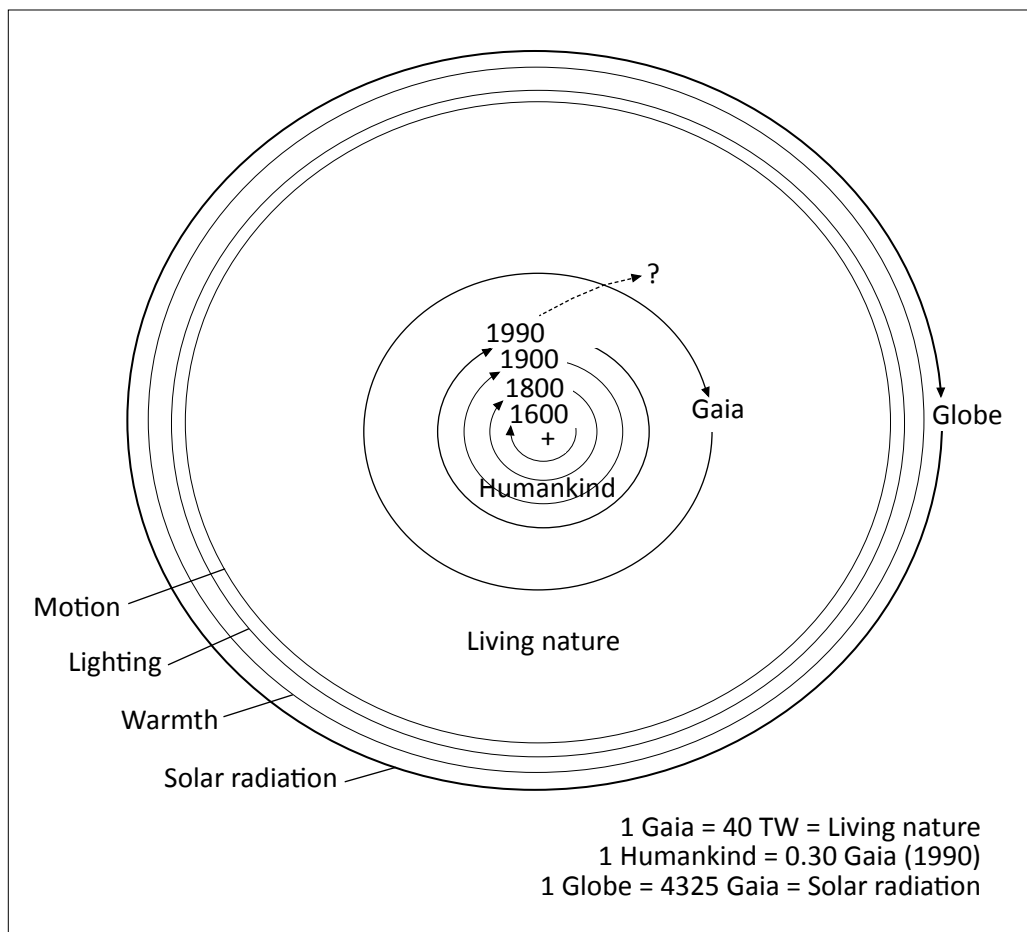


Figure 14. Human spiral within the energy cycles of nature.<sup>119</sup>

This is how Pentti explained the graph:

‘The outermost cycle represents the influx of solar radiation to Earth. The next three cycles represent how much of this energy is used on Earth for the three main planetary functions: heating 50%, lighting 30% and transport 20%. At some distance inside these cycles is the energy cycle describing the might of living nature – this cycle accounts for some 1/4,200th of a part of total solar radiation. Inside nature’s energy cycle is the constantly growing technological energy consumption

<sup>119</sup> Malaska, P. (1994) Progress, nature and technology in late modern transition. *Futures*, Vol. 26 (5), 529–541.

by the human species: that is represented by an expanding spiral, comparable to bacterial growth in a petri dish. Today, human energy consumption accounts for around 50% of the total energy consumption of all living resources, but the boldest forecasts already go beyond the energy cycle for living nature.

*Life, the preservation and evolution of life on the planet is the outcome of the diversity and functional efficacy of living nature. Never before has the might of the human species been so great in comparison with the might of living nature. What happens when the part becomes greater than the whole, when the 'systemic roles' of humans and nature are interchanged? During the scientific-technical era the material scale of the human species on the planet has grown to such proportions that it is necessary to consider the global economic and technical system in relation to the planetary situation of nature and life, and not just as a means to reaching people's own goals.'*

Pentti stressed in his lecture that this type of analysis required a planetary information system, not to mention planetary statistics, but also pointed out that the system was still in the making, although some studies and assessments had been done and some models and indicators produced at the Finland Futures Research Centre and elsewhere. He mentioned that in the early 1990s, he had worked with Jyrki Luukkainen and Kari Grönfors to prepare balance sheets for Finland's material and energy flows based on the concept of exergy, but felt that none of their indicators were as yet sophisticated enough to provide a viable alternative to the GDP measure as a tool of political and economic guidance, despite the shortcomings of GDP. However, he did point out that internet-based data mining to obtain information about the planet and human behaviour was now opening up whole new opportunities.

Pentti also examined the economy from a planetary perspective based on the following graph (Fig. 15).

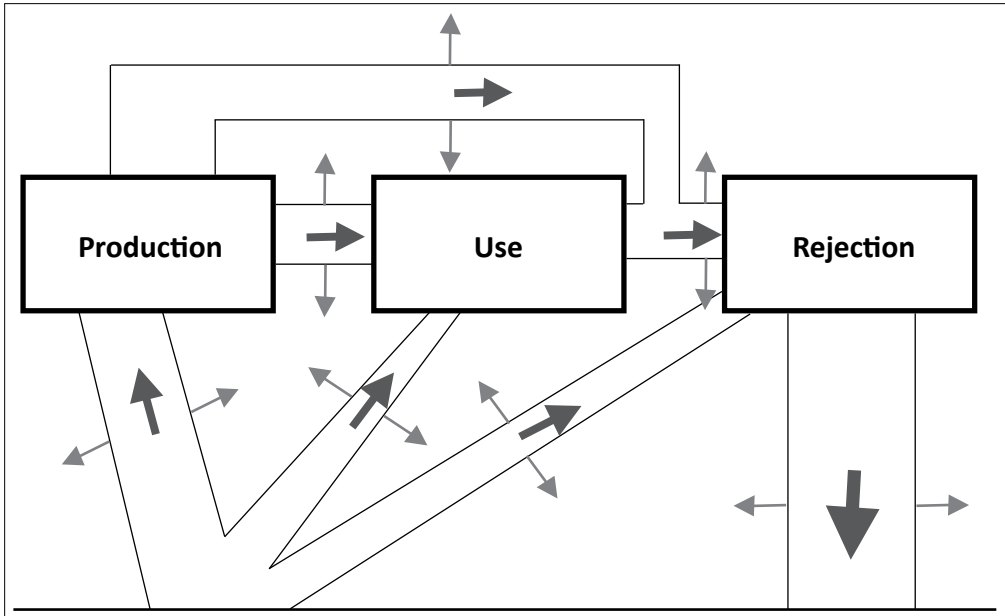


Figure 15. The economy from a planetary perspective.<sup>120</sup>

Pentti used this graph to demonstrate how nature in its entirety – in its functions as well as its structures – is treated in the economic system and consumption as a disposable commodity. The left hand side of the graph depicts natural resources, which are extracted from nature and constantly transformed into built environment, waste and emissions, which consequently take up ever more space in nature, which is represented on the right hand side of the graph. Pentti described the principle of this kind of economic system as the imperative of technological disposable consumption.

In a graph describing human-nature interaction (Fig. 16), Pentti examined a momentary situation as transferred onto a time axis, and showed how constant growth also created a constantly increasing need for natural resources, increasing amounts of waste deposited in nature and increasing amounts of space being claimed from nature, causing the respective curves to converge on each other. At the same time, the amount of natural, pristine space in between these curves was continuing to shrink.

<sup>120</sup> Malaska, P. (2011) Planetaarinen tilastotoimi. [Planetary statistics.] Futura 1/2011.

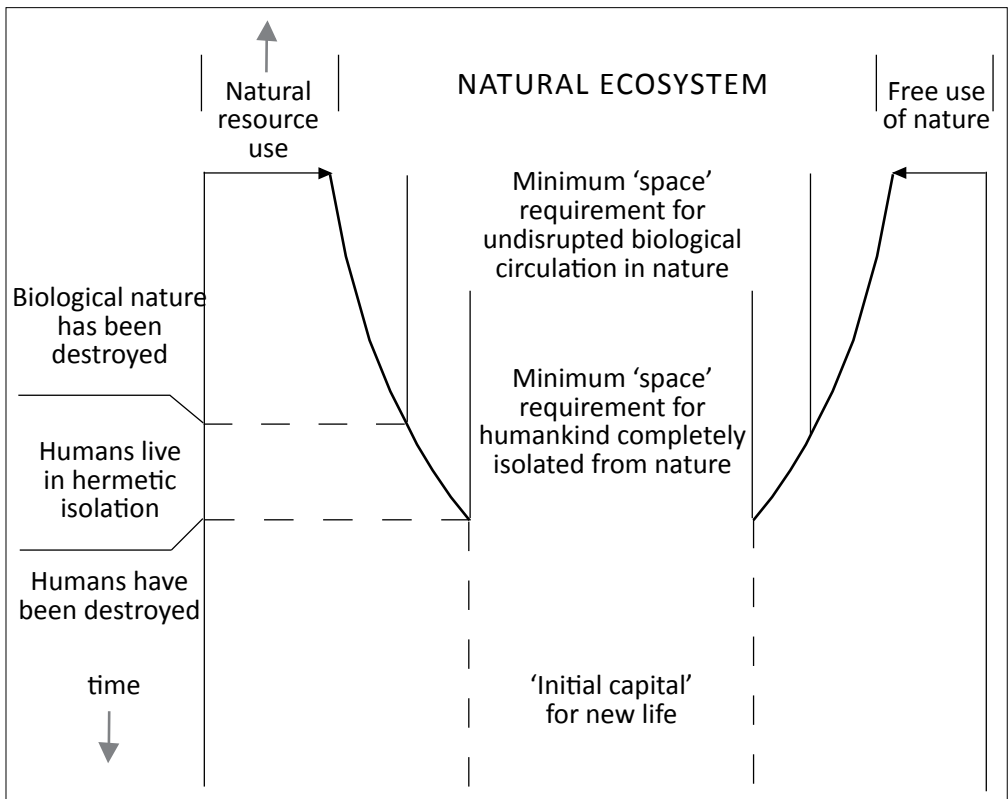


Figure 16. Interaction between humans and nature.<sup>121</sup>

With the escalation of climate change there has been growing recognition of the importance of circular economy, not only in Finland but across the EU. In a radio interview on 22 July 2016, a representative of the Finnish Innovation Fund Sitra said that ‘circular economy is in fact the solution to climate change’ – a view originating from within the EU Commission a couple of years earlier.

In his work on planetary statistics, Pentti also addressed questions concerning Earth’s carrying capacity. He said there was credible evidence to suggest that we might already have exceeded the limits of sustainable resource use and that all we can do is wait and see how nature will kick back. Once nature’s carrying capacity has been exceeded, the situation is out of human control and we will be on the brink of chaos – although possibly not yet within chaos. Pentti also described the work that was being done at the Finland Futures Research Centre to develop an information system for Advanced Sustainability Analysis (ASA). The aim and purpose of ASA is to identify the trends of environmental hazards and sustainable growth policy. The research evidence available, Pentti said, warranted a new kind

<sup>121</sup> Pentti’s interview. Tammenlastuja (1/2009) Pentti Malaska – ennalta näkijä, edellä kulkija. [Pentti Malaska – A visionary and forerunner.]

of growth policy, which he termed a policy of neo-growth. He defined neo-growth as follows:<sup>122</sup>

- dematerialization of production growth, or producing ‘more from less’
- immaterialization of consumption growth, or ‘more well-being and welfare from less tangible consumption’
- lifestyle change: ‘more focus to non-material intensive existence’
- global degrowth policy
- transition from industrial, material-intensive information society to a society of less material-intensive interaction needs and service economy
- development of lacking planetary technology.

---

<sup>122</sup> Malaska, P. (2010) Planetaarinen tilastotoimi. [Planetary statistics.] Suomen tilastoseuran vuosikirja 2010. Helsinki. p. 116–132.

## Exergy and ASA analysis

*Jyrki Luukkanen*

### *Exergy*

One example of the breadth of Pentti Malaska's view on energy issues is provided by his approach to exergy analysis. As is known, the physical law of conservation of energy and matter states that energy cannot be destroyed, only transformed. Pentti stressed that in our various functions in society, we are not in fact consuming energy, but exergy. For this reason it was important to perform an exergy analysis of society.

Put simply, the concept of exergy describes both the quality and quantity of an energy source. Our daily consumption detracts from the quality of energy, in other words the quality of energy deteriorates and is transformed into a state in which it is harder to consume. For instance, electrical energy, which has a high exergy content, can be transformed in full into thermal energy, which has a low exergy content. Thermal energy, on the other hand, can only be converted into electrical energy in part.

In the late 1980s Pentti was running a research project on exergy consumption, with funding from the Ministry of Trade and Industry. A joint effort with Tampere University of Technology, the project was intended to produce an exergy balance for Finland.<sup>123</sup> This was a globally unique undertaking that provided an abundance of new insights for purposes of energy planning. Unfortunately, the Ministry's decision to cut short its funding meant that further studies and work to put the results to practical use had to be abandoned. Nevertheless the exergy analysis provided an excellent foundation for wider deliberations on planetary energy flows and sustainable development. Pentti continued to elaborate on these ideas as he moved on to conduct entropy analyses and to address complexity issues.

### **ASA**

Pentti Malaska was always determined to take as broad and comprehensive a view as possible on the research subjects he addressed. One framework of thought that neatly captures Pentti's approach and way of thinking is Advanced Sustainability Analysis (ASA). ASA involved integrating all three dimensions of sustain-

---

<sup>123</sup> Malaska, P. – Luukkanen, J. – Grönfors, K. & Kantola, I. (1989) Suomen energjakäytön eksergiataseet. [Exergy balance sheets for Finnish energy consumption.] Esitutkimusraportti N:o 120/881/88, Kauppa- ja teollisuusministeriö.



able development (i.e. environment, economy, society) into one and the same computational framework, for simultaneous analysis. A detailed description of ASA is provided in the Encyclopedia of Life Support Systems and Sustainable Development.<sup>124</sup> Over the years it has been used in numerous projects at the Finland Futures Research Centre.<sup>125</sup>

Pentti made a highly significant contribution to developing ASA, and in the process displayed his penetrating power of thought and supreme mastery of mathematical methods. ASA makes it possible to calculate the maximum level of sustainable economic development without exacerbating existing environmental problems; and at the same time to calculate the minimum level of economic development that avoids causing any adverse effects on social conditions. ASA was based in part on the method of decomposition analysis that Pentti developed together with JiWu Sun and other research team members, which involves breaking down changes in the phenomenon under study (e.g. carbon dioxide emissions) by contributing causative factors. Pentti's innovation was to expand this process of decomposition to a simultaneous analysis of all dimensions of sustainable development.

The ASA toolbox also allows for analysing trends in the material intensity of production and consumption; factors impacting on employment and the effects of automation; the capacity of the economy to generate well-being and welfare; and other issues and aspects addressed in the economic policy debate. The computing framework developed by Pentti makes it possible to bring all these various facets under simultaneous analysis and to explore their interactions.

ASA has been used extensively in many Finland Futures Research Centre projects, both for purposes of global comparisons and especially in analyses focused on developing countries. It brings to the fore the holistic way of thinking that underpinned all of Pentti Malaska's scientific work. The framework he developed for the simultaneous analysis of social, environmental and economic processes brought to concrete realization Pentti's tenet that it is important to take a systemic view on phenomena that are often treated as separate and distinct, and that interactions between these phenomena must also be taken into account.

---

<sup>124</sup> Kaivo-oja, J. – Luukkanen J. & Malaska, P. (2001) Advanced Sustainability Analysis. In: Tolba, M. K. (ed.) Our Fragile World. Challenges and Opportunities for Sustainable Development. Encyclopedia of Life Support Systems and Sustainable Development. Vol 2. EOLSS Publishers Co. Ltd, Oxford.

<sup>125</sup> Kaivo-oja, J. – Luukkanen, J. & Malaska, P. (2001) Sustainability Evaluation Frameworks and Alternative Analytical Scenarios of National Economies. Population and Environment. A Journal of Interdisciplinary Studies, Vol. 23 (2), 193–215.

## Energy tax comparisons and practices of energy and environmental policy

*Jarmo Vehmas*

Pentti Malaska was hopeful and optimistic that one day, scientific evidence and research knowledge would contribute to better government policies. On the other hand, he was well aware that powerful interests are at play in all political decision-making, and that, for reasons that have to do with democracy itself, these interests are often dressed up as knowledge. As we have seen above, Pentti was particularly keen to produce a new kind of holistic scientific knowledge that would lead to more informed decision-making.

Energy policy has always been impacted by powerful interests on which Pentti took a critical view. Pentti was committed to the principle that decision-making should always be geared to promoting public interest and objectives in society, which include not only human welfare but also the health and well-being of the environment. Pentti took a sceptical view of all information and knowledge produced by financial interest groups. Indeed, he would often purposely take an opposite view and highlight aspects that those interests groups chose not to mention.

In the field of environmental policy, Pentti was a staunch supporter of economic control, among other things by means of environmental and energy taxation. He considered it paramount that this control properly reflects the burden placed on the environment: the greater that burden, the greater should be the costs, which would have the effect of persuading people to change their behaviour. This 'polluter pays' principle ties in with a joint project we had with Pentti that in its day attracted quite considerable attention.

The world's first carbon dioxide tax, the tax on energy production introduced in Finland in 1990, was in its first years as just and fair as reasonably possible in environmental policy terms. All fossil energy use, including energy generation, was taxed at the same rate. The tax was even levied on imported electricity to ensure it received no preferential treatment. All that was missing was a long-term plan for how to develop the tax regime. Initially the tax rate was very low, but for fiscal reasons it was raised quite sharply in 1993–1995. In response, Teollisuuden Energialiitto (TELI)<sup>126</sup> launched a campaign to highlight the heavy 'energy tax burden' on industry, which it said was paying the 'world's highest energy taxes'. Electricity

---

<sup>126</sup> Teollisuuden Energialiitto (TELI) was an advocacy group for Finnish energy industries in the 1990s.

producers, for their part, pointed out that electricity generation and imported electricity in Finland attracted taxes that were not levied in competing countries. Spokespeople for energy producers Imatran Voima said that coal power plants in Finland were sitting idle at the same time as coal-generated electricity was being imported from Denmark.

In spring 1995 a Ministry of Finance working group on energy taxation came out with a memorandum that quoted energy tax comparisons commissioned by TELI. The Ministry of the Environment had no representation on the working group, and therefore Director-General of the Ministry's Environmental Policy Department Markku Nurmi<sup>127</sup> decided to contact Pentti. They shared the common view that the policy preparation process had been too heavily tilted towards industry interests. As a result, the Ministry of the Environment commissioned the Finland Futures Research Centre, under Pentti Malaska's directorship, to undertake an inquiry whose purpose, as described by Pentti in the preface to the final report, was as follows: 'The aim is to find out whether structures and levels of energy taxation in the Nordic countries in 1996 differ in such a way as to warrant changes to taxation practices in Finland. The report describes the tax regimes applied to energy production and consumption in Finland, Sweden, Norway and Denmark. This is followed by three different comparisons that will help assess the need to revise the Finnish system of environmentally motivated energy taxation primarily from an environmental policy standpoint.'

The report by the Finland Futures Research Centre was published in early 1996. According to the results Finland had the lowest nominal tax rates for energy sources among all the Nordic countries, in virtually all sectors of consumption. The impact of energy taxation on overall electricity acquisition costs and the 'energy tax burden' of the case companies were the lowest under the Finnish tax regime. These findings, and particularly the criticisms levelled against the findings by TELI, attracted much public attention. The critical response by some media, including the public service broadcaster, was journalistically dubious and unprofessional as neither the party that had commissioned the research nor the Finland Futures Research Centre were contacted for comment. Pentti and his team were forced to defend their work by joining the public debate and writing letters to the editor.

As it turned out, the energy tax comparison carried out by the Finland Futures Research Centre had hardly any effect on the outcome of the political decision-making process. Its influence was limited to informing the public debate and discussion and to highlighting the environmental policy viewpoint, which had been

---

<sup>127</sup> Markku Nurmi (1945–2010) served as Director-General of the Environmental Policy Department at the Ministry of the Environment from 1994.

completely ignored in the preparatory process. The report also presented monthly electricity transfer statistics which showed that the electricity imported into Finland in the 1990s was not in fact Danish coal-produced electricity. After the publication of the report Finnish electricity producers stopped making reference to Danish imports. Pentti and his team were invited to present the results of their work to the Parliamentary Commerce Committee and the Environment Committee when they were discussing a government proposal drafted by the Ministry of Finance to overhaul Finnish energy taxation. A few MPs joined forces to draft a legislative motion on energy taxation which placed greater emphasis on the principle of environmental regulation than the government proposal, but this proposal made no headway in parliamentary proceedings. Following the publication of the report compiled by Pentti and his team, factors mainly associated with EU legislation came to light which eventually led to the decision to revise Finnish energy taxation. There is good reason to suggest that these factors might never have surfaced and that the more environmentally conscious legislative motion would never have been prepared had it not been for Pentti's critical social awareness.

## 8. VISIONARY MANAGEMENT

## Pentti Malaska's contributions to developing systems thinking and strategic thinking

*Jari Kaivo-oja*

Pentti Malaska had a long-standing research interest in the management and governance of business companies from a future standpoint. His work in this area may be described as a research programme on visionary management, which included the three component areas of instrumental rationality, goal rationality and value rationality. Closely related to this research interest, Pentti invested considerable effort in developing scenario thinking in organizations.<sup>128</sup>

Predictive business was a natural fit with the broader research interests pursued at the Turku School of Economics, which at the time that Pentti took up his professorship was launching its first efforts in operations research, strategic management studies research and futures research. At the same time, the first steps were being taken towards the long-term development of doctoral training programmes. Scenario thinking and various scenario methods became integrated in futures research via operations research and Delphi methods.

The concept of scenario thinking was first introduced in the context of futures studies by Herman Kahn in the 1950s, while working at Rand Corporation research institutes in the United States. The methods and approaches of operations research were in turn developed in the field of war research and particularly aeronautics and aviation sciences in the 1950s and 1960s, again in the United States. One of the most prominent theorists in this field was Kenneth Arrow, a 1972 Nobel Laureate in Economics. Pentti Malaska was well versed in these mathematical models that had been developed by operations research. In this sense Pentti ranked among the 'OR men'. Delphi methods, for their part, were developed at around the same time within the Rand Corporation, which recruited large numbers of scientists and researchers based on their merits in the war.<sup>129</sup>

In Finland, scenario methods have been developed in various contexts. Under Pentti Malaska's supervision, Tarja Meristö and Mika Mannermaa were particu-

---

<sup>128</sup> Malaska, P. & Mannermaa, M. (1985) *Tulevaisuudentutkimus Suomessa*. [Futures research in Finland.] Gaudeamus, Juva.

<sup>129</sup> Kahn, H. & Wiener, A. J. (1996) *The Next Thirty-Three Years: A Framework for Speculation*. *Daedalus*, Vol. 96 (3), 705–732. The MIT Press on Behalf of American Academy of Arts & Sciences.

Masini, B.E. (1993) *Why Futures Studies?* Grey Seal, London. p. 90.

larly active in this development effort. Malaska and Mannermaa<sup>130</sup> offered the following definition of future scenario: 'A future "script", or a description of chains of events potentially occurring in the future. Scenario refers to a trajectory along which the development of something is represented as a succession of cross-sectional images. The state of the same phenomenon at different points in time constitutes a chain. The cross-sectional situation provides a description of the relationships between different variables at a certain moment in time.' Mannermaa<sup>131</sup> later elaborated on this and said that a scenario is a 'description of events progressing stage by stage, linking the future to the present'. The collaboration between Mika Mannermaa and Pentti Malaska was to prove instrumental to the founding of the Finland Futures Research Centre at the Turku School of Economics in 1992.<sup>132</sup>

Tarja Meristö's (1991) definition of future scenario is presented from a business research standpoint: 'A scenario is a script of the future that sketches the business company's future operating environment(s) (=scene and stage) and the actions taken by the company and its rivals in these environments (=lines and movements on the stage) with a view to achieving their objectives (=how the plot is carried forward).' Mika Mannermaa<sup>133</sup> described the method of building scenarios as follows: 'The scenario method is used to create a logically unfolding series of events whose purpose is to demonstrate how a possible – either probable, desirable or threatening future – gradually evolves from the present state of affairs.' The use of the scenario method leads logically to strategic decision-making being redefined or developed within the organization.<sup>134</sup> Pentti Malaska also applied the scenario method to outlining the challenges of sustainable development and the future of

---

<sup>130</sup> Malaska, P. & Mannermaa, M. (1985) *Tulevaisuudentutkimus Suomessa*. [Futures research in Finland.] Gaudeamus, Juva. p. 292.

<sup>131</sup> Mannermaa, M. (1999) *Tulevaisuuden hallinta. Skenaariot strategiatyöskentelyssä*. [Managing the future. Scenarios in strategy work.] *Ekonomia-sarja*. WSOY, Porvoo. p. 220.

<sup>132</sup> Mannermaa, M. & Malaska, P. (1992) *Innovatiivinen yhteiskuntakehitys ja teknologia. Tulevaisuudentutkimuskeskuksen tutkimusohjelman suunnitelma*. [Innovative social development and technology. Research plan for Finland Futures Research Centre.] *Turun kaupparkeakoulun julkaisuja, Keskustelua ja raportteja 3:1992*. Turku.

<sup>133</sup> Mannermaa, M. (1999) *Tulevaisuuden hallinta. Skenaariot strategiatyöskentelyssä*. [Managing the future. Scenarios in strategy work.] *Ekonomia-sarja*. WSOY, Porvoo. p. 57.

Mannermaa, M. (1991) *Evolutionaarinen tulevaisuudentutkimus*. [Evolutionary futures research.] *Acta Futura Fennica No. 2*. VAPK, Helsinki. p. 145.

<sup>134</sup> Kaivo-oja, J. (2002) *Tulevaisuuden tekeminen strategisen ajattelun valossa*. [Making the future in the light of strategic thinking.] In: Kamppinen, M. – Kuusi, O. & Söderlund, S. (eds.) *Tulevaisuudentutkimus – Perusteet ja sovellutukset*. [Futures research – Foundations and applications.] *Suomalaisen Kirjallisuuden Seuran toimituksia 896*, 224–248. Helsinki.

the Finnish energy system.<sup>135</sup>

Today, the scenario method is an established and integral part of both private and public sector organizations' strategy processes. This can largely be attributed to the exceptional efforts of Pentti Malaska in promoting futures research in Finland and in international contexts. In particular, his scientific work culminated in the development of the model of visionary management, a project on which he worked closely with Ian Wilson, Principal of Wolf Enterprises, and Professor Karin Holstius.<sup>136</sup>

Ian Wilson had a key expert role in developing the strategy and scenario processes of General Electric, one of the world's largest corporations. Pentti and Ian engaged in active e-mail correspondence and were greatly inspired by each other's ideas. There was also a profound sense of mutual collegial respect.<sup>137</sup> Their collaboration in the field of business research was extraordinarily important. I myself also had the privilege of getting to know Ian Wilson, a charming and modest World War II parachute veteran who frequently visited Finland. Professor emerita Karin Holstius is an internationally renowned professor of marketing at the Turku School of Economics, who has continued to the present day to work tirelessly at developing Finnish expertise in the field of marketing and business research. Her contribution to the development of the visionary management model has been irreplaceable. Pentti Malaska and Karin Holstius finalized their joint research project in spring 2003 at the Rockefeller Foundation Centre in Bellagio, Italy.

Among Pentti Malaska's most significant achievements in the area of scenario thinking is his multi-scenario model.<sup>138</sup> Another achievement that deserves separate mention is his mathematical model of futures universes and the idea of a

---

<sup>135</sup> Vehmas, J. – Petäjä, J. – Kaivo-oja, J. & Malaska, P. (1998) Ilmastopolitiikka ja Suomi - kansainvälisiä näkökohtia sekä kansallisia sähköntuotannon ja -kulutuksen skenaarioita. [Climate policy and Finland – international perspectives and national scenarios for electricity production and consumption.] Suomen ympäristö 223. Ympäristöministeriö. Oy Edita Ab, Helsinki.

Kaivo-oja, J. – Luukkanen, J. & Malaska, P. (2001) Sustainability Evaluation Frameworks and Alternative Analytical Scenarios of National Economies. *Population and Environment*, Vol. 23 (2), 193–215.

<sup>136</sup> Malaska, P. & Holstius, K. (1999) Visionary Management. *Foresight*, Vol. 1 (4), 353–361. Holstius, K. & Malaska, P. (2004) *Advanced Strategic Thinking – Visionary Management*. Turun kauppakorkeakoulun julkaisuja, Sarja A-8:2004. Turku.

Malaska, P. & Holstius, K. (2011) *Advanced Strategic Thinking: Visionary Management for Leaders*. Lambert Academic Publishing, Saarbruecken.

<sup>137</sup> Wilson, I. & Ralston, B. K. (2006) *Scenario Planning Handbook: Developing Strategies in Uncertain Times*, 1st Edition. Thomson South-Western, Mason.

<sup>138</sup> Malaska, P. (1985) Multiple Scenario Approach and Strategic Behavior in European Companies. *International Strategic Management Journal*, Vol. 6 (4), 339–355.



future map that he developed together with professor Ilkka Virtanen.<sup>139</sup> Pentti's collaboration with professor Virtanen was particularly important in rendering the French Futuribles school's scenario thinking model in a mathematically sophisticated form.

Pentti's work around universes of futures and future maps in the early 2000s marked an impressive scientific achievement that eluded even the Futuribles school itself. It was apparent from discussions with Michael Godet, a prominent representative of the French school, that he recognized Pentti's important and influential role in the field of strategy and scenario thinking – yet it was also clear that he had some difficulty directly admitting this. Godet considered himself the high priest of futures studies and even invited me to Paris to learn more. Pentti was a far more modest and humbler character. It was a great pleasure to work with him. There are many gurus in the field of futures research whose ego has become too inflated for comfort. Pentti was not one of them.

One of the hallmarks of Pentti's thinking was his respect and appreciation for scientific holism. He was also highly competent in developing mathematical models for reductionist operations research.<sup>140</sup> In this connection separate mention should also be made of Pentti's synchrony-diachrony modelling framework, in which he managed to integrate reductionist and holistic ideas into a comprehensive modelling system.<sup>141</sup> He began work to develop this model in connection with the Terra 2000 project, which was coordinated by the European Commission and RAND Europe and aimed at developing decomposition models for purposes of trend analysis as well as more complex synchrony-diachrony system models. Pentti Malaska's holistic thinking is described in the previous chapters of this book.

---

<sup>139</sup> Malaska, P. & Virtanen, I. (2002) Tulevaisuuksienkaikkeus. [The futures universe.] In: Malaska, P. (toim.) Eero Kasanen 50 vuotta. Opinnäytetöiden onnittelet. [Eero Kasanen 50 years: congratulations from the thesis circle.] Turun kauppakorkeakoulun julkaisu, Sarja C-1:2002, 71–88. Turku.

Malaska, P. & Virtanen, I. (2005) Orienteering in the Futures Universe: A Map-Analogy-Based Set-Theoretic Approach to the Theory of Futuribles. In: Laitinen, E.K. & Laitinen, T. (eds.) Contributions to Accounting, Finance and Management Science. Essays in Honour of Professor Timo Salmi. Acta Wasaensia No. 143, 261–284.

<sup>140</sup> Malaska, P. & Kinnunen, T. (1986) A Model of Management Goal Setting and its Dissipative Structure. European Journal of Operational Research, Vol. 25, 75–84.

<sup>141</sup> Malaska, P. (2003) Synchronic – Diachronic System Analysis. In: Höglund, R. – Jäntti, M. & Rosenqvist, G. (eds.) Statistics, Econometrics and Society: Essays in Honour of Leif Nordberg. Statistics Finland Research Report 238, 155–164.

## Futures thinking and visionary management

*Markku Wilenius & Laura Pouru*

### *Pentti Malaska's contribution to promoting futures thinking*

*What can be predicted or seen must in some way have existence in the present. Maybe as no more than a possibility, like a tree exists as a possibility in a seed. We are always predicting the present, some of us viewing the landscape from the train's window, others from the roof of the train. The future is a landscape of possible alternatives to the present.<sup>142</sup>*

For Pentti, futures thinking was an exercise of **looking to the future via different ways of thinking**. Visionariness is manifested in the quality of futures thinking, in how creative, consistent and systemic is it. For Pentti, the all-important question was how to release our minds from the shackles of the present horizon. Whoever manages this in a genuine and profound way will be well on their way to creating a truly sophisticated and inspirational depiction of the future.

Thinking that extends into the future can be regarded as a kind of internal observation. As it cannot be immediately validated against external observations, all that remains is its internal force: how and how well you justify your vision of the future. Pentti was well-known for his skill of captivating his listeners and readers. In particular, he moved with great ease and fluency from one perspective to another in his treatment of different possible alternatives.

At the core of the art of visionary management, as Pentti eloquently phrased it in the excerpt above, is the ability to climb onto the roof of the train in order to describe the scenery. Visionary management requires different perspectives on and into the future, a vista on the future. A visionary is someone who knows how to make understandable, here and now, the future as **an alternative**, rather than as a repeat of the present. Many visionary leaders of our time are known exactly for having so clearly seen things way ahead of their time. In the late 1990s, for instance, Steve Jobs recognized that smart terminals would become ubiquitous tools of personal information and data management. True, the early signs were there, but the clarity of Steve Jobs's vision was unparalleled. Out of all the possible futures that were germinating at the time, he was able to see the exact one that materialized – and that he contributed to create himself.

---

<sup>142</sup> Pentti's interview. Tehokas yritys (1/1975) Laadullisen kasvun tajuaminen tärkeää yritysjohdolle. [Understanding qualitative growth crucial for business management.]

From a management standpoint, however, it is not enough for someone to see that the seeds of a future have flowered in a certain time perspective. It is also necessary to find a way in which that future can be reached. What has to be done to turn what could exist into what exists in the future? The challenge of visionary management thus has two sides to it: first, one has to find an inspiring and meaningful point of anchorage in the future and second, one has to construct a view of how that future can be reached. It is only a combination of both that will produce visionary management.

It was from these premises that Pentti worked his entire professional career to develop methods that can help different kinds of communities respond to these two challenges. And as this chapter will show, Pentti indeed created a whole 'cosmos' for visionary management, allowing anyone and everyone to understand how visionary management stands apart from other future-oriented development thinking.

Scenarios, visions and strategic management were key areas of interest for Pentti throughout his career. He introduced countless business leaders as well as Bank of Finland and state leaders to the world of scenarios and visionary management. Pentti was involved in many cross-sectoral discussion groups (such as the Academy of Ilpo and the Kone Corporation's systems group) in which business leaders and high-level experts came together to discuss topical issues. In the first decades of his career Pentti was focused on developing the scenario method, later he moved on to developing the ideology of visionary management.

*Alas, not everyone who gets to make decisions has realized that the reason for the recent bad decisions lies not in the changed environment, slowed growth, uncontrolled unemployment, etc., but in unchanged decision-making. The search for salvation must therefore concentrate on what's going on between the ears, not outside them. After all the environment will continue to change regardless of us and our desires. – Decision-makers who are only now beginning to suspect that there may be no going back to times gone by and that the future is not going to become any more certain and predictable at least in the next few decades, are certainly none too early in their realization.<sup>143</sup>*

Pentti divided business companies (and other organizations) into four categories based on how consciously they face the future (Fig. 17). Companies showing an attitude of resignation to the future accept the future as it comes, believing there is very little they can do to alter its course. Those showing an opportunistic attitude to the future aim to make the best possible use of existing opportunities, assuming that the conditions will not change very dramatically. Companies that take an

---

<sup>143</sup> Pentti's column. Kauppalehti 2.12.1982. Pelastus korvien välissä. [Salvation between the ears.]

adaptive attitude to the future aim to adjust and adapt their operation to changes imposed from the outside. And finally, companies with a creative orientation to the future believe it is possible for them to influence and actively shape future development.

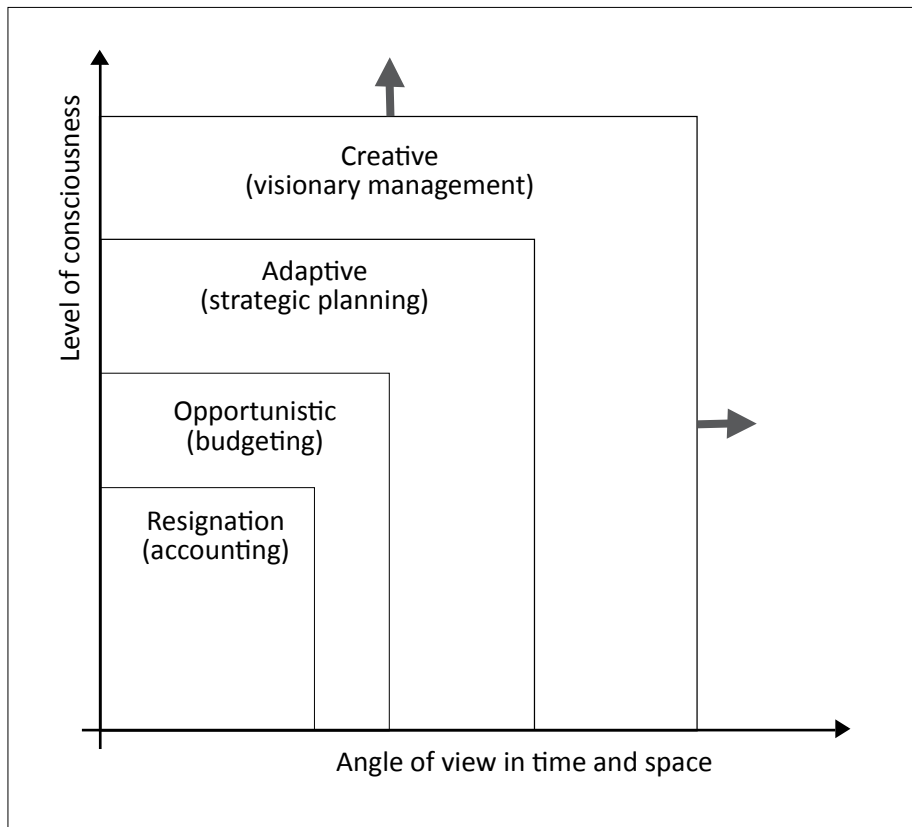


Figure 17. Different company attitudes to the future.

## Visionary management

*The only possible way for a company to get a handle on the future is to change. The first, pioneering stage in a company's development is followed by the stage of scientific management in which many companies are currently bogged down. They'd need to break out of this rigidity and move towards the stage of integrative consciousness, which means rekindling the strengths of the pioneering stage, such as the spirit of cooperation.<sup>144</sup>*

Visionary management is based on the idea of taking a long-term view on the future. It implies a longer time perspective than ordinary strategic management, extending up to 10–15 years ahead of time and even further if necessary. In visionary management the present is viewed from the vantage-point of the future, considering how the future portrayed in the vision can be reached (Fig. 18).

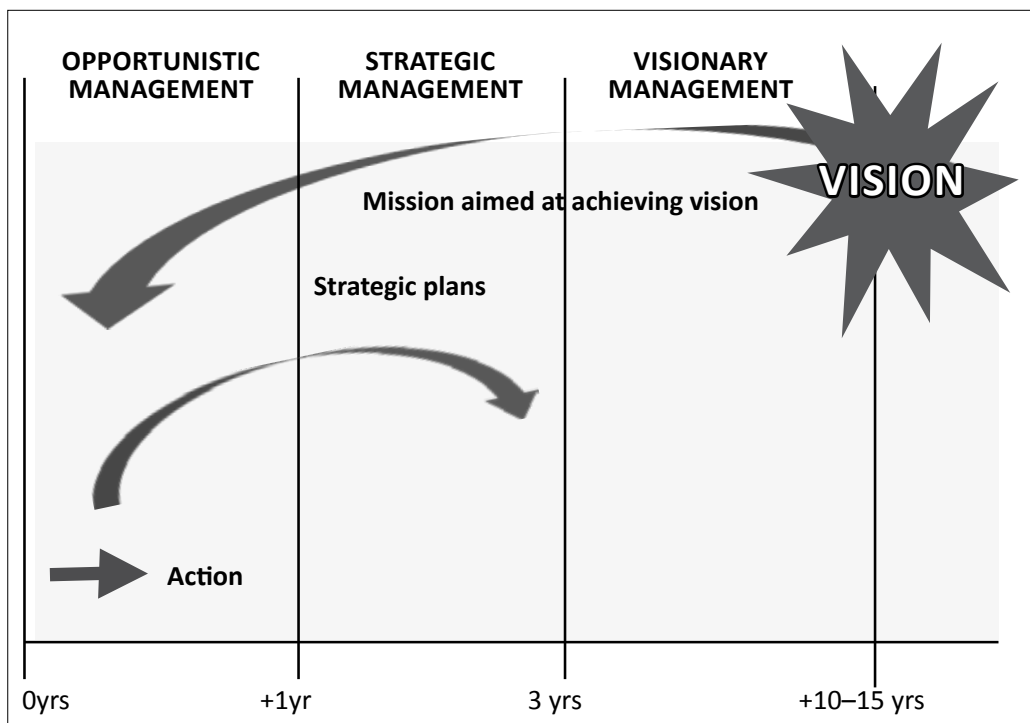


Figure 18. Framework for visionary management.

<sup>144</sup> Pentti's interview. Aamulehti 19.5.1995. Vähemmästä saadaan irti yhtä enemmän. [More is being produced from less.]

Visionary management is grounded in the elements of good decision-making as introduced by Aristotle (Fig. 19). According to the Aristotelian principle good decision-making is based on three elements:

- accurate definition of purpose and objectives
- understanding of the prevailing situation and circumstances
- knowledge about the means and resources available.

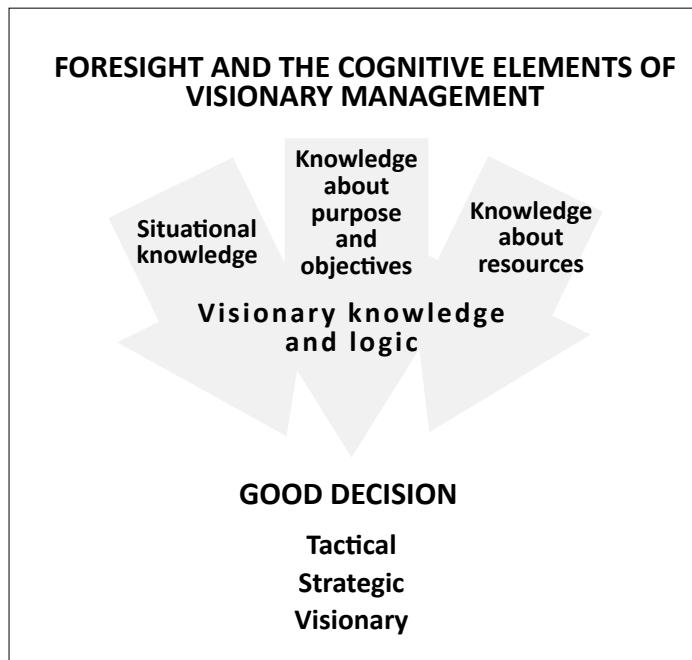


Figure 19. Cognitive elements of visionary management.

Taken together, these three elements – situational knowledge, knowledge about purpose and objectives, and knowledge about means and resources – lead to what Pentti called visionary knowledge. This type of knowledge about the future is grounded in an Aristotelian world-view. Visionary knowledge and its underlying logic lay the foundations for high-quality decision-making about the future on all three of its temporal dimensions: short-term tactical, medium-term strategic and long-term visionary decision-making.

Based on these three elements, then, we can identify three different decision-making situations: opportunistic, strategic and visionary decision-making (Fig. 20).

Opportunistic decision-making refers to making the best possible decision under stable, invariable conditions. Strategic decision-making is effective when conditions are unsettled, yet more or less predictable. Visionary decision-making, then, makes sense when conditions are completely new and unknown or when they are characterized by discontinuity and unpredictability.

<b>Determinants of decision</b>	<b>Opportunistic, tactical decision-making</b>	<b>Strategic decision-making</b>	<b>Visionary decision-making</b>
<b>Situation assumed to be</b>	known	unpredictable but explicable with scenario conditions	discontinuous and uncertain creative destruction
<b>Purpose &amp; objectives</b>	maximize profit, cash flow or short-term benefits	adaptation to environment for growth and better ROI	excellence of long-term performance, finding new arenas, survival in the future
<b>Means &amp; resources available</b>	fixed and conditioned by strategy	reallocation of available and attainable resources within prevailing vision	new skills, reframing of business, envisioning, creating new capabilities
<b>Management</b>	by control	by strategic positioning	by visionary leadership

Figure 20. Three different contexts for decision-making.

Pentti was firmly of the opinion that visionary management was an activity with a given context, that it always happens in a given historical situation. Visionary leaders or companies often have to challenge their contemporaries who fail to see things in the same way as they do because they are in some way captive to their own past. This also applied to Pentti himself, who in the nuclear power issue, for instance, had to contend with some strong prejudices. His attempts to highlight the dark sides of nuclear power gained very little recognition from the establishment, despite his extensive research in the field. On the contrary, his arguments were routinely brushed aside as discreditable. But Pentti was adamant. As well as following the debate on nuclear power, he kept a close eye on advances and developments in technology. All the evidence he had gathered was enough to convince him that under the current technology and safety regime, nuclear power was not a sustainable form of energy production. From a visionary perspective, it was necessary to develop better alternatives to nuclear power.

For Pentti, then, visionariness implied a rigorous commitment to the future. The creative side of visionariness means rising above the resigned, opportunistic and

adaptive perspective and turning the focus to what is essential and sustainable over time. It means having the audacity to ‘defend’ the future, even at the threat of being ridiculed or crushed if this defence stands in the way of others’ opportunistic interests. In this connection Pentti sometimes liked to quote his colleague Jim Dator, who used to say that if a future idea isn’t initially ridiculed, then it can’t be a good idea to start with.

Visionary thinking, Pentti maintained, stands apart from all other types of future-minded thinking. Visionary thinking is something where the present is viewed from the angle of some ‘future imperative’, in other words **the future is brought into present decision-making** (see Fig. 18). This is visionary thinking in its broadest sense. One business-world visionary, founder of outdoor clothing company Patagonia and committed environmentalist Yvon Chouinard, has said that ‘I know it sounds crazy, but every time I have made a decision that is best for the planet, I have made money’. Visionary thinking is not an obstacle to good business. But it does often require courage.

Visionary thinking tends to take us out of our comfort zone. In opportunistic or tactical decision-making, our aim is to take advantage of the current situation as quickly as possible, to maximize our short-term yield by controlling the immediate future as far as possible. It is safe to suggest that the 2008 financial crisis grew out of the hegemony of just such opportunistic thinking, which was allowed to flourish so that no party that might have been able to influence the course of developments (such as the US Federal Reserve System) wanted to admit there were any problems. Opportunists were given a completely free rein. Strategic decision-making, then, will avoid any rash opportunistic moves, but nor will it aim to create a future scenario that differs significantly from the present. The aim and purpose is to adapt to current trends in development, within some time frame. During the financial crisis, for instance, the strongest financials reallocated their resources in advance and in so doing also saved themselves.

For Pentti, visionary thinking appeared as a process where change (say the financial crisis) is identified and sketched in advance and an image is created of what the world looks like after that change. How will it change business, what kinds of new skills and abilities will it require? These questions, above all others, steered and influenced Pentti’s practical work as he sought to promote visionary management in companies. Let us move on now to look at how the process of visionary management is structured.



## ***Visionary management in practice***

In practice, the process of visionary management involves weighing a company's current resources and creating a vision of where the company should be in the long-term future. In other words, a vision is produced of the organization's current resources and desired future resources (Fig. 21).

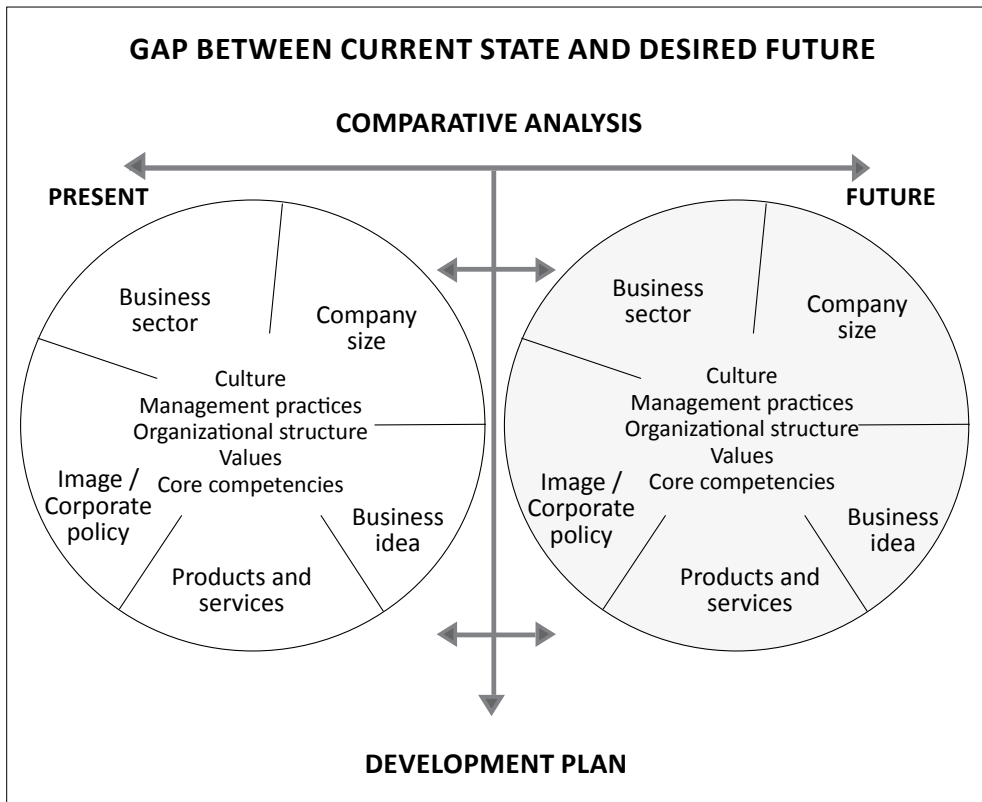


Figure 21. Background problems of visionary management.

The idea, then, is to focus first on what lies at the core of the business: its culture, management practices and systems, organizational structure, values supported by the company and the company's strengths or core competencies. Furthermore, it is necessary to look at the company's outside image and its corporate policy. The company's business sector, size, business ideas and products and services are also carefully defined.

All these components, put together, will yield an analysis of the company's current state, which is complemented by an assessment of the company's performance. Which areas of the company's operation are in good health and sustainable, i.e.

demonstrate signs of continuity? Which areas are not working properly, which are causing too many problems or have become outdated? For example: Is the company operating in line with its declared values? Do the company's products and services meet its clients' requirements and expectations? Or have changes in the operating environment rendered the business idea outdated in that environment?

The analysis of the company's current state lays the foundation for the examination of its future. The whole idea of visionary management lies in creating a coherent image of the future, where only part of what is observed in the current state will have continuity. What exists now is compared with the desired vision for the future (Fig. 22). In the visionary process itself, the vision serves as the driving force of all strategic management. Once the vision has been created, the focus is turned to how the current resources compare with the desired future state and to what measures are needed in order to reach that future state. The practical tools of visionary management include open communication, a systematic approach, a system for collecting weak signals and other information about the future, and an examination of one's own company from the outside and from a future vantage-point.

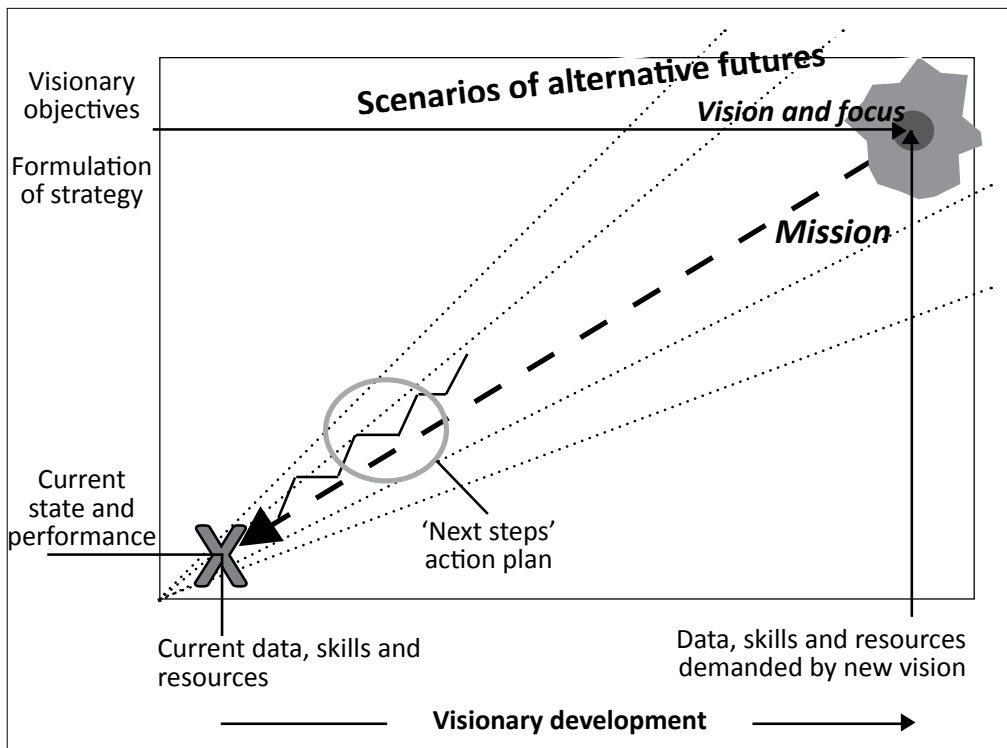


Figure 22. Framework for the development of visionary management.

One key element of visionary management is the vision itself. A good vision is not just how a few people happen to view the desired future, but it is consciously and collectively created. A good vision is consistent and allows people at all levels of the company to identify with it. Furthermore, a credible vision should go beyond the pursuit of self-interest and make a statement about the company's broader role and meaning in the world. However, a vision is not just an inspiring story shared with the outside world, but a genuine action plan intended for implementation. According to a list drawn up by Pentti, a good vision meets the following requirements:

### ***A good vision***

- is convincing and challenging
- is consistent and can be identified with at all levels of the company
- is a coherent and realistic construction without catastrophic risks
- is flexible in a turbulent world
- coordinates and synchronizes company decisions across the board
- is communicative and delivers the message
- provides a basis for the appreciation of people's work.

A vision is also an important means of communication both within and outside the company. Indeed, the credibility of a vision depends on how reliable it appears to people both within the company and among clients and other stakeholders groups outside the company.

If visionary management is broken down into process components, it can be described as consisting of the following stages:

1. In most cases the driving force for foresight activities is uncertainty about the future. It is important to explore these uncertainties more closely because they can be used to construct different kinds of future scenarios. Are markets showing a tendency to tighten in the future, or will the future open up new opportunities for existing markets? The weighing of alternative future scenarios involves creating an image of the key factors potentially associated with changes in the operating environment.
2. Once these key factors of change have been established, the next stage is to present an analysis of the current state as described above. This analysis should reflect reality as accurately as possible: it must not turn a blind eye to impor-

tant challenges and problems. For instance, it is possible that the company's 'official stance' says that its main strength lies in logistics, even though in reality this hasn't been true for the past 10 years.

3. It is only now that the process moves on to elaborating the vision and mission in accordance with the criteria specified above. It is crucially important that the vision is grounded in a realistic description of the current state, otherwise the vision itself will probably be highly unrealistic. Here, the mission is part of the vision: it indicates the company's wider role and significance in the world.
4. The company's objectives are then derived from the vision. These objectives may be related to any item in Fig. 20. The objectives establish the vision and mission as part of the company's everyday operation.
5. The vision also determines what new information, skills and other resources need to be developed in order to achieve the objectives derived from the vision. This aspect of development is often neglected. In companies based on information processing, the key issue here is whether they have the right people with the necessary development potential in the right key roles.
6. Out of all this emerges the company's visionary development, comprising all the components mentioned above.
7. The company's visionary development is supported by building a strategy, which in this case means putting the vision into practice in the organization.
8. To support implementation a 'next step' plan is created, a road map that for each objective specifies
  - a. what exactly is done with the objective
  - b. how the objective will be implemented
  - c. who are responsible for implementation
  - d. what is the timetable for implementation.

To sum up: Visionary management requires **thoughts** to know and understand oneself and the surrounding world; **emotions** to commit oneself to the vision; and **willpower** to make the vision happen. Pentti said that implementation of the vision required an abundance of both knowledge and emotions and above all willpower.

The basis and foundation for visionary management, as indeed for all other activities in which Pentti engaged, was comprehensive and systemic thinking. Just as

people's actions can only be understood by accepting and recognizing the different essential sides to humans, so companies can only be developed as a collective by viewing humans as wholes and by understanding their real motives.

Seen from this standpoint, the role of a vision is not only to provide direction, but also to create a strong emotional commitment to the organization's objectives. When the process of visionary management has as broad a foundation as possible, it allows people to see themselves as part of the company's future, which in turn encourages them to make a comprehensive investment in the organization's future.

## Putting visionary management to practice at the Academy of Ilpo discussion group

*Karin Holstius*

*This text is based on an article (available in Finnish only) by Ilpo Siro and Paavo Okko on the Academy of Ilpo and its role in promoting futures thinking.*

Pentti was keen to promote futures thinking and visionary management in decision-making, and to this end worked as a consultant for several major corporations and SMEs. Ilpo Siro and Paavo Okko have compiled some of their recollections of Pentti and his contribution to a discussion circle that was set up in 1978, the so-called Academy of Ilpo. The idea for the Academy was concretized when Pentti was supervisor for a local bank in Turku and used to spend time exchanging views on visionary management with the bank manager, Ilpo Siro. The key idea was that companies will be successful if their clients are successful, and the same applied to the bank: in order to be successful its clients had to be successful, too. The Academy of Ilpo got underway when Ilpo Siro invited a number of client companies into joint discussions on the conditions for business success. The purpose was not to provide a consultancy service, but rather to promote future-oriented thinking in companies, i.e. visionary management.

In its early days the Academy involved six entrepreneurs: a medical doctor who had founded a private clinic; an engineer who had founded a machinery company; the owner of a kitchen fitters company; an economist running a family-owned service company; a self-employed wood technician; and an industrial designer. This mixed group shared the common goal of improving their entrepreneurial skills and so to bolster their business success – which, in hindsight, it is fair to say that they certainly did!

This pioneering group followed the basic principles of management training and each member prepared a written mission statement for their company. Under Pentti's lead, these mission statements were discussed and analysed at the group's meetings. The idea at this stage was to apply futures thinking as a means of supporting business management. The group continued to grow in size and the range of issues covered at its meetings continued to expand. Eventually the Academy of Ilpo began to host discussion forums with a few invited speakers, and the participants prepared extensively for their forthcoming discussions. Over the years the core Academy group has involved some 20 members, with the peak number of participants reaching as many as 50.

The Academy's discussions have touched upon a broad range of issues concerning society, the economy and culture. Questions around entrepreneurship and companies' social responsibility have also featured on the agenda, and the group has discussed entrepreneurship as a matter of faith and the essence of market economy.

The Academy has had no formal organization but has continued to remain active in various forms for almost 40 years now. It has been held together by a common interest in key socio-economic issues. The Academy's sessions are private, but on some occasions reports have been prepared and published in university series, and articles have been written for newspapers and magazines. Pentti was regarded as the founder and soul of the Academy. Since 2012 it has continued in at least some form under Ilpo Siro and Paavo Okko.



Pentti and Ian Wilson in Turku on 15 March 1996.



Visitors at Luumäki from the Academy of Ilpo in summer 1998.  
In the foreground Ilpo Siro, Markku Jalkanen, Pentti and Pentti's wife Karin.



Pentti and his wife Karin at Rockefeller's Bellagio Center in March 2003.



## 9. OTHER AREAS OF INTEREST FOR PENTTI MALASKA

## Futures research, operations research, statistics and mathematical modelling

*Jari Kaivo-oja*

Pentti Malaska's scientific thinking is firmly grounded in empirical applied research and statistics. One particularly major source of inspiration for him were the challenges of operations research and strategic management. It was not uncommon to find him deeply engrossed in some current research problem, working to develop a mathematical systems model while attending a scientific meeting – to the huge amazement of colleagues around him. On one occasion I witnessed the famous INSEAD professor Robert Ayes rolling his eyes in disbelief as Pentti began calculating his equations in the middle of a meeting. He could come up with a brilliant, profound scientific note in an instant.

In order to trace the evolution of Pentti's scientific thinking we need to go back to his 1963 doctoral thesis, in which he presented a time series examination of the structure of electrical energy consumption in Finland in 1945–1963. His work was at the absolute cutting edge of statistical research on electricity generation in Finland in the 1960s. In a sense it was also a piece of futures research in that it provided strategic projections for future electrical energy consumption in the country. Indeed, Pentti Malaska was without question at the very forefront of statistical forecasting research at the time. And of course he returned to this subject later on in his career.<sup>145</sup>

One of the regrets that Pentti expressed with regard to his doctoral thesis had to do with his chance discovery of the Box-Jenkins method – which of course wasn't known by that name at the time. There would have been every justification for him to call it the Malaska method.<sup>146</sup> He often felt that he did too much of his work on his own: in a team environment, he said, it would have been easier to put his ideas to the critical test. Pentti's doctoral dissertation perhaps says something important about his positive and open-minded research approach and indeed about his pioneering spirit in the field of futures studies. Pentti was a scientist who was always keen to support his junior colleagues, who always had something

---

<sup>145</sup> Malaska, P. & Virtanen, I. (2007) *Uskottavaan päättelyyn perustuvasta todennäköisyysteoriasta*. [Probability theory based on credible deduction.] Turun kauppakorkeakoulun julkaisuja, Sarja C. Turku.

<sup>146</sup> Malaska, P. (1963) *Aikasarjoihin perustuva tutkimus sähköenergian kulutuksen rakenteesta Suomessa vuosina 1945–1963*. [A time-series based study of the structure of electrical energy consumption in Finland 1945–1963.] Nide 18. Suomen teknillinen korkeakoulu, Helsinki.

supportive and encouraging to say.

Pentti Malaska's first efforts in the field of futures research were empirical forecasting studies. Later, he expanded into the areas of game theory, operations research, systems theory and the reductionist and holistic modelling of systems. These themes eventually brought him into the domain of futures studies proper, where he contributed significantly and in various ways to the scientific literature.

From a historical perspective, it is interesting to observe that Pentti was the first scholar in Finland to present a mathematical game theory modelling of public-private partnerships in the country.<sup>147</sup> Likewise, he proposed the first operational solution and mathematical model of national energy storage and transport logistics as early as 1968.<sup>148</sup> These studies remain original and unique exercises in mathematical modelling, with an integral connection to a concrete research problem.

Pentti Malaska was also in the frontline when mathematically oriented operational and action planning first got underway in Finland.<sup>149</sup> He was very closely involved in these efforts from the earliest stages. The following excerpt is from the chronicles published by the Finnish Operations Research Society in 2003:

'Malaska recalls how in the early 1950s Olli Lokki was invited to bring his students along to see a computer at IBM's offices. It was a unit used for demonstration and teaching purposes and, to all intents and purposes, a 'manual' device. 'We got to program additions and subtractions on the computer', Malaska says. 'This involved following the instructions and connecting a wire from point A to point B, and another one from point C to point D, etc. The sense of joy was palpable when we managed to send the 'computer' into an endless loop.'

This brief excerpt delightfully captures Pentti's excitement over the prospects of being able to apply new technology to research.

Pentti supported this scientific orientation to operations research and mathematical modelling at the Turku School of Economics as he supervised the doctoral dissertations of numerous leading researchers. His study circle included such prominent names as Rector of the University of Vaasa, Professor Emeritus Ilkka Virtanen; Rector, Professor Tapio Reponen; Professor Paavo Okko; and Rector,

---

<sup>147</sup> Malaska, P. (1967) Yksityisen sektorin ja julkisen sektorin yhteistoiminnan edellytyksistä määrättyllä toimialalla. [On the preconditions for private-public collaboration in a specific industry branch.] *Kansantaloudellinen aikakauskirja*. LXIII, Nide 1, 35–40.

<sup>148</sup> Malaska, P. (1968) Onko maamme lämmitysöljyn tuontikapasiteetti oikein mitoitettu? [Are we importing the right amount of heating oil into Finland?] *Kansantaloudellinen aikakauskirja*, LXIII, Nide 1, 130–139.

<sup>149</sup> Malaska, P. (1970) Operaatiotutkimus. [Operations research.] *Kansantaloudellinen aikakauskirja*, LXVI, Nide 1, 31–37.

Professor Eero Kasanen. Pentti also supervised many doctoral dissertations in the field of futures research, including those of Tarja Meristö, Mika Mannermaa and Anita Rubin. Pentti Malaska was an important scientific tutor who had a highly influential ‘research programme’. He was also keen to promote operations research, to which end he founded an ADP Centre at the Turku School of Economics to provide support for research in the field. Computers and their computational power were a source of great fascination for Pentti. There is no question that he would be hugely excited about the potential that big data brings to futures research.

Professor Pentti Malaska strongly emphasized the role and significance of practical scientific applications in his research. Research for research’s sake was a completely alien idea for him. It is appropriate here to quote a text of his from 1970:<sup>150</sup>

‘To quote the words of Rivett and Ackoff,<sup>151</sup> a large proportion of scientists avoided dealing with problems that would have had significant application. Instead, they specifically aimed to ensure their research was not tarnished by thinking in terms of practical benefits. It was also not uncommon to defend this attitude by arguing that practical problems were not as difficult and therefore not as attractive as problems of pure science. From this attitude it followed that the engineers who were working at R&D laboratories for business companies and armies to develop various innovations and who even engaged in new basic research, were not always counted among the ranks of scientists. The reason for this was not that their methods and results did not stand up to scrutiny, but rather that they had allowed their goals and objectives to be influenced by benefits thinking and so had sold their soul to Mammon. During the Second World War this attitude clearly changed in Western countries, by all accounts for good. The change was not brought about by business companies or productive organizations, but by military organizations. Two decades had passed since the previous war, and during this period weapons and other military technology had advanced by leaps and bounds. Indeed on the eve of the Second World War, military leaders came face to face with the fact that they had access to highly efficient new systems, but no experience of how to use them in real-life conditions. In this situation military leaders turned to scientists in order to get help with the use of these new systems. Indeed several scientists chose to discard their earlier attitudes towards applied research and accepted these assignments. The first efforts got underway in England, where this line of work evolved as a sideline of military R&D departments.’

---

<sup>150</sup> Malaska, P.(1970) *Operaatiotutkimus*. [Operations research.] *Kansantaloudellinen aikakauskirja*, LXVI, Nide 1, 31–37.

<sup>151</sup> Rivett, P. & Ackoff, R. L. (1963) *A Manager's Guide to Operational Research*. New York.

The inference we can draw from this excerpt is that Pentti was a truly R&D oriented researcher and that he recognized from very early on the significance of operations research to economics and to futures studies. In the field of operations research, he felt he had an important ally in Olli Lokki, Professor of Applied Mathematics at Helsinki University of Technology. In 1980–1984, Professor Olli Lokki still served as Director of the Finnish Academy of Technical Sciences, so from this point of view Pentti was certainly under great pressure to further the development of Finnish science and research.

Pentti was keen to put research to practical application in business and industry, in the same way as Olli Lokki had put mathematics to use in the Finnish air force during the war. He wanted to transfer the same model to business consultancy and contribute to the creation of visionary, high flying Finnish business.<sup>152</sup> At this juncture it is also interesting to note that Pentti devoted a significant part of his inaugural lecture to the so-called radar analogy.<sup>153</sup> In hindsight, this can surely be seen at least as a weak signal of what was to follow.

Pentti would always closely follow the latest trends in scientific research. For instance, he was well aware of the importance of British operations research and the work that was done at the RAND research institute, and in his inaugural lecture in 1969 made reference to the legendary ‘Blackett’s circus’, a highly influential multidisciplinary research team in the UK. In his lecture Pentti stressed the importance of multidisciplinary research and systems thinking, which would be clearly reflected in his work as first Director of the Finland Futures Research Centre.<sup>154</sup> Multidisciplinary research, Pentti insisted from early on, would be hugely useful for Finnish business.

Another area in which Pentti showed great interest was complexity thinking and its evolution. He wanted to apply these ideas to research in sustainable develop-

---

<sup>152</sup> Miettinen, E. & Malaska, P. (1980) Yrittäjän näkökulmasta. [The entrepreneur’s perspective.] Koneen Systemiryhmä A-8. Helsinki

Lehto, S. T. (1996) Muistikuvia ja merkintöjä. Teollisuuden piirissä koettua. [Recollections and experiences from the realm of industry.] WSOY, Helsinki.

<sup>153</sup> Malaska, P.(1970) Operaatiotutkimus. [Operations research.] Kansantaloudellinen aikakauskirja, LXVI, Nide 1, 31–37. p. 37.

<sup>154</sup> Malaska, P.(1970) Operaatiotutkimus. [Operations research.] Kansantaloudellinen aikakauskirja, LXVI, Nide 1, 31–37.

Mannermaa, M. & Malaska, P. (1992) Innovatiivinen yhteiskuntakehitys ja teknologia. Tulevaisuuden tutkimuskeskuksen tutkimusohjelman suunnitelma. [Innovative social development and technology. Research plan for Finland Futures Research Centre.] Turun kaupparkeakoulujen julkaisuja. Keskustelua ja raportteja 3:1992. Turku.

ment.<sup>155</sup> His aim was to gain an in-depth understanding of post-industrial society.<sup>156</sup> He closely followed the work that was done at the Santa Fe Institute, for example. Before the Finland Futures Research Centre was founded, he toyed with the idea of creating a ‘Centre for Complexity Research’. This idea never got the necessary support, however, so he turned his efforts instead to promoting the launch of the Finland Futures Research Centre.<sup>157</sup>

---

<sup>155</sup> Malaska, P. (1976) Non-Waste Technology and Production. Proceedings of an International Seminar Organized by the Senior Advisers to ECE Governments on Environmental Problems on the Principles and Creation of Non-Waste Technology and Production, Paris, 29 November –4 December 1976, 33–38.

<sup>156</sup> Kaivo-oja, J. – Ahokas, I. – Malaska, P. & Luukkanen, J. (2002) The Information Society and Changes in the Labour Market: A Comparison of Work Profile Changes in the EU, the USA and Japan. In: Stanford-Smith, B. – Chiozza, E. & Edin, M. (eds.) Challenges and Achievements in E-business and E-Work, 504–511. IOS Press, Amsterdam.

<sup>157</sup> Mannermaa, M. & Malaska, P. (1992) Innovatiivinen yhteiskuntakehitys ja teknologia. Tulevaisuudentutkimuskeskuksen tutkimusohjelman suunnitelma. [Innovative social development and technology. Research plan for Finland Futures Research Centre.] Turun kauppakorkeakoulun julkaisuja. Keskustelua ja raportteja 3:1992. Turku.

## Pentti Malaska's Thesis Circle

*Karin Holstius*

In 2013–2015, the Finland Futures Research Centre and the Finnish Society for Futures Studies hosted a seminar in memory of Pentti to revisit his career and work as a pioneer of Finnish futures research. The seminar was held on his name day on March 21. The first memorial seminar was in fact held earlier in autumn 2012, and on this occasion the preparations also involved the Thesis Circle and the Academy of Ilpo. The seminar title was 'Future as a mission', and members of the Thesis Circle contributed in force to share their memories of Pentti's research and contribution to the doctoral programme.

The Thesis Circle members also wrote an obituary for Pentti that appeared in the Turku School of Economics's *Mercurius* journal 2/2012. The following are some excerpts from this piece, describing Pentti's informal research team that was to evolve into the first doctoral research programme in Turku and the whole of Finland in the early 1970s.

**Ilkka Virtanen:** 'Not only was the programme among the first in its field, it was also progressive and open-minded: it had a multidisciplinary orientation, with teachers and students coming from many different universities, and from the outset it placed great emphasis on publishing and international exchange. The programme became very comprehensive. It comprised both work and pleasure. Excursions and their scientific and social programmes were a key component of education. I'm proud to be able to say I'm a product of this doctoral programme, even though formally I earned my doctorate from the University of Turku.'

**Tapio Reponen:** 'I remember Pentti from those days as a deeply enthusiastic person who had great expertise. He was a wonderful supervisor and teacher. To us computational economists, he taught the foundations of electrical consumption forecasting, electrical power generation and their economic analysis. Gradually, we learned enough to be able to build more accurate consumption projections and models for investment planning. Under Pentti's expert guidance, we reached the international cutting edge in the field of operations analysis. Contacts were established with the Bank of Finland as well as with many significant business companies.'

**Pekka Pihlanto:** 'Pentti was a strong personality and an influential opinion leader. For outsiders, he may have appeared as a formidable opponent when opinions clashed. But within our team the spirit was quite democratic – even when Pentti

was the only professor and all others were assistants. Within the group he even tolerated being made fun of – he genuinely was one of us. Later our circle expanded to involve group discussions that helped to keep up the team spirit. At our last meeting, Pentti's illness already cast some shadow over our typical optimism.'

**Paavo Okko:** 'Pentti made an impression with his directness, because at the time many professors were quite distant characters. Imagine a young researcher getting into a professor's immediate circle – indeed, becoming his friend – and seeing the distance to the professor being reduced. This was easy to regard as an indication that one had moved to a higher level. But our discussions contributed to this anyway.'

**Eero Kasanen:** 'Pentti became the turning point in my research career. I had heard there was a new professor at the Turku School of Economics who wanted to save the world with mathematical models and who was active in the Club of Rome. Besides he was a great guy who played tiddlywinks with his students. I decided then and there to go and ask whether I could continue my maths studies at the University of Turku under his supervision, as his doctoral student. And this is what happened. It's certainly something that will stay with a doctoral student for the rest of his life when the professor hurries into the office, gathers all the assistants around him and says: We're not going to do any research here that does not concern all of humankind and a time span of at least one thousand years.'

Summing up their presentation, the Thesis Circle members concluded with the following words: 'Pentti was also among the pioneers of operations research in Finland. He was a founder member of the Finnish Operations Research Society. The first doctoral dissertations completed under Pentti's concrete supervision – Ilkka Virtanen, Tapio Reponen, Eero Kasanen – represented an operations analytical approach. Professor Pentti Malaska was a creative philosophical researcher and a poet whose life was filled with constant deliberation about the grand issues and with deep, ongoing discussions and exchanges with colleagues. He made a strong impression on the future even through his friends.'





## Pentti Malaska's Chinese connections

*Karin Holstius*

In 1984 the Club of Rome convened in Helsinki for a meeting to which observers had been invited from China. It was no doubt for this reason that Pentti, in his capacity as host of this meeting, received an invitation to travel to China the following year, with five persons of his choice. He decided he wanted to be joined by futures researchers: Matti Vapaavuori, Mika Mannermaa, Heikki Hämäläinen (who at the time was Chairman of the Helsinki Futures Research Society) and Karin Holstius.

The invitation came via the Chinese Association for International Understanding or CAFIU. We were treated liked state dignitaries and driven around in a Mercedes across Beijing and up to see the Great Wall of China, the emperors' tombs and the Summer Palace. We stayed at government guest houses and hotels.

All five members of our delegation presented a paper at the seminar in Beijing. The seminar attendance included Chinese experts from various fields, with whom we had extensive discussions about environmental issues and the Chinese economy. The Finnish participants' papers were on the following subjects: Pentti Malaska, Environmental Problems of Modern Societies; Matti Vapaavuori, Networking in the Changing World; Mika Mannermaa, Futures Research and Social Decision-Making – Alternative Futures as a Case Study; Heikki Hämäläinen, Changing Forms of Communications and Autonomous Decision-Making; and Karin Holstius, International Marketing when Buyer and Seller Environments are Dissimilar.<sup>158</sup>

Our internal flights during the trip on 2–12 Sept 1985 also gave us the opportunity to visit the Yunnan province, including its capital Kunming and the stone forest, as well as the special economic zones in coastal southeast China, including Guangdong (Canton) and Xiamen. We were also invited to visit a typical Chinese family, a Chinese printing shop and a bicycle factory. On the streets of Beijing, most of the traffic consisted of bicycles, busses and trucks, although we did spot the occasional car as well – mostly on government business. Finally, we made a visit to Hong Kong, providing a fascinating contrast to the People's Republic of China.

---

<sup>158</sup> Workshop of Futures Studies in Beijing 4–5 September 1985 (1985), Publication of the Finnish Society for Futures Studies, Series A8.

In 1991, Pentti was again invited to China. This time, he was joined on the trip by Torsti Kivistö, Marketta Kivistö, Mika Mannermaa, Seppo Remes and Karin Holstius. The two-week trip took place in May 1991.

Again, Beijing hosted a seminar, which on this occasion was more clearly focused on futures research. On Pentti's initiative, the seminar had the following title: 'Matching Futures. Sino-Finnish Seminar on Futures Research'. The Finnish participants presented six papers at the seminar: Pentti Malaska, Challenges for Innovative Technology; Seppo Remes, Future Scenarios of the Soviet Union and Eastern Europe; Mika Mannermaa, An Evolutionary Approach to the Post-Industrial Society of the Future; Torsti Kivistö, Future of Housing, Building, and Town Planning; Marketta Kivistö, Work and Leadership in the Future – Experiences from the Finnish Industry; and Karin Holstius, Sino-Finnish Joint Ventures and Other Forms of Technology Transfer – Problems and Opportunities. All seminar papers were compiled into a joint report, which included summaries of the discussions held at the seminar.<sup>159</sup>

As in 1985, the Finnish delegation was given an extensive tour of Beijing and environs. This was followed by a trip to Xian in Central China, where work had just been completed to unearth large parts of the Terracotta Army. The itinerary also included visits to Buddhist temples in various locations, as well as a visit to a Valmet paper mill in Xian. In the meantime, Pentti made a lengthy detour to Pyongyang in North Korea to hold discussions on cooperation with the WFSF. In Shanghai, the Finnish delegation visited the Pudong SEZ, which at the time was still under construction. In Shanghai, we visited the world's largest steelworks Baoshan General Iron and Steel Works and the local Volkswagen plant.

On both our trips we had several hosts, but our lead host was Ma WenPu, who had served for a few years as Chinese representative in Sweden and Finland and who spoke both languages.

After these two visits to China, and inspired by the Chinese research we had done at the time, we launched the Sino-Finnish Environment Programme (SIFE). Organized and coordinated by Pentti Malaska and Karin Holstius, this project involved five Finnish universities from Turku and Tampere and seven Chinese universities. There were in fact two projects, the China publications in the Turku School of Economics series and the SIFE project. As is made clear in the prefaces to these publications, both these projects were aimed at promoting the transfer of environmental technology between Finland and China and at improving understanding of environmental management and at enhancing cooperation between

---

<sup>159</sup> Matching Futures, Proceedings of the Sino-Finnish Seminar on Futures Studies in Beijing (1993) Futura 1/1993, 117–129.

academic researchers, business companies and institutions. This was achieved both in the form of seminars and numerous visits to Chinese environmental institutions and companies.

Launched in 1994, the SIFE project began to wind down in 1999–2000 when Pentti and I retired. Environmental seminars were held mainly in Beijing and Shanghai. In 1996 we also attended the Ahtisaari seminar in Beijing, where Finnish environmental technology was introduced under the title of ‘New Developments in Science and Technology’. Covered extensively in the Chinese media, the seminar gave us an excellent opportunity to introduce the SIFE project and to take part in an associated technology exhibition. Finland also hosted one SIFE seminar together with colleagues from participating Chinese universities.

Several studies were completed under the umbrella of the SIFE project, which were published in the Turku School of Economics series under the title ‘China Project’. Separate mention may be made of the following publications: Funding opportunities for environmental technology projects: focus on China; Decision making for the acquisition of environmental technology: Law and practice in Shanghai; Investment zones in the PRC; and China project: country risks.

In the 1990s Sun JiWu – who came to see Pentti out of nowhere and said he was a Chinese student of his – worked for long periods at the Finland Futures Research Centre. In 1996 he took his doctorate under Pentti’s supervision with a dissertation entitled ‘Quantitative Analysis of Energy Consumption, Efficiency and Saving in the World, 1973–1990’.

In 1996, under an agreement signed with the Statistical Advisory Office of China, SIFE published statistical data on the Chinese economy under the title ‘China Quarterly Statistics’. These data were compiled and translated by Sun JiWu.

The SIFE project received funding from the Ministry of Trade and Industry during a number of years, and copies of all project publications were forwarded to the Ministry for distribution to companies. All in all the project produced a dozen or so studies, mostly in the area of international marketing.



A typical welcome discussion with the eldest host in Beijing in 1985.



Visits to China in 1985 and 1991 were hosted by Pentti's friend MaWenPu.



Pentti during a visit to China's largest steelworks in Shanghai in 1991.



Co-chairs Hao and Pentti at the Sino-Finnish Environmental Program seminar in China in 1996.



© Kimmo Ojaniemi

# PART IV

## FUTURES RESEARCH: ESTABLISHING THE FIELD AND CREATING NETWORKS



## 10. ACCOUNTS OF ENCOUNTERS WITH PENTTI MALASKA

## **Pentti Malaska - a man always ahead of his time**

*Ilkka Virtanen*

If anyone perfectly fits the description of a man always ahead of his time, it must be Pentti Malaska. This was clear to me and to other students of his from very early on, and therefore we decided to put together a commemorative book, exceptionally, on the occasion of his 40th birthday. Ten years later, on his 50th birthday, we did the same. When Pentti was approaching his 60th birthday in 1994, it was clear we needed to come up with something different. Eventually it was decided that we would extend our greetings to Pentti in a collection of video recordings and letters. I myself chose to write a letter. However, our project never materialized, at least in the format we had planned. Pentti therefore never received my letter.

This continued to weigh on my mind for quite some while, but 15 years later I had the opportunity to rectify the omission. In 2009, Pentti received an award from the Finnish Cultural Foundation that he greatly appreciated. To celebrate the award, he arranged a small reception at his home, and I was delighted and honoured to have been invited. I had a facsimile prepared of my letter, which I now handed to Pentti as a token of my congratulations for this notable recognition. The words and ideas I had written down in the letter 15 years earlier were still current at the time. And because I very much feel they are still current today, my letter from 1994 forms the bulk of my tribute here.

Professor Pentti Malaska

Turku, Helsinki and the globe

60 years 11 April 1994

Vaasa, Easter Monday 1994

Dear Brother Pentti,

Popular wisdom teaches us that there is only one way to live longer: you have to grow older and have birthdays. Children love their birthdays because they bring friends, parties, presents. In youth, the succession of birthdays becomes part of the transition into adulthood. Every year, young people gain new civic rights, as well as new duties and responsibilities. In adulthood, birthdays are hardly noted at all beyond the closest family circle. In mature age, things change again. Milestone birthdays are particularly interesting and important for people and interest groups closest to the birthday boy.

For you, Pentti, reaching a milestone age is not an event you want to make a big fuss about. But there are many of us within your circle of influence who do want to highlight the great significance that your being there among our circle of friends and colleagues has had and continues to have on our lives. The Finnish way is not to blow one's trumpet even about personal relations that have had importance to one's own life cycle; instead these are matters that are left for occasions such as birthday speeches. I'm sure that against this background you will understand that we have been highly motivated to put together this collection of letters.

When we were discussing a suitable motto for this collection, one idea stood out above all others: 'Pentti Malaska – a man always ahead of his time'. We know it's not your thing to go skiing on well-groomed tracks with loads of tourists. Your preference is to go deep into untouched wilderness, to carve out your own track in deep, pristine snow (though I do sometimes wonder whether it's really necessary to do this in the hardest way possible, on the steepest ascent and in a freezing blizzard). Yet without exception you always manage to find the most interesting terrain and routes, and soon there will be masses following your lead. I've always been in the fortunate position of being able to follow your adventures at close quarters, either as a member of your expedition or in some other capacity.

Your 1960s doctoral dissertation, which provided an analysis and projection of electrical energy consumption in Finland, was one of the pioneering works of time series analysis in our country, representing a significant rival and complement to econometric models. The model you developed in this work also proved to be a useful tool for teaching purposes. The inclusion of both deterministic and sto-

chastic component processes in your time series was clear and (in simplified form) straightforward enough to be incorporated even in the basic economics curriculum. Time series analysis has of course since then become one of the mainstays of empirical statistics. The ARMA and ARIMA models developed by Box and Jenkins and the powerful computer software created on their basis have subsequently made time series analysis accessible to all scientists. It was easy for me to take onboard these methods in my own work, too, as I had learned about the fundamental ideas of time series analysis through your research and teaching materials.

Doctoral training programmes have now become an integral and central part of Finnish academia. And that's excellent because for far too long, progress to the doctorate was via what's known as the 'Iisalmi model', where researchers were given a subject to pursue by their professor or where they came up with a subject themselves and then withdrew into their chambers to research that subject in the manner they best saw fit, often without any real outside guidance. The latter half of the previous decade saw the arrival of doctoral and postgraduate training programmes, both university-level and national, in Finnish universities.

There is, then, a historical sense to my having been part of one of the very first systematic doctoral training programmes that you launched at the Turku School of Economics in the early 1970s. Not only was the programme among the first in its field, it was also progressive and open-minded: it had a multidisciplinary orientation, with teachers and students coming from many different universities, and from the outset it placed great emphasis on publishing and international exchange. The programme became very broad and comprehensive in its coverage. It comprised both work and pleasure. Excursions and their scientific and social programmes were a key part of it all. I'm proud to be able to say that I'm a product of this doctoral programme, even though formally I earned my doctorate from the University of Turku. The programme has left a very clear mark on my subsequent research work. Throughout the 1970s, at least, that programme can be equated with you.

Expressed in mathematical terms, you have never shown very much interest in local minimums or maximums, you have always aimed at the global optimum. Global thinking, an interest in global problems and shifting the focus from the present day to the long-term future have made you a global citizen, a member of the Club of Rome, a leading figure of global futures research societies. All of this stems from a period just a couple of decades ago when the issues you raised were not yet considered important, they were not fashionable and they carried no real political weight. But for you, the only relevant angle has been that of a research scholar, a philosopher. It's been quite amazing to see you sketch on a paper napkin

the very first flowcharts of natural resource circulation, human activity and its consequences, which have then later re-appeared in major research treatises and global commentaries.

When three months ago I myself turned 50, I was asked in newspaper interviews and other contexts to describe my academic career. What has driven this working-class kid, the family's first matriculated son, to become a professor: ambition, hard-headed determination, or what? In my own mind there's no question: it's all been down to a disciplined attitude to studying and working at different stages of my life as well as to fortunate coincidence. There were two sides to the fortunate coincidence. In 1968, a position of assistant became vacant at the Turku School of Economics, and the previous office holder came knocking on my door and pretty much grabbed me by the scruff of my collar. Had I not been hijacked like this, I don't think I would have ever contemplated an academic career; I was thinking more along the lines of a job as an industrial mathematician. And I'm sure my academic career would have been very short-lived hadn't you, Pentti, been my future superior. The conditions had to be just right for me to be able to identify and to put to good use my scholarly talent. The general climate of postgraduate training, the research community that grew up and especially the relationship between you and me, the superior-subordinate relationship, the teacher-student relationship that evolved into a relationship of collegial friendship of complete trust – this was what ultimately decided the course of my life's work. Beyond this all I've had to do is put in the effort, and to always do my job to the best of my abilities.

I'm pleased that we continue to remain in such close contact after all these years. Recently a new dimension has been added to our relationship with our postgraduate students, whose work we are now supervising and reviewing together. I've been delighted to discover that in these key areas of our knowledge and expertise our views remain consistent. After my most recent life change in the summer – as I now imagine I will regain some say over what I want to do – I wonder whether we might once again start planning a joint expedition somewhere into terrain unknown, perhaps into knee-deep snow. Who knows, maybe one day.

My best wishes on your birthday. I wish you every happiness and success for the years and decades to come.

Yours,

*Ilkka*

As it turned out, Pentti was delighted to receive my letter, after so many years. A few weeks later, I received a warm letter of thanks from him which showed that we had indeed shared very similar experiences of the things I had mentioned in my own letter. I want to quote just one paragraph from Pentti's reply.

*So it was with great pleasure and appreciation that I received your letter at this time. You mention things whose value and significance I've only come to recognize in retrospect. The positive things that happened or that we accomplished in the 1970s, I feel we did all that together – more than with anyone else or on my own – complementing each other in some very profound and successful way. I believe this has always been a deeply mutual sense for both of us, and over our lifetime it has led us into new endeavours and achievements. We can be very pleased with the special issue of Futura and our article in that issue, which we hope will now reach a broader international audience. Every now and then I remind myself of Anatole France's aphorism: If you only want to accomplish great things rather than do something you can do right now, you might end up never accomplishing anything.*

In his letter Pentti refers to our close research collaboration that we rekindled in the 2000s. Our studies dealt with the methodological foundations of futures research, which we addressed under such headings as 'futures universes' and 'futures universum'. In other words, the wish I expressed on the last lines of my 1994 letter regarding new research collaborations had in fact materialized. Our joint commitment and efforts continued to bear fruit until the very end of Pentti's life, in my own thinking and in my own actions even beyond and up to the present day.



## Pentti Malaska's collaboration with philosophers

*Ilkka Niiniluoto*

*Based on an interview with and written by Laura Pouru.*

I first got to know Pentti in the early 1980s when he was looking for partners to establish a new discipline, futures studies. He was reaching out to philosophy because the challenge he faced was that this discipline had no recognized academic status and no existing institutions. Pentti and I shared a common interest in the philosophy of technology. Pentti had been studying the subject since the 1970s, and I had been working to develop the theme from the mid-1980s. Pentti was fascinated by such questions of principles, which he addressed from the standpoint of systems theory as well as against his engineering background.

The view prevailing at the time among traditional disciplines was that it is impossible to study the future because it does not de facto exist. Futures research was denounced as an exercise in making unfounded, unscientific prophecies. This was the prejudice Pentti was up against: he had to show that futures research was indeed a feasible, possible discipline. So it was against this background that Pentti reached out to philosophers, first the prestigious academicians of science Georg Henrik von Wright and Oiva Ketonen, followed by myself in my capacity as a young professor of theoretical philosophy. He was particularly keen to hear our views about knowing about the future. At Pentti's request I also contributed to consolidating the newly-established discipline by reviewing doctoral dissertations and docentship applicants before futures research had its own professorships. As well as working to build the philosophical foundations of futures research, Pentti was keen to demonstrate that exact methods were indeed available for knowing about the future, which came from his own background in engineering sciences and statistics.

Pentti also had a vision of making Finland the world leader in the field of futures studies – and made impressive progress towards achieving that vision. I think he took the right decision to start out by founding Finnish Society for Futures Studies in the early 1980s and by encouraging people from different disciplines to join in. Then, the Finland Futures Research Centre was established at the Turku School of Economics in 1992, and the first doctoral dissertations were completed the very same year. In 1998, ten Finnish universities joined forces to create a network known as the Finland Futures Academy (FFA), with Pentti taking the lead together with Olavi Borg. I was invited to join the Academy as representative



of the University of Helsinki, and in 1999–2004 I was Chairman of the FFA. Around the millennium there was a strong sense of change and transition around and therefore also much talk about the future. I was involved in organizing the 1999 Science Forum, which had the theme of ‘En Route to the Future’. There, I gave a talk on knowing about the future, which pleased both Pentti and Olavi. As the multidisciplinary audience of the Science Forum had now been introduced to this idea, Pentti and Olavi thought, this had served as an official endorsement of sorts to the new discipline.

I remember Pentti first and foremost for his diverse personality. On the one hand he was this happy-go-lucky boy from Karelia, but on the other hand he was a genuine cosmopolitan who could have an engaging discussion with any world-leading authority in any field. Indeed he was incredibly well networked with some highly influential figures around the world, which became clear when Finnish futures research began to develop its international relations and cooperation. For instance, when the World Futures Academy was founded in Finland, Pentti persuaded former Unesco Director-General Federico Mayor to assume chairmanship. As well as being an easy-to-approach and very friendly person, Pentti also had the ability to show dogged determination, especially when new programmes and structures were being created. That’s a combination with which you can achieve a great deal.

It is a truly momentous achievement to establish a new discipline out of nothing and to gain an academic status for that discipline. Without Pentti’s resolve and his skills of cooperation, the discipline of futures studies and its institutions would not exist on the scale they do in Finland today. I have no idea who would have undertaken such a venture had it not been Pentti.

## My encounters with Pentti Malaska

*Olavi Borg*

There are a few encounters that stand out in my memory. In 1986, the Finnish Society for Futures Studies hosted a summer seminar in Athens under the theme of Concept of Time. There were at least three of us senior participants: Pentti, Matti Vapaavuori and I. We shared a room with Pentti and in our few spare moments we'd wander off to see the sights of Athens. This gave us the chance to talk about all sort of things that didn't have to do with the seminar, including life's larger questions and even personal matters. At the time it was not yet clear where the Futures Research Centre was going to be based and indeed whether it would be integrated as part of the university system at all. It was not until 1989 that Professor Erik Allardt and his working group began their deliberations, and Parliament announced its decision in 1992.

At the University of Tampere there were some of us who wanted to see the new research centre brought to Tampere. Apart from myself I know that at least Professors Briitta Koskiahio and Risto Sänkiaho and at Tampere University of Technology Professors Jarl-Thure Eriksson and Klaus Kerppola expressed an interest. As the name of Pentti Malaska was an absolute drawcard for the project, I asked Pentti in Athens what he'd think about a move to Tampere if it so happened that the scales began to tip in our favour. Pentti chewed on the idea for a moment and then replied that he'd be willing to make the move – but only on condition that his name must not, under any circumstances, be mentioned in public, in other words we were not allowed to use this information in our lobbying efforts. I don't think that Pentti's commitment to the Turku School of Economics in the end was the decisive factor, but rather that Turku had already been doing futures research for some time under Pentti's direction, whereas the leadership at the University of Tampere showed only little interest. In particular, my own Faculty of Social Sciences showed a lukewarm attitude, even though the Ministry of Education had made it clear that it wanted to see the new discipline associated with a multidisciplinary university – which of course the School of Economics in Turku was not. Perhaps this secret pact between Pentti and myself can now be disclosed.

My fondest, almost idyllic memory from this trip is the slow ascent of us three seniors up the slopes of Mount Parnassus to see all of Delphi and its vineyards and its famous gorges. In the temple that once stood at the foot of Mount Parnassus, oracles intoxicated by herbal fumes delivered their prophecies for priests to interpret.

The 1980s was a period of intense contact-making and development for the new discipline. In my own field of political science we introduced two orientations, those of organizational research and futures studies. In the latter it was possible to earn up to 15 course credits. To this end we obviously had to provide lectures, especially on methodology. As Pentti himself just didn't have the time, he recommended Mika Mannermaa and Timo Sneck, who then duly arrived to teach methods courses. At the time the Finnish Society for Futures Studies was hugely instrumental in developing the new discipline as there still was no university network in place to provide support. Seminars hosted by the society provided an opportunity to meet like-minded colleagues from home and abroad. Pentti was often the most anticipated domestic speaker at these seminars.

The academic framework for the development of the new discipline began to take concrete shape in the 1990s. On 1 July 1991, the Ministry of Education announced its decision on the establishment of the Finland Futures Research Centre in connection with the Turku School of Economics. The centre later became an independent unit of the University of Turku in 2010, in line with Ministry's long-term ambitions to provide a multidisciplinary environment for the centre.

I had the pleasure of being involved in launching the so-called FUTU project in its early stages. At the time I happened to be a member of the Academy of Finland's multidisciplinary executive group for knowledge research, which was chaired by Professor Tapani Pakkanen. The Ministry of Education had pledged development funding for the discipline and even opened a call for applications – but it then turned out that the funds were not available after all. In a desperate effort to salvage the situation, the Ministry forwarded the applications to the Academy, which decided to process them under the research programme for knowledge research. Our executive group decided quite simply to give priority to these applications, which in fact was quite easy as most of them had been prepared under Pentti's supervision and were very strong applications. I remember how our chairman – Professor Pakkanen who was a chemist – would often say, should we open another tab of one million units for this project too! I was warmly in favour, while most other members on the group were usually silent. The FUTU project thus got off to a flying start, and indeed it produced among other things five doctoral dissertations. I myself was to receive one doctoral candidate in political science, Auli Keskinen, who earned her doctorate in 1999 and who by virtue of her multidisciplinary background holds docentships at various universities.

When the Finland Futures Academy was founded in 1998, Pentti invited me to join its executive committee. I agreed and even served as chairman of the board for a year. The last time I was in touch with Pentti was shortly before his passing:

I wanted him to check a few items in my article for a new edition of a methods textbook. And one final recollection: Towards the end of the first decade of the 2000s I was contacted by a member of the board of the Finnish Cultural Foundation, who wanted to know what I thought about the idea of granting Pentti an award for his lifetime achievements. I recommended it full-heartedly and said that I'd prepare a written statement if necessary. They did, of course, decide to give him the award. Apparently the time was finally ripe, but of course Pentti's own time was already nearing its end. The discipline was soon to lose its figurehead – and the rest of us to lose a great friend and colleague.



## Interaction and information technology

**Marja-Liisa Viherä**

*Based on an interview with and written by Laura Pouru.*

I first met Pentti in the early 1980s when my colleagues and I at Sonera were working on a project concerned with the challenges faced by ICT in the new millennium. Having struggled for some time to make any real progress, we decided we should turn to Pentti Malaska and ask his advice: he was already known at the time as a prominent futures researcher. There were three of us who went to Turku to meet him. What he said to me stuck: 'In a few years' time you will be giving talks on the subject of futures research.' This is exactly what happened, even though I would never have believed it at the time.

The 1982 Seili seminar proved to be a turning-point for the Finnish Society for Futures Studies and for me personally. The society had only just been founded, and the seminar gave it a huge initial boost to set it on its way, providing a solid foundation for its deep sense of community. Pentti was the soul and spirit of the event. He asked me to stand in for Tarja Cronberg and later on to chair a discussion. I was quite surprised by this at the time because I was a relative novice on the academic scene – and of course attitudes to women in those days were still rather different from what they are today. But Pentti never made any distinctions based on gender. And in hindsight I no longer think it was all that surprising that he asked me.

After the Seili seminar I joined the Finnish Society for Futures Studies and ever since have been actively involved. It's been a really important community for me where I have found a resonance to my ideas. Pentti, of course, played a major role in the society, too. When you look back at all that he achieved, I would argue that the Finnish Society for Futures Studies was almost more important than the Finland Futures Research Centre. FCFS is a scientific society founded by Pentti that contributed significantly to the establishment and recognition of futures research as an independent discipline. It was only later, through the FCFS, that the Finland Futures Research Centre was set up at the University of Turku, together with the professorships and Master's degree programme. Pentti was also instrumental in internationalizing Finnish futures research by creating international contacts among others through the Club of Rome and the World Futures Studies Foundation.

The research theme that brought Pentti and me together was the society of intangible needs. I was working for Sonera and my doctoral dissertation concerned the

role of humans in information society, specifically citizens' communications skills in civil society. My focus was very much on the society of intangible needs, as defined and envisioned by Pentti. My own view was and is more human-centred than Pentti's, concentrating more on people skills. It is pointless to consider new technologies if we do not consider whether people have the skills and abilities they need to use those technologies. For this reason I founded the Society for Communications Education, which runs summer camps for children and young people. Pentti often came to our camps, and his children and grandchildren have attended too. I like to think of our camps as growth platforms that provide an opportunity to learn the skills that are needed in interaction society of sustainable development. At the camps we produce our own newspaper, a TV programme and radio programme, prepare food and make money, etc. We have both old technology and new – for instance, we first had a 3D printer four years ago – but we sleep in tents. In other words, the principle is that we do everything together and that people of all different ages take part. It's a miniature model of a society of intangible needs.

Pentti was a very warm-hearted and supportive person. He was always there to lend you support. I personally would never have earned my doctorate had it not been for Pentti. He was also a great teacher, and always had tips and advice if you were nervous about having to give a talk in English, for instance. Also, Pentti would always side with the underdog. If you just did your best, that was good enough for Pentti. Pentti also appreciated the arts and himself enjoyed writing poems. He had great respect for all artistic endeavour; you didn't have to be someone famous. Pentti always enjoyed engaging in discussion, and his enthusiasm was contagious. However he wasn't only interested in the bigger picture and grand scheme of things, but also wanted to make futures research accessible to non-experts. Once at a summer seminar we were cooking future meals based on various scenarios, and Pentti, as usual, joined in with great enthusiasm. He was also very headstrong and followed his own path. The research themes he addressed were novel, and new territory is always a little bit scary. In questions of principle, Pentti was certainly not one to acquiesce easily.

## Spiritual growth as a counterbalance to economic growth

*Reijo Wilenius*

*Based on an interview with and written by Laura Pouru.*

Pentti contacted me in the 1970s when he wanted to discuss an idea about cultural revolution that I had put forward the previous year in a book of my mine. This was our first ever meeting and discussion, which as it turned out was to continue for the next 45 years. One of the subjects we covered was Rudolf Steiner's social thinking. Our views were largely consistent, even though Pentti's way of thinking was very different from mine: his was a mathematical way of thinking, while my thinking is best described as humanistic.

A few years previously, I had been involved in founding the Critical Academy (Kriittinen korkeakoulu), whose purpose was to address problems that do not usually appear on the university curriculum. We asked Pentti to join the Academy's board of directors. The Critical Academy was keen to find and recruit just such dissidents as Pentti was, and as apparently the rest of us were. We organized various types of events, including a weekly seminar at the University of Helsinki's main Porthania building, which attracted audiences of up to hundreds of people. At the time these kinds of critical institutions were mushrooming all over Europe, but ours is the only one that has survived to the present day.

One fundamental notion that Pentti and I had in common from the 1970s onwards concerned the spiritual growth of humans. I remember one occasion in sauna when Pentti began talking about his idea of human spiritual growth as a counterbalance to economic growth. This was to become one of our leading thoughts that was often discussed and debated at Critical Academy events. Professor of Theoretical Philosophy Oiva Ketonen and Academician Georg Henrik von Wright also showed an interest in these ideas. This was very much a movement of resistance against the tide of the times, when nothing else seemed to matter than economic growth and materialism.

We had a circle of friends amongst whom we often used discussed these spiritual issues. Apart from Pentti, the circle included Raimo Antikainen, who had studied medicine but who spent most of his time running his father's clothing company; social pedagogue Antti-Veikko Perheentupa, who served as an MP and Secretary-General for the Critical Academy; and Henri Broms, Adjunct Professor of Oriental Languages and Senior Librarian for the Helsinki University of Economics and Business Administration. We often met at Pentti's home and also spent



time at our summer retreat off the coast of Helsinki. We also shared trips at home and abroad. Strangely enough I cannot remember us ever having a single argument, even though we were all very different.

In our later years, when we were already getting older, we used to meet more or less once a week in a café overlooking the city centre. I talked a lot with Pentti. Sometimes we were joined by my son Markku and Henri Broms, but we spent much time just the two of us, until his illness started. I for my part at least benefited a great deal from our discussions.

What stands out in my memories of Pentti is his human warmth. There was a happy, Karelian directness about Pentti. And on the other hand he possessed a special sensitivity; he was a very emotional soul. He wrote and published poems. He also had a very strong emotional experience of nature. I imagine it must have been a huge burden for Pentti to first get involved in a nuclear power project and then to turn into one of its most outspoken critics, based on what he saw and learned about the safety and security of nuclear energy. His turnaround attracted a torrent of abuse from a broad front of people who were determined to crush him. However Pentti never complained, which was rather strange. He was just so modest by nature, but at the same time completely and absolutely honest and truthful.

Medicine has the honorary title of *archiatre*, the elder of the profession whose honesty is trusted. Pentti would have deserved to be appointed an *archiatre* of science. Talented scientists and researchers are usually self-centred and extremely sensitive about their honour, defending every single one of their opinions. Pentti, however, was completely open and interested in everything new, and he never felt the need to highlight himself. Very rarely have I seen such a wonderful character as his. I'm very pleased that my son Markku had the privilege of being his student.

## Pushing the epistemological boundaries of futures studies

*Ted Fuller*

I first met Pentti at World Futures Studies Federation conference in Brisbane in the late 1990s. Pentti was such a person that once you met him, it was impossible to forget him. Following our first meeting Pentti invited me to visit Turku for a couple of weeks, which I spent in the company of Markku and Sari and other members of what was then a relatively small, but very co-operative group. During my time in Finland I was introduced to the educational project Finland Futures Academy with multiple universities, which I found quite ground breaking.

I remember Pentti being always curious and always pushing the epistemological boundaries of futures studies. He was successful in convincing the Finnish Academy of the Academic Merits of futures studies and I always thought that his focus was on trying to strengthen the academic and philosophical base of the subject. As a person was Pentti open, friendly, curious, scholarly person – what all futurists should be.

Something important that I learned from Pentti was to be open and inclusive in the development of the field of futures studies, to encourage new thinking, to be assured of one's knowledge and fallibility. One of Pentti's phrases has stuck with me in particular: "Futures Knowledge, yes, but what kind of knowledge is that?"



## Collaboration through the Club of Rome

*Eleonora Barbieri Masini*

I met and got to know Pentti very well at all the meetings of the Club of Rome. The Club of Rome was founded by the Italian industrial manager Aurelio Peccei and Alexander King, mathematician and Director General of OECD, at a meeting at the Accademia dei Lincei in Rome on 7–8 April of 1968. I became a member of the Club of Rome a few years later. We collaborated very much through the years both in preparing conferences and in writing.

One special cooperation between Pentti and myself was in preparing an issue of *Futura*, volume 28/2009 on “Philosophical Essays of Knowledge of the Future” for which we were both guest editors. We were both interested in futures studies with a philosophical background. Pentti also added his interest in mathematical issues and I added my interest in sociological issues.

Pentti gave a great contribution to the development of the academic discipline of futures studies basing his research mainly on mathematics as he was basically a mathematician. He also wished very much to diffuse futures studies and hence wrote on the topic as well as encouraged meetings on futures studies related issues.

Pentti was a very gentle person always taking care of other people’s feelings and reactions and hence was never unkind. Also being a very studious person he was always glad to explain and clarify his thinking to all that contacted him. I myself got young people to contact him and he was always ready to help them in whatever they needed.

I personally learned very much from Pentti both from a human point of view as he was always ready to help young people in his areas of expertise as well as being willing to support colleagues like me in areas in which I was less expert than he was, such as mathematics. I always learned from Pentti but I specially learned from him how important it is to listen to people, especially younger people and support them.

I specially remember Pentti in two occasions. Once the first time I was invited to Turku he organized a short trip on a boat to show me the archipelago of Southern Finland. The second very nice occasion I remember about Pentti is when once he was in Rome for a meeting and he came to have a lunch at my home and we sat on my terrace talking about our interests in our work as well as a little about our families.

Pentti was indeed a very kind person, always ready to help as well as being greatly interested in his work for which he has been a great contributor. Indeed Pentti Malaska was and is a great person to remember.

## For the love of Pentti

*Jim Dator*

From 1975 until the bombing in 1991, the World Futures Studies Federation held an annual futures course at the InterUniversity Centre for PostGraduate Studies in Dubrovnik. I first met Pentti at one of those courses, probably in 1983 or 84, when he gave a lecture on the futures that was absolutely mind-blowing. It was one of the few truly futures-oriented lectures, based on his sophisticated and inspiring theory of social change that was ever given at the Centre. I saw that this was a person of tremendous intellect, who was also a warm, friendly, and droll person as well who was brilliantly able to combine mind and emotions extremely well in his presentations, and in his life.

I was Secretary General of the World Futures Studies Federation from 1983 until 1988 while Eleonora Masini was President. Communication between the two of us was not easy. We relied mainly on a weekly facsimile transmission from me to her (requiring each of us to go to a special place to send and receive it) followed by a very expensive one hour long phone call from me in Honolulu to her in Rome on Sunday morning/evening.

When I became President of the WFSF in 1988, Pentti became Secretary General, and it was a completely different story. Being in Finland, he had access to the very latest in electronic communication technology, and so did I in Hawaii – something new called “email”. Given our distance, I was sleeping when he was awake, and vice versa, so our daily email messages seemed instantaneous, making for vastly improved communication between the two of us – but perhaps putting many of the members of the WFSF without email then at a disadvantage since they had to continue to rely on snailmail. In order to be fair to everyone, this meant that formal decisionmaking for the WFSF had to remain tethered to this vastly slower mode of communication for a while.

One of the major projects of the WFSF at that time was an attempt to reconcile North and South Korea via the futures societies in both countries. Members of both the Korean Association for Futures Studies in South Korea and the Korean Academy for Social Sciences in North Korea attended the World Conferences of the WFSF in Budapest in 1990 and Barcelona in 1991. At the 1990 conference, Koreans from both organizations met and signed a document pledging the intention of holding a regional conference of the WFSF on the Korean peninsula, perhaps meeting first in Pyongyang and then traveling by train to Seoul. I visited

North Korea in 1989, and much of my time as President of the WFSF since then was spent trying to arrange such a meeting. When Pentti Malaska became President of the WFSE, and Tony Stevenson of Australia became Secretary General, following the World Conference in Turku in 1993, they continued to work with both KAFS and KASS until at least 1996 to arrange a joint meeting which ultimately never happened in spite a great deal of correspondence and a trip to Pyongyang by Pentti in 1991.

Pentti and his wife came to Hawaii twice, and each time Hawaii's normally lovely, sunny, balmy weather was overcast, rainy and cold (by Hawaii standards) the entire time they were here. They very politely said that it was OK: it was like a Finnish summer. It didn't seem fair to me that they should come halfway around the world to experience a Finnish summer, since all of my many visits to Finland had always been so very pleasant – if you like overcast skies with rain and snow, which I did since it was such a change from the incessantly lovely weather of Honolulu, except when they were visiting.

Though educated as an engineer, Pentti was a thoroughly warm-hearted humanist, visionary, activist, and poet, so I end my comments with one of my favorite poems of his, about time, published in a very unlikely source – European Journal of Operations Research.<sup>160</sup>

*Time flows to the present  
from two directions*

*from the past – as  
accomplished deeds  
and material manifestations,  
as can be perceived, and*

*from the future – as  
our aims, intentions and  
ideas as conceived.*

*At the present they mold  
together and  
form our reality.*

---

<sup>160</sup> European Journal of Operations Research, 1998, Vol. 37 (1), p.4.

# 11. FUTURES RESEARCH AS CREATOR OF MEANINGS

**Sirkka Heinonen**

*Futures research is an exercise in ascribing visionary meanings to things, attaching values to facts.<sup>161</sup>*

Pentti Malaska, the pioneer of Finnish futures research, died on the Ides of March, a date of historical importance in the Roman calendar. The news came as a surprise to our futures research community, even though Pentti was no longer a young man. Pentti was an energetic, perpetual motion kind of personality who never ceased to come up with new ideas. He lived an incredibly full life during which he created a whole new discipline in Finland in futures research.

His achievements both at home and internationally are extraordinarily diverse and far-reaching, as the earlier chapters in this biography have made clear. Pentti made an exceptionally significant contribution to science and research in the fields of energy technology and economy, to establishing the scientific foundations of operations research and futures studies, and to sustainable development. In what follows I describe Pentti as a pioneer of Finnish futures studies, a trailblazing buster of myths, a highly respected expert in his field, and a personal friend over a period of four decades. I first got to know Pentti through the Finnish Society for Futures Studies in 1980.

## **Guardian of the Club of Rome spirit**

Pentti was the first Finnish person ever to be invited to the Club of Rome (in 1972). He eventually became an honorary member. Pentti knew the founding members of the Club of Rome personally, and he had a very high regard for Aurelio Peccei, Italian industrialist who was known for his commitment to corporate social responsibility, and Alexander King, the Scottish scientist who served as Chairman of the Club of Rome in 1984–1989. I have a vivid memory of the Club of Rome's 40th anniversary conference which was held in Rome in 2008. Pentti had been invited to give a talk that he ended, most impressively, by reading one of his poems. This was the last Club of Rome conference Pentti was to attend. I re-

---

<sup>161</sup> Pentti's interview. Itä-Savo 20.7.1994 Olemme vaihtaneet harhoja. [We have changed our illusions.]



member as we were flying home, sitting on the same row but on opposite sides of the aisle, I asked Pentti a question about the concept of complexity. He launched into a lecture that lasted the whole flight, while I was trying to take notes the best I could. Complexity is of one of the most important and enduring themes of futures research. And all the while as he was giving this lecture, Pentti also found the time to amuse the small boy who was sitting on his other side, making funny faces at him.

In 2012, at an annual conference on Power of the Mind in Bucharest, Pentti's Romanian friend, author of the No Limits to Learning report Mircea Malitza, literally fell backwards on hearing the news about Pentti's passing. Pentti was held in high regard by many Club of Rome members who represented the club's original 'save-the-world' spirit, such as Sergei Kapitza, Eleonora Masini and Gunter Pauli. Pentti did feel that the Club's original message and agenda were watered down somewhat as time went by. Nonetheless Pentti's personal 'power of the mind' has clearly had a profound and lasting impact on many Club of Rome members. Systematic long-term futures thinking needs to be learned and internalized.

## **Bridge-building in the Finnish Society for Futures Studies**

Pentti was the first President of the Finnish Society for Futures Studies in 1980–1989, and he was also an honorary member. In 1990, he received the society's first ever Futures Award together with his research team, and later in 1998 he furthermore received a personal award. It was through this society that I initially got to know Pentti, at a time when I was involved in what was then the largest ever Finnish futures research project, coordinated by Juhani Kuusi at VTT Technical Research Centre of Finland. Pentti very much appreciated the efforts that we were making at VTT to develop futures research in Finland (Malaska 1985). VTT's then Director-General Pekka Jauho chaired the Academy of Finland's Futures subcommittee, whose backing to the need for a national society in this field was important to receiving the final go-ahead. My job at VTT was to see how futures studies were organized in other countries and to find out what methods and approaches were applied and what projects and institutions were active in the field. My own research interest soon turned the relationship between humans, technology and nature, the dynamics and problems within this relation. This theme tied in very closely with Pentti's research interests (see the description below of the FUTU project).

In 1985 the Finnish Society for Futures Studies had 350 members, at the time of writing that figure has doubled to more than 700. The society was and still

is of huge importance to Finnish futures studies. Pentti's efforts created a solid foundation and ethos for the society and its continuing expansion. When Pentti's presidency came to end, a delegation set out from Helsinki to collect the society's archives. Pentti was followed as President by VTT Research Professor Torsti Kivistö, and I took over from Anita Rubin as Secretary General. On a dark and stormy November night, Torsti and I drove down to Turku, in deep conversation about various matters having to do with futures studies. Pentti and Anita just had to wait us out; this was before the age of mobile phones. The actual 'changing of the guard' involved Pentti and Anita handing over to us the society's files and archives in brown cardboard boxes. They both remained active in the society in various ways. The society, for its part, has organized Pentti Malaska seminars in 2013 and 2015 to commemorate his work and to carry forward his legacy in the field of futures studies. I have also had the pleasure of walking in Pentti's boots in the capacity of President in 2012–2015 and Vice President since 2017. The society's seminars, other events and publications propagate Pentti's idea of the society of intangible needs on two fronts, both through scientific and civic activity.

### **Finland Futures Research Centre and Finland Futures Academy - a fruitful mix of research and education**

The founding of the Finland Futures Research Centre as an independent unit associated with the Turku School of Economics in 1992 was, again, in large part a personal achievement of Pentti's. He worked tirelessly to promote the idea that futures research is a discipline in its own right. In 2013, the Centre was finally granted permission to organize its own international Master's degree programme, which means that graduating students are awarded the academic title of Master of Futures Studies. It is now possible to obtain a doctorate in futures studies as well. Pentti and his research themes have a constant and indeed topical presence in my study courses for Master's students who come from more than 25 different countries. In the autumn before his passing, I invited Pentti to visit the University of Turku and our international Master's programme. All my students were deeply impressed by the opportunity to meet the pioneer and founding father of futures research and training in futures research in Finland. Pentti never tired of stressing the importance of learning the scientific and philosophical foundations of the discipline and the great significance of basic research. The Futura theme issue<sup>162</sup> he edited with Eleonora Masini on knowing about the future will remain on interested learners' reading lists for a long time to come, and I myself continue to use

---

<sup>162</sup> Malaska, P. & Masini, E. (2009) *Philosophical Essays of Knowledge of the Future*. Futura 1/2009.

it as compulsory reading for my students.

Pentti was also instrumental in founding the national Finland Futures Academy (FFA) in 1998. He served as the first Chairman of the Academy's international advisory board. Pentti wanted to see the corresponding Turku-based World Futures Academy upgraded to the international level, and he strongly advocated for me to organize this, obviously in close collaboration with FFA. I have not been in the position to contribute to these efforts, but the UNESCO Chair awarded in 2016 to Professor Markku Wilenius at the University of Turku has moved us in this direction.

I am currently serving as professor of future studies and Director of the Helsinki Office of the Finland Futures Research Centre. Here, we have at our disposal all of Pentti's written works about futures studies as well as an archive of interviews with and newspaper articles about Pentti, which have been kindly donated to us by Pentti's wife Karin Holstius. Much of this material has been used for the present biography, and in the future it will be accessible for students working on their theses, for example.

At the Finland Futures Research Centre, Pentti regarded as one of his major achievements the FUTU research project (Citizenship and Ecomodernisation in the Information Society. Futures Approach). Funded by the Academy of Finland, FUTU produced five doctoral dissertations in futures studies: Marja-Liisa Viherä<sup>163</sup>, Auli Keskinen,<sup>164</sup> Sirkka Heinonen,<sup>165</sup> Anita Rubin<sup>166</sup> and Jari Kaivo-oja<sup>167</sup>. At the doctoral seminars organized under the umbrella of this project, all of us were able to benefit from Pentti's guidance and supervision. Other experts obviously contributed as well, including Matti Kamppinen, Pekka Jokinen and Juha Nurmela, not to mention Markku Wilenius in his shepherding and coordinating

---

<sup>163</sup> Viherä, M-L. (1999) Ihminen tietoyhteiskunnassa. Kansalaisten viestintävalmiudet kansalaisyhteiskunnan mahdollistajana. [Humans in information society. Citizens' communications skills as facilitators of civic society.] Turun kauppakorkeakoulun julkaisuja, Sarja A-1: 1999. Turku.

<sup>164</sup> Keskinen, A. (1999) Towards User Empowerment. On Development of Utilization of Information and Communications Technology in Decision Making of Administrations. *Studia Politica Tamperensis* No.6. University of Tampere, Tampere.

<sup>165</sup> Heinonen, S. (2000) Prometheus Revisited – Human Interaction with Nature through Technology in Seneca. *Commentationes Humanarum Litterarum* 115. *Societas Scientiarum Fennica*. Helsinki.

<sup>166</sup> Rubin, A. (2000) Growing Up in Social Transition: In Search of a Late Modern Identity. *Annales Universitatis Turkuensis*. Ser. B. Tom. 234. *Humaniora*. University of Turku, Turku.

<sup>167</sup> Kaivo-oja, J. (2004) Analyses of Historical and Future Problems of Sustainable Development: Research Articles in Spatial Sustainability Analysis, Planning and Evaluation. *Acta Universitatis Tamperensis* 1038, University of Tampere. Tampereen yliopistopaino Oy Juvenes Print, Tampere.

role. Markku was also finalizing his own doctoral dissertation.<sup>168</sup> This project allowed me to take time off from my full-time job at VTT and concentrate on this unique and hugely interesting project. Pentti encouraged me to elaborate on the history of ideas section of my dissertation and to incorporate in this section my indicators of sustainable development in information society and so to create a bridge from thinking in antiquity through to future society. All of us on the project also had the opportunity to meet Manuel Castells, who was writing in Turku on the network society, and Hungarian systems theorist and classical pianist Ervin Laszlo, and to introduce our own projects to both these gentlemen. At a conference in Reykjavik, Iceland, we had the privilege of meeting Wendell Bell, author of *Foundations of Futures Studies*. At the conference's evening dinner, Pentti gave his legendary long talk on the outlook for human development at the threshold of the age of cyborgs. Pentti reminded us that 'humans are nothing without their technology'. The key question, however, is whether humans with their technology are something better from the point of nature, the world and future. In the wrong hands, 'technology is nothing more than a swelling future deficit which will ultimately damage the human nature relationship'. Indeed, Pentti's motto was 'Nature will always win, whether with or without humans', and he challenged everyone to consider whether the world was a better place by virtue of humans.

## **Society of intangible needs consists of international networks**

Pentti continued to remain actively involved in international networks, including the Club of Rome and the World Futures Studies Federation (WFSF), until the very end of his life. Pentti served as Secretary-General of the WSFS in 1990–1993 and as Chairman in 1993–1997. Following his passing there was a huge influx of letters of condolence. Pentti has indelibly influenced the minds and hearts of countless people around the world. One event that is especially remembered the world over is the WFSF conference on 'Chaos and Coherence', which was organized under Pentti's chairmanship in Turku in 1993. I myself had the honour to participate in planning and organizing this conference in my capacity as Secretary General of the Finnish Society for Futures Studies. A couple of years ago I met an Indian scholar who had attended this conference and who said it had been the best WFSF conference ever. Pentti's chairmanship of the WFSF put Finland on the world map of futures research with much greater intensity than before.

---

<sup>168</sup> Wilenius, M. (1997) *Faust on Wheels. Conceptualizing Modernization and Global Climate Change*. The Finnish Society of Sciences and Letters and The Finnish Academy of Science and Letters. Helsinki.

Another global network project in futures research that was very close to Pentti's heart was the Millennium Project. He closely followed the work of Jerome Glenn and his colleagues and often engaged in e-mail exchanges with various node members about specific futures studies issues. Paul Werbos, energy expert for the US government agency National Science Foundation, still remembers Pentti's sometimes radical views on energy issues that were clearly ahead of their time.

## **From neo-growth to neo-carbon world**

Pentti introduced the business world to systems thinking, the model of visionary management and the concept of neo-growth. Throughout his research career Pentti was adamant that the root cause of society's problems lay in the model of linear economic growth. Realizing the difficulties of selling this notion on the basis of a degrowth model, Pentti came upon the idea of deconstructing the myth of linear growth and advocating instead a model of neo-growth<sup>169</sup>. Neo-growth is in essence a pattern of socially just growth that does not waste natural resources or non-renewable energy sources. On one occasion Pentti surreptitiously asked me what I thought about this idea, and I straightaway encouraged him to develop it further. Pentti never finished this work, but the notion remains a strong pillar for instance in the future section of my Neo-Carbon Energy project, where I wanted to elevate Pentti's concept of neo-growth into a key theme of social transition. Funded by the Finnish Funding Agency for Innovation Tekes, this project has outlined four transformative scenarios in which we are exploring the model of a neo-carbon world as facilitated by neo-growth. Ultimately the project will be aiming to develop an energy system in which a significant proportion, up to 100% of total energy is produced from solar and wind sources and stored in synthetic natural gas. The system would be CO<sub>2</sub> neutral. CO<sub>2</sub> circulation within the electrical energy system can be closed, and transport and industry emissions can be rebound by using carbon dioxide from the atmosphere as a source of carbon. Synthetic natural gas can be distributed via the existing gas grid. An energy system based on wind, solar power and synthetic natural gas is decentralized, which changes the energy market and opens up opportunities for new business models and value chains. The role of the Finland Futures Research Centre is to forecast the economic and social effects of the new energy system under the Malaskan paradigm of neo-growth.

Neo-growth (as opposed to degrowth) not only invokes positive associations, but also redefines growth. The key fundamental requirement is that all growth must be ecologically sustainable: more and better must be produced out of less. New sources of growth include the immaterial economy, but especially barter and social

---

<sup>169</sup> Malaska, P. (2010) Uuskasvusta. [Neo-growth.] TeliaSonera. Helsinki.

production. Economic and human growth are closely intertwined in the model of neo-growth. Rifkin's ongoing third (or Germany's fourth) industrial revolution provides a great opportunity for the creation of neo-growth. The old fossil-based energy system is, quite literally, an old fossil. Old production is discarded but at once replaced by new production.

The role of futures research, according to Pentti, is to create foresight and visionary knowledge, to ascribe meanings to things and to attach values to acts and actions. The problem is that *'we are living in the same world but in different realities'*. Neo-growth combines all three elements: foresight, significance, and value-based action.

## **The new human understands the necessity of neo-growth**

Neo-growth will only be able to succeed if humans themselves can change and rid themselves of the collective delusion. The biggest challenge that lies ahead is the development of humanity. The inner growth of humans will provide a new kind of vision for all other growth as well. Pentti was an inspiring speaker and prolific writer who was committed to popularizing science. He was absolutely uncompromising in his advocacy of value rationality, natural technology and limits-to-growth thinking, and the inner development of humans. More than 30 years ago, in one of his countless newspaper interviews, Pentti was keen to highlight the values underlying human activity:

*'The idea of inner and mental order, for me, means that individuals begin to reflect upon their own values, the values that underlie their very existence as human creatures.'*

Pentti was intrigued by the essence and evolution of human beings. Flechtheim's ideal of an ethically conscious and responsible Homo Humanus, Pentti said, appeared to be *'a particularly human-like human! Apparently the new human being is in some way an improvement on the current one.'* The more advanced version of the organic human, Homo Humanus, is accompanied by another type of human, Homo Artefact. This human is a creation of technology, which *'according to the transhumanistic conception will replace the organic human over the next few decades – Cyborgs and Chimera-type creatures will take over and assume power'*<sup>170</sup>. It is possible that these types of humans will eventually be thrust into an existential battle.

Values are what make humans human. Values also provide the basis on which we create images of the future. In Pentti's view *'utopias and dystopias both point at the goal-directed existence of humans and provide means for future studies to describe fu-*

---

<sup>170</sup> Pentti's e-mail to the author 11 October 2011.

ture expectations. They are important elements that help expand human thinking and imagination as well as our futures consciousness, within our futures culture.’ Apart from futures thinking and futures consciousness, Pentti also talked about a specific futures culture and the role of culture in creating futures. The forces that historically have furthered positive trends in development, Pentti maintained, have always been cultural forces: ‘Cultural forces are carrier waves that have decisive significance especially in times of transition’<sup>171</sup>. Never one to shy away from fast-moving dangers, Pentti had this answer to the question about the potential threats we face in the future, asked by active member of the Finnish Society for Futures Studies, Auvo Sarmanto:

*The only future threat we face is our own ignorance: there’s nothing we can do about what’s inevitable, but ignorance prevents us from recognizing this and on the other hand from doing what we could do to prevent what is preventable, or from doing what we could accomplish. For this reason and this reason only – to dispel ignorance – futures research has a legitimate place.*<sup>172</sup>

## In conclusion

Among the areas and issues that were particularly close to Pentti’s heart in his last years were the promotion of futures consciousness and planetary consciousness. He was a rare combination of scientist and artist – an influential civic activist and inspiring business coach. As a person, scholar and teacher he was an endless source of knowledge and wisdom, a profound thinker, a reliable and trustworthy uomo universale with a wonderful sense of humour – a true intellectual giant. For me personally, Pentti was an excellent teacher, a visionary leader, a colleague I always looked up to, a close and dear friend. In my own research, in my own teaching work in the futures research Master’s degree programme and in the futures research community, I am committed to follow up and develop many of Pentti’s theses and ideas. He set me a personal mission that I hold close to my heart: *‘As you’re already familiar with the world of antiquity, you should get to learn more about Maya and Aztec civilizations!’*

---

<sup>171</sup> Pentti’s interview. Itä-Savo 20.7.1994 Olemme vaihtaneet harhoja. [We have changed our illusions.]

<sup>172</sup> Finnish Society for Futures Research local email posting group 16 February 2010.

With quite some pathos, but with equal conviction, I wrote a eulogy for Pentti in the first issue of Futura, the journal of the Finnish Society for Futures Studies in 2013, which had the following lines:

‘The great eternal tree of futures research, Pentti Malaska, has fallen. But Pentti Malaska will live in our memory forever!’





Pentti, Reijo Wilenius and Antti-Veikko Perheentupa philosophizing on the banks of river Kemijoki in spring 1976.



Pentti and students from Pakistan and Kenya at a WFSF futures research course in Andorra in May 1993.



Timeout at a WFSF summer seminar in St. Petersburg in June 1995.



Principal organizers of 1995 WFSF conference in Nairobi, Kenya  
(from left to right): H. Odera Oruka, Gilbert Ogutu and Pentti Malaska.



Pentti and Desmond Tutu in discussion at the 1995 WFSF conference in Nairobi.



Pentti and other members of staff from the Finland Futures Research Centre at an office warming party at ElectroCity, Turku, in 1997. From left to right in the back row: JiWu Sun, Kimmo Vuori, Matti Kamppinen, Anne Arvonen, Jari Kaivo-oja and Tarja Meristö; and in the front: Anita Rubin, Pentti, Päivi Salonen and Markku Wilenius.



Pentti and the rest of the Finnish delegation stop off in Thailand en route to the 1997 WFSF conference in Brisbane, Australia. From left to right in the back row: Markku Sotarauta, Pentti and Markku Wilenius; and in the front: Vuokko Jarva, Krista Loogma, Matti Kamppinen, Mari Walls, Kuutti Kamppinen, Anita Rubin, Marja-Liisa Viherä and Juha Nurmela.



First international advisory board of the Finland Futures Academy in Turku in 2002: Jerome Glenn, Federico Mayor, Eleonora Barbieri Masini, Ted Fuller, Réka Várnagy, Kerstin Cuhls, Osmo Kuusi, Lars Rydén, Igor Bestuzhev-Lada and (in the front) Pentti.



The 10<sup>th</sup> anniversary celebrations of the Finland Futures Research Centre in 2002.  
In the back row: Tuomo Kuosa, Pauli Saloranta, Olli Hietanen, JiWu Sun, Petri Tapio,  
Markus Vinnari, Jyrki Luukkanen and Jari Kaivo-oja.  
In the middle: Aleksi Neuvonen, Ira Ahokas, Anna Kaivosaaari, Karoliina Lehtinen,  
Anne Arvonen, Ene Härkönen, Hanna-Kaisa Aalto, Päivi Salonen, Martin  
Lehmann-Chadha, Timo Nurmi, Matti Kamppinen, Markku Wilenius and Pentti.  
In the front: Jarmo Vehmas, Anna Kirveennummi, Anne-Mari Vilola, Sari Söderlund,  
Katriina Siivonen, Merja Otronen, Auli Keskinen and Anita Rubin.



Second international advisory board of the Finland Futures Academy at Suomenlinna, Helsinki, in October 2004. From left to right in the back: Osmo Kuusi, Juha Kaskinen, Jerome Glenn, Michael Keenan, Sari Söderlund and Mati Heidmets; and in the front: Karlheinz Steinmüller, Erzsébet Nováky, Pentti and Eleonora Barbieri Masini.



Researchers from the Citizenship and Ecomodernization in Information Society project meet at Pentti's home in Oulunkylä, Helsinki in 2008. From left to right in the back: Jari Kaivo-oja and Hannu Linturi; in the front: Pentti, Sirkka Heinonen, Marja-Liisa Viherä, Anita Rubin, Juha Nurmela and Markku Wilenius.



© Kimmo Ojaniemi

OSA V

COLLECTION OF POEMS  
WRITTEN BY  
PENTTI MALASKA



*There is no time, passing  
any longer,  
in linear order*

*There is no time,  
perpetuating,  
in cyclic order*

*The time bifurcated  
to chaos time,  
not passing,  
not perpetuating,  
but bewildering  
by its strange orders*

– Pentti Malaska

*Blind evolution  
in a never-ending present without a future  
made us into creatures different from all others,  
capable of learning.*

*We conquered the planet,  
turned it into our lebensraum,  
Which made us different from all others.*

*Will we continue blind,  
in a never-ending present,  
or will we take responsibility for the future of the planet  
together with others?*

*There lies the conflict of becoming a human.*

– Pentti Malaska

ODE TO THE FUTURE

*The future is dancing in front of us  
its seductive dance of the seven veils  
– that never started and never ends –  
holding our mind in its spell.*

*Teasingly it strips off its veils  
– the joy and inspiration, hope and despair,  
work and faith and the happiness and horror of memories –  
and throws them upon us  
so that it never discloses itself.*

*Flirtingly it reveals a fleeting moment:  
this is how I could be, might be,  
and invites us to join it in its play that our mind cannot resist.*

– Pentti Malaska

*THE POWER OF ETHICAL SELF-AWARENESS*

*The mission of a human being  
is not to confirm  
his or her own existence,  
because it  
doesn't necessarily mean anything really essential.*

*The mission of a human being  
is not to secure life,  
because life has its own means of  
taking care of itself.*

*Life wins,  
whatever we do.*

*Life wins,  
either with humans, or  
without.*

*The mission of a human being is to prove  
that human life  
is a valuable part of life in general;  
that life  
is richer and more precious  
with humans than  
without.*

*Making life full of dignity  
and worth experiencing  
requires special human quality, it means  
the awakening of ethical self-awareness.*

*The power of self-knowledge!  
It raised up some,  
some even above the ground.*

*But those who were left on all fours  
did not approve.*

– Pentti Malaska

*The technosystem needs not only  
natural resources, it needs them in a  
very specific quality,  
very specific form,  
very specific quantity,  
at a specific moment in time,  
at a specific place,  
at a specific price, and  
in a specific combination.*

*This need is satisfied through productive activity.*

*In satisfying this technosystemic need humans  
break down the natural flow of matter, energy and information  
as well as related other opportunities to humans themselves  
and to other nature  
and  
fill the space and time of nature with their own impacts  
and emissions of matter and energy to which nature  
has to adapt.*

– Pentti Malaska

*THE EARTH IS FINITE*

*It is not surprising that growth continues  
even though the earth is finite.*

*Most people, rich or poor,  
see expansion and growing more  
as the only  
imaginable solution to their real and  
immediate desires  
even though the earth is finite.*

*In the world of riches, growing more appears to be  
the way of life necessary for employment, status,  
paying back anticipated growth some day,  
and for development  
defined solely by things and matter  
even though the earth is finite.*

*In the world of poor, growing more seems the only way  
out of poverty and despair, and  
having children not only as a source of joy and love,  
but as a thing of trade  
even though the earth is finite.*

*Until other thoughts than growing more  
are found to remedy  
the problems encountered,  
the people will not give up their hopes and desires  
invested in the idea of growth  
even though the earth is finite.*

*But the earth is finite.*

– Pentti Malaska

*LIKE A BREEZE OF WIND*

*Like a breeze of wind  
in a misty cloud  
Are our experiences and thoughts  
in the world  
as they create reality.*

– Pentti Malaska

*THE EYE OF GAIA IS UPON US*

*The role of humans  
is not to ensure their own  
reductiveness.  
That would have  
no essential meaning.*

*Neither is the role of humans  
to secure life because  
Life will look after itself,  
even without humans,  
as it has done for billions of years.*

*Life will always win  
no matter what humans do.  
It's just a matter of whether  
humans will win with life.*

*The role of humans is to show  
that it is possible to  
win with humans,  
that human life is a valuable part of life as a whole,  
that life with humans is richer and more valuable  
than without humans.*

*Making life valuable and  
experiencing it as such  
requires of humans a special quality,  
it requires an awakening to an ethical consciousness of the world.*

*The power of consciousness in the universe!  
Some it raised upright,  
others it raised up off the ground.  
But those who still remained on all fours,  
didn't like it.*

– Pentti Malaska



## ENLIGHTENMENT

*I own an island  
on a lake  
beautiful to enjoy the summer.*

*Oh how I like that,  
all mine*

*An island  
whereon to meditate  
by the whispering of waves  
on the shore*

*They come and go  
so very gently, very silently  
the waves  
they come and go,*

*whispering:  
we've done that same  
for a hundred years  
thousand years,  
no, ten thousand years  
and more*

*and whispering again:  
we'll be doing that same  
still for a hundred years  
thousand years,  
no, ten thousand years  
and more*

*They come and go  
so very gently, very silently  
the waves  
on the shore of my own  
and still whispering:  
where were you then,*

*where will you be  
in ten thousand years  
and more*

*Waves,  
they come and go  
so very gently, very silently  
they come and go  
into my meditation  
into my soul  
on the shore of the island  
mine owned*

*Very gently, very silently  
reaching nothingness  
that can be  
they are whispering  
inside me:*

*Won't you wonder  
who owns thee*

– Pentti Malaska



# REFERENCES

## **To the Reader**

Matilainen, P. (2016) Muutoksen tekijät. Renessanssin synty ja perintö. [Change makers. The birth and heritage of the Renaissance.] Ateena, Jyväskylä.

## **Chapter 1. An introduction to the thinking of Pentti Malaska**

Lemma, A. & Malaska, P. (1989) Africa Beyond Famine – A Report to the Club of Rome. Tycooly Publishing, London.

Wilenius, M. & Kurki, S. (2012) Surfing the Sixth Wave. Exploring the next 40 years of global change. FFRC eBook 10/2012.

World Values Survey, [www.worldvaluessurvey.org](http://www.worldvaluessurvey.org), accessed 18.1.2016.

## **Chapter 2. Recollections of Pentti's life and his growth into a thinker**

Ernst, B. (1992) Optical Illusions – The Eye Beguiled. Benedikt/Verlag GmbH.

IBM Katsaus (4/1992) Pentti Malaska – Two decades at the Club of Rome.

Jung, C. G. (1964) SYMBOLIT – Piilotajunnan kieli. [Man and his Symbols.] Otava, Helsinki.

Kaitaro, T. & Roinila, M. (2004) Filosofin kuolema. [Death of the philosopher.] Summa, Helsinki.

Kiinteistölehti (3/2000) Businessvaltio jyrää – Kansalaisliikkeet vastapainoksi. [Business state goes from strength to strength – Civic movements to provide counterbalance.]

Malaska, P. (2006) Yhä uusiin vieraisiin paikkoihin piti sopeutua. [Always adapting to new places.] In: Kuorsalo, A. & Saloranta, I. (toim.) Evakkotie. [The road to evacuation.] Ajatuskirjat, Helsinki.

Malaska, P. (1979) Avoimet ja sumeat systeemit. [Open and fuzzy systems.] Weilin+Göös, Helsinki.

Paakkola, E. – Turunen, K. & Kaitaharju, T. (2003) Toisin tietäminen. Tapio Kaitaharju 80 v. [Knowing differently. Tapio Kaitaharju 80 years.] Arator Oy, Helsinki.

Seura (1984) Miksi ihmiset eivät välitä omista aivoistaan. [Why people don't care about their own brains.]

Suomen Kuvalehti 3.9.1999 (article title unknown), 20–21.

Taikasilmä – uusi tapa katsoa maailmaa, kolmiulotteisia kuvia [The magic eye – a new way of viewing the world, 3D images.] (1994) WSOY, Helsinki.

Tammenlastuja (1/2009) Pentti Malaska – Ennalta näkijä, edellä kulkija. [Pentti Malaska – A visionary and forerunner.]

Tekniikka Elämää Palvelemaan -julkaisu (1980-luku), 14–25. [Technology for Life publication (1980s).]

Tiede (4/2016) Huijaa aivojasi. [Cheat your brain.]

Visual Illusions (2004) Tobar Ltd, Iso-Britannia.

### **Chapter 3. Futures consciousness and knowledge of the future**

Bell, W. (1997) Foundations of Futures Studies: Human Science for a New Era. Vol. 1, History, Purposes, and Knowledge. Transaction Publishers, New Brunswick and London.

Bronowski, J. (1974) The Ascent of Man. Little, Brown; Boston.

Coppens, Y. (1995) Brain, locomotion, diet, and culture: how a primate, by chance, became a man. In: Changeux, J-P. & Chavaille, J (eds.) Origin of the Human Brain: a Fyssen Foundation Symposium. Published in Symposia of the Fyssen Foundation. Clarendon Press, Oxford.

EFMN (2012) European Foresight Monitoring Network. [www.efmn.info](http://www.efmn.info), accessed 5.4.2012.

Eisler, R. (1987) The Chalice and the Blade. Our History, Our Future. Harper Row, San Francisco.

Everding, G. (2007) Imaging pinpoints brain regions that 'see the future'. Memory and future thought go 'hand in hand'. Washington University in St. Louis News & Information. <http://news.wustl.edu/news/Pages/8448.aspx>, accessed 5.4.2012.

Flechtheim, O. K. (1966) *History and Futurology*. A. Hain, Meisenheim am Glan.

Glenn, J. C. – Gordon, T. J. & Florescu, E. (2011) *State of the Future 2011*. Millennium project, Washington D.C.

Heidegger, M. (1993) *The Question Concerning Technology*. In: Krell, D. F. (ed.) *Martin Heidegger: Basic writings: From Being and time (1927) to The task of thinking (1964)*, 307–342. HarperSanFrancisco, San Fransisco.

Heinonen, S. – Kuusi, O. & Salminen, H. (eds.) (2017) *How Do We Explore Our Futures? Methods of Futures Research*. Acta Futura Fennica 10. The Finnish Society for Futures Studies, Helsinki.

Jouvenel, B. de (1967) *The Art of Conjecture*. Basic Books, London.

Kubrick, S. (2001) *The Space Odyssey explained*. [www.kubrick2001.com](http://www.kubrick2001.com), accessed 5.4.2012.

Kubrick, S. (1968) *2001: The Space Odyssey* (film).

Lemonick, M. D. & Dorfman, A. (1999) *Up from the Apes*. Time magazine, 23.8.1999.

Lombardo, T. (2006) *The Evolution of Future Consciousness*. AuthorHouse, Bloomington.

Loye, D. (1983) *The Sphinx and the Rainbow. Brain, Mind and Future Vision*. Bantam Books, New York.

Malaska, P. (1965) *Aikasarjoihin perustuva tutkimus sähköenergian kulutuksen rakenteista Suomessa vuosina 1945-1963*. [A time-series based study of the structure of electrical energy consumption in Finland 1945–1963.] Suomen teknillinen korkeakoulu, Helsinki.

Malaska, P. (1997) *Global Conversations – What You And I Can Do for Future Generations*. Futura 16/1997, 62–64.

Malaska, P. & Holstius, K. (2009) *Advanced Strategic Thinking. Visionary Management for Leaders*. Lap Lambert, Saarbrücken. Turun kauppakorkeakoulun sarja A-8:2004.

Malaska, P. & Masini, E. B. (eds.) (2009) *Philosophical Essays of Knowledge of the Future*. Futura 1/2009.

Masini, E. B. (2009) *Luis De Molina as a Precursor of the Basis Philosophical and*

Ethical Thinking in Futures Studies. *Futura* 1/2009, 6–14.

Masini, E. B. (1993) *Why Futures Studies?* Grey Seal, London.

Millennium Project (2016) [www.stateofthefuture.org](http://www.stateofthefuture.org), accessed 28.1.2017.

Millennium Project (2010) *Futures Research Methodology, Version 3.0.*

Molina, L. de (1589) *Concordia*. <http://www.nd.edu/~afreddos>, accessed 5.4.2012.

Opetushallitus (2012) Ensti, Opetushallitus – Ennakoinnin sähköinen tietopalvelu ENSTI. [National Board of Education: electronic foresight information service.] [www.oph.fi/info/ensti](http://www.oph.fi/info/ensti), accessed 5.4.2012.

Parkin, R. L. (1997) *Future Schlock*. *New York Times*, 30.12.1997.

Pelttari, M. (2010) Martin Heidegger: Tekniikka ja käänne. *Niin&Näin* -lehden julkaisusarja. [Martin Heidegger: Technology and transition.] <http://netn.fi/kirjat/martin-heidegger-tekniikka-ja-kaanne>, accessed 5.4.2012.

Rescher, N. (1998) *Predicting the future: An introduction to the theory of forecasting*. State University of New York, Albany.

Wells, H. G. (1902) *Anticipations of Reaction of Mechanical and Scientific Progress upon Human Life and Thought*. Chapman & Hall, London.

Wright, G. H. von (2009) *Determinism and the Knowledge of the Future*. *Futura* 1/2009, 15–27.

## **Chapter 4. Repairing humankind's relationship with nature**

Aamulehti (date unknown) Pentti Malaska ennustaa Wärtsilälle seuraajia – Kasinotalous tuo yllätyksiä. [Pentti Malaska expects to see followers to Wärtsilä – the casino economy brings surprises.]

Elonkehä (9/2003) Velanmaksu luonnolle. [Paying our debt back to nature.]

Etelä-Saimaa 6.2.1990 Luonnonmukainen teknologia – vastaus ihmisen ja luonnon ristiriitaan? [Natural technology – the answer to the human-nature conflict?]

Helsingin Sanomat 9.2.1975 Rooman klubi ei julista tuomiopäivää. [Club of Rome does not declare judgement day.]

Helsinki-info 5.12.1999 Tulevaisuus – ihmistarhassa? [The future – in a human zoo?]

Ilta-Sanomat 11.3.1995 Professori Pentti Malaska haluaisi toimintaa, mutta ”rahaa ei ole”. [Professor Pentti Malaska would want action, but ‘there is no money’.]

Kanava (7/1995) Tulevaisuuden vedenjakajalla. [On the watershed to the future.]

Keskisuomalainen (1993) Professori Pentti Malaska: Suomen lama ei ole pelkkä suhdannejuttu. [Professor Pentti Malaska: Finnish recession not just a cyclical downturn.]

Kotiliesi 7.9.1990 Tavallisen ihmisen ei tarvitse pelätä lamaa. [No need for ordinary people to fear the recession.]

Lehti tuntematon (1992) Teknosysteemi syö vaihtoehtonsa. [Technosystem consumes its alternatives.]

Luonnonsuojelija (2/2003) Laina luonnolta. [On loan from nature.]

Malaska, P. (2011) Joku innovatiivisempi suunta on jäänyt huomiotta. [A more innovative direction has been ignored.] In: Grönroos, R. (toim.) Uuskasvua ymmärtämässä – kutsu kestävään tuottavuuteen, 186–196. [Understanding neogrowth – an invitation to sustainable productivity.] TeliaSonera Finland Oyj, Helsinki.

Malaska, P. (2009) Taloustiede ja talouskriisit – kommentteja keskusteluun. Kommenttipuheenvuoro Luonnon filosofisen seuran seminaarissa. [Economics and economic crises – comments on the debate. Comment at Finnish Society for Natural Philosophy seminar.] Helsinki, 17.2.2009.

Malaska, P. (2001) Ihmisen ja luonnon harmoninen vuorovaikutus. [Harmonious human-nature interaction.] In: Heinonen, J. (toim.) Luovaan tasapainoon, 38–50. [Towards creative balance.] Ekosäätiö, Pieksämäki.

Malaska, P. (1988) Onko ihmisen ja luonnon ristiriidalle ratkaisua? [Does there exist a solution to the human–nature conflict?] Futura 2/1988.

Savon Sanomat 9.6.1990 Poliitikot määräävät vain vauhdin – Teknokraatit suunnittelevat yhteiskuntaa mieleisekseen. [Politicians only determine the rate of advance – technocrats are shaping society as they please.]

Suomen luonto (2/1991) Luonnonlait tekniikkaa palvelemaan. [Natural laws in the service of technology.]

Teollisuus (5/1979) Luonnolla on takaisiniskumekanismeja – Kasvun ajatus on arvioitava uudelleen. [Nature has kickback mechanisms – The idea of growth must be reassessed.]



Tiede 2000 (7/1990) Luonnosta mallia tekniikkaan. [Nature provides model for technology.]

Turun Sanomat 24.7.1995 Eettiset valinnat kehityksen pohjaksi. [Grounding development in ethical choices.]

Savon Sanomat 2.2.1975 Oikeita kysymyksiä, mutta ei maailmanloppua. [The right questions, but not the end of the world.]

## **Chapter 5. Putting the common development of humankind first**

Helsingin Sanomat 16.12.2002 Energiateknologiat kehittyvät. [Energy technologies moving forward.]

Helsingin Sanomat 7.2.1997 Palvelusta uusi talouden perusta. [Services provide new foundation for economy.]

Hengellinen kuukausilehti (11/1988) Eettisissä arvoissa ja uudessa tiedossa on ihmiskunnan toivo. [Hope of humankind lies in ethical values and new knowledge.]

Ilta-Sanomat 11.3.1995 Professori Pentti Malaska haluaisi toimintaa, mutta ”rahaa ei ole” [Professor Pentti Malaska would want action, but ’there is no money’.]

Keskisuomalainen 23.1.1994 Suomalaisuuden harharetket. [Odysseys of Finnish identity.]

Keskisuomalainen 6.8.1989 Kuka kantaa vastuun energiapolitiikasta? [Who’s responsible for energy policy?]

King, A. & Schneider, B. (1991) Ihmiskunnan vallankumous – Rooman klubin työvaliokunnan raportti. [The First Global Revolution? A Report by the Council of the Club of Rome.] WSOY, Juva.

Lemma, A. & Malaska, P. (1989) Africa Beyond Famine – A Report to the Club of Rome. Tycooly Publishing, London.

Luonnonsuojelija (5/2005) Räjähävän tietämättömyyden kynnyksellä. [On the verge of explosive ignorance.]

Malaska, P. (2011) Joku innovatiivisempia suunta on jäänyt huomiotta. [A more innovative direction has been ignored.] In: Grönroos, R. (ed.) Uuskasvua ymmärtämässä – kutsu kestävään tuottavuuteen, 186-196. [Understanding neo-growth – an invitation to sustainable productivity.] TeliaSonera Finland Oyj, Helsinki.

Malaska, P. (2002) Eettiset valinnat vai evoluutio. [Ethical choices or evolution.] Lecture Studia Generalia Oecouniversitatis, 28.11.2012, Mikkeli.

Malaska, P. (1976) New International Order. Liiketaloudellinen aikakauskirja (erityisnumero), 3/1976, Helsinki.

Malaska, P. – Kantola, I. & Kasanen, P. (1989) Arvot ja ristiriidat energiakeskustelussa. [Values and conflicts in the energy debate.] In: Malaska, P. – Kantola, I. & Kasanen, P. (eds.) Riittääkö energia – riittääkö järki? [Do we have enough energy – do we have enough sense?] 14–26. Oy Gaudeamus Ab, Helsinki.

Malaska, P. & Kasanen, P. (1987) Ydinvoima – Kohtalon kysymys? [Nuclear energy – a question of fate?] Sarja B:63. Kauppa- ja teollisuusministeriö.

Mistä vaaleissa vaietaan – Kokonaiskuva kotiplaneetasta kateissa? -seminaari [What's hushed up in the elections – where's the bigger picture of our home planet? Seminar 5.4.2011.

Sosiaalivakuutus (4/1987) AIDS on päätöksenteon kannalta erikoinen ongelma. [AIDS a special problem for decision-making.]

Suomenmaa 10.5.2006 Kallis virheinvestointi. [An expensive misinvestment.]

Suomen Sosiaalidemokraatti 6.7.1984 Rooman klubi tulee Helsinkiin – Luonto ei kestä kertakäyttöä. [Club of Rome coming to Helsinki – Nature can't cope with throwaway culture.]

Tammenlastuja (1/2009) Pentti Malaska – Ennalta näkijä, edellä kulkija. [Pentti Malaska – A visionary and forerunner.]

Talouselämä (31/2004) Rooman klubi ei iloitse. [Club of Rome not celebrating.]

Talouselämä (25/1993) Markkinatalous vai kapitalismi? [Market economy or capitalism?]

Turun Sanomat 26.9.1994 Markkinatalous ei ole kapitalismia. [Market economy is not capitalism.]

Turun Sanomat 3.5.1992 Väkiluku kaksinkertaistuu alle ihmisiässä. [Population to double in less than a human lifetime.]

Turun Sanomat 13.1.1989 Afrikan tyrmättävä talouden kasvun utopia. [Africa must reject utopia of economic growth.]

Turun Sanomat 10.10.1987 Ihmissuhteet ja luovuus kunniaan. [Celebrating human relations and creativity.]

Turun ylioppilaslehti 15.12.1989a Miltä Afrikka näyttää? [What does Africa look like?]

Turun ylioppilaslehti 17.11.1989b Riittääkö energia – riittääkö järki? [Do we have enough energy – do we have enough sense?]

## **Chapter 6. Human potential as driver of humankind's development**

Anjalankosken Sanomat 7.8.2003 Murroskauden ihminen – eksyksissä uuden edessä. [Humans of a transitional age – lost in the face of what's new.]

Apu 17.1.1992 Rooman klubin suomalaisjäsen Pentti Malaska: Vaadimme val-lankumousta. [Pentti Malaska, Finnish Club of Rome member: we're calling for a revolution.]

Elonkehä (5/2004) Pentti Malaska kysyy poistaako tekniikka etiikan? [Pentti Malaska: does technology render ethics unnecessary?]

Helsingin Sanomat 25.1.1995 Kilpailukyky – ratkaisu vai ongelma? [Competitiveness – a solution or the problem?]

Hengellinen kuukausilehti (11/1988) Eettisissä arvoissa ja uudessa tiedossa on ihmiskunnan toivo. [Hope of humankind lies in ethical values and new knowledge.]

Keskisuomalainen 23.1.1994 Suomalaisuuden harharetket. [Odysseys of Finnish identity.]

Kotiliesi 7.9.1990 Tavallisen ihmisen ei tarvitse pelätä lamaa. [No need for ordinary people to fear the recession.]

Länsi-Savo 13.12.1987 Vuonna 2057 suomalaisten hyvinvoinnin takaa vuorovai-kutusyhteiskunta. [In 2057, society of intangible needs will guarantee the well-being of Finnish people.]

Malaska, P. (2005) Globalisaation etiikka: johdetaanko meitä edestäpäin vaiko takaa tökkimällä. [The ethics of globalization: are we being led from the front or prodded from behind?] Talk at MindTrek seminar, 7.11.2005, Tampere.

Malaska, P. (1999) A Conceptual Framework for the Autopoietic Transformation of Societies. FUTU-publication 5/99. Futures Research Centre. Turku School of Economics and Business Administration. Turku.

Malaska, P. (1996) Luentoaineistoa. [Lecture materials.]

Malaska, P. (1993) Uusia näkökulmia ympäristöongelmiin ja tekniikan kehittämiseen. [New perspective on environmental problems and the development of technology.] Draft. Turun kaupakorkeakoulu, Turku.

Malaska, P. & Mannermaa, M. (1992) Yhteiskunnan laajavaikutteinen murros siirtäessä teollisuusyhteiskunnasta palveluyhteiskuntaan. [Sweeping changes in the transition from industrial to service society.] Maailahallitus – Sata vuotta, 18–30.

Pellervo (2/1984) Mihin tästä yhteiskunta? [Where next, society?]

Pellervo (3/1983) Vielä on syytä elää. [There's still reason to live.]

Savon Sanomat 28.8.1988 Upoammeko upeasti kuin Titanic vai etsimmekö vaihtoehtoja? [Will we sink grandly like the Titanic or search for alternatives?]

Sosiaalivakuutus (1/1984) Arvoista, työstä ja toimeentulosta tulevaisuudessa. [On values, work and income in the future.]

Suomen kiinteistölehti (3/2000) Kansalaisliikkeet vastapainoksi – Businessvaltio jyrää. [Business state goes from strength to strength – Civic movements to provide counterbalance.]

Suomen kuvalehti 3.9.1999 (article title unknown).

Suomen kuvalehti (48/1982) Rooman klubi uskoo kehittyvän tiedonvälityksen tuovan uutta toivoa ihmiskunnalle. [Club of Rome believes advances in data communications will bring new hope to humankind.]

Suomen Sosiaalidemokraatti 6.7.1984 Rooman klubi tulee Helsinkiin – Luonto ei kestä kertakäyttöä. [Club of Rome coming to Helsinki – Nature can't cope with throwaway culture.]

Tietouutiset (4/1987) Pentti Malaskan ajatuksissa ja visioissa ei jälkeäkään fraaseista. [No trace of clichés in Pentti's Malaska's thoughts and visions.]

Tietoyhteiskuntafoorum (2/1997) Hypersykli verkostoissa työkaluksi hyvään elämään. [Network hypercycle provides tool for the good life.]

Turun Sanomat 8.9.1996 Henri Bromsin ja Pentti Malaskan materialismin kritiikki. [Henri Broms and Pentti Malaska critique materialism.]

Turun Sanomat 10.10.1987 Ihmissuhteet ja luovuus kunniaan. [Celebrating human relations and creativity.]

Turun Sanomat 28.8.1983 Tavaroiden sijasta tulemme kuluttamaan ihmissuhteita. [Instead of goods, we will consume human relations.]

## **Chapter 7. Planetary modelling and energy research**

Planetary consciousness and planetary statistics

Malaska, P. (2011) Planetaarinen tilastotoimi. [Planetary statistics.] Futura 1/2011.

Malaska, P. (2010) Planetaarinen tilastotoimi. [Planetary statistics.] Suomen tilastoseuran vuosikirja 2010. Helsinki.

Malaska, P. (1994) Progress, nature and technology in late modern transition. Futures, Vol. 26 (5), 529–541.

Tammenlastuja (1/2009) Pentti Malaska – Ennalta näkijä, edellä kulkija. [Pentti Malaska – A visionary and forerunner.]

### ***Exergy and ASA analysis***

Kaivo-oja, J. – Luukkanen J. & Malaska, P. (2001) Advanced Sustainability Analysis. In: Tolba, M. K. (ed.) Our Fragile World. Challenges and Opportunities for Sustainable Development. Encyclopedia of Life Support Systems and Sustainable Development. Vol 2. EOLSS Publishers Co. Ltd, Oxford.

Kaivo-oja, J. – Luukkanen, J. § Malaska, P. (2001) Sustainability Evaluation Frameworks and Alternative Analytical Scenarios of National Economies. Population and Environment. A Journal of Interdisciplinary Studies, Vol. 23 (2), 193–215.

Malaska, P. – Luukkanen, J. – Grönfors, K. & Kantola, I. (1989) Suomen energiakäytön eksergiataseet. [Exergy balance sheets for Finnish energy consumption.] Esitutkimusraportti N:o 120/881/88. Kauppa- ja teollisuusministeriö.

### ***Energy tax comparisons and practices of energy and environmental policy***

Luukkanen, J. & Vehmas, J. (1997) Diskursiivinen taistelu Suomen energiaverotuksesta. [A battle of discourses on Finnish energy taxation.] Kosmopolis, Vol. 27 (4), 25–49.

Malaska, P. – Luukkanen, J. – Vehmas, J. & Kaivo-oja, J. (1996) Ympäristöperusteinen energiaverotus. Pohjoismaisia vertailuja ja suomalaisen keskustelun arviointia. [Environmentally based energy taxation. Nordic comparisons and a review of the Finnish debate.] Ympäristöministeriö, Suomen ympäristö, 39. Helsinki.

Malaska, P. – Luukkanen, J. – Vehmas, J. & Kaivo-oja, J. (1996) Energiaverotus

tuksen yhdenmukaistaminen valtioneuvoston periaatepäätöksen pohjalta: Upward- vai downward-harmonisointi pohjoismaisten vertailulaskelmien pohjalta. [Harmonization of energy taxation based on Government resolution: Upward or downward harmonization on the basis of Nordic comparisons.] *Kansantaloudellinen aikakauskirja* 92 (3), 260–279.

Vehmas, J. (2002) Rahat Ruotsiin ja päästöt Tanskaan. Suomen ympäristöperusteisen energiaverotuksen rekonstituutio 1993-96. [Funds to Sweden, emissions to Denmark. Reconstitution of Finnish environmentally-based energy taxation 1993–96.] *Acta Universitatis Tamperensis* 861. Tampere University Press, Tampere.

Vehmas, J. – Kaivo-oja, J. – Luukkanen, J. & Malaska, P. (1999) Environmental Taxes on Fuels and Electricity – Some Experiences from the Nordic Countries. *Energy Policy*, Vol. 27 (6), 343–355.

## **Chapter 8. Visionary management**

### ***Pentti Malaska's contributions to developing systems thinking and strategic thinking***

Godet, M. (2000) How to Be Rigorous with Scenario Planning. *Foresight*, Vol. 2 (1), 5–9.

Godet, M. (1993) From Anticipation to Action. A Handbook of Strategic Prospective. Future-Oriented Studies. UNESCO. Paris.

Holstius, K. & Malaska, P. (2004) Advanced Strategic Thinking – Visionary Management. Turun kauppakorkeakoulun julkaisu, Sarja A-8:2004. Turku.

Kahn, H. & Wiener, A. J. (1996) The Next Thirty-Three Years: A Framework for Speculation. *Daedalus*, Vol. 96 (3), 705–732. The MIT Press on Behalf of American Academy of Arts & Sciences.

Kaivo-oja, J. (2002) Tulevaisuuden tekeminen strategisen ajattelun valossa. [Making the future in the light of strategic thinking.] In: Kamppinen, M. – Kuusi, O. & Söderlund, S. (eds.) *Tulevaisuudentutkimus – Perusteet ja sovellutukset*. [Futures research – Foundations and applications.] *Suomalaisen Kirjallisuuden Seuran toimituksia* 896, 224–248. Helsinki.

Kaivo-oja, J. – Luukkanen, J. & Malaska, P. (2001) Sustainability Evaluation Frameworks and Alternative Analytical Scenarios of National Economies. Popula-

tion and Environment, Vol. 23 (2), 193–215.

Lehto, S. T. (1996) Muistikuvia ja merkintöjä. Teollisuuden piirissä koettua. [Recollections and experiences from the realm of industry.] WSOY, Helsinki.

Malaska, P. (2003) Synchronic – Diachronic System Analysis. In: Höglund, R. – Jäntti, M. & Rosenqvist, G. (eds.) *Statistics, Econometrics and Society: Essays in Honour of Leif Nordberg*. Statistics Finland Research Report 238, 155–164.

Malaska, P. (1985) Multiple Scenario Approach and Strategic Behavior in European Companies. *International Strategic Management Journal*, Vol. 6 (4), 339–355.

Malaska, P. & Holstius, K. (2011) *Advanced Strategic Thinking: Visionary Management for Leaders*. Lambert Academic Publishing, Saarbruecken.

Malaska, P. & Holstius, K. (1999) Visionary Management. *Foresight*, Vol. 1 (4), 353–361.

Malaska, P. – Kaivo-oja, J. & Luukkanen, J. (1999) Sustainability and Economic Growth: A Theoretical Framework and Empirical Demonstrations. FUTU-publication 4/99. Futures Research Centre. Turku School of Economics and Business Administration. Turku.

Malaska, P. & Kasanen, E. (2004) Strategic Vision: A Third Level of Management. In: Laaksonen, M. & Pynnönen, S. (eds.) *Contributions to Management Science, Mathematics and Modelling. Essays in Honour of Professor Ilkka Virtanen*. Acta Wasaensia No. 122, 107–124.

Malaska, P. & Kinnunen, T. (1986) A Model of Management Goal Setting and its Dissipative Structure. *European Journal of Operational Research*, Vol. 25, 75–84.

Malaska, P. – Malmivirta, M. – Meristö, T. & Hansen, S-O. (1984) Scenarios in Europe – Who Uses Them and Why? *Long Range Planning*, Vol.17 (5), 45–49.

Malaska, P. & Mannermaa, M. (1985) Tulevaisuudentutkimus Suomessa. [Futures research in Finland.] Gaudeamus, Juva.

Malaska, P. & Virtanen, I. (2005) Orienteering in the Futures Universe: A Map-Analogy-Based Set-Theoretic Approach to the Theory of Futuribles. In: Laitinen, E. K. & Laitinen, T. (eds.) *Contributions to Accounting, Finance and Management Science. Essays in Honour of Professor Timo Salmi*. Acta Wasaensia No. 143, 261-284.

Malaska, P. & Virtanen, I. (2002) Tulevaisuuksienkaikkeus. [The futures universe.] In: Malaska, P. (ed.) *Eero Kasanen 50 vuotta*. Opinnäytekerhon onnittelut.

[Eero Kasanen 50 years: congratulations from the thesis circle.] Turun kauppakorkeakoulun julkaisuja, Sarja C-1:2002, 71–88. Turku.

Mannermaa, M. (1999) Tulevaisuuden hallinta. Skenaariot strategiatyöskentelyssä. [Managing the future. Scenarios in strategy work.] *Ekonomia-sarja*. WSOY, Porvoo.

Mannermaa, M. (1991) Evolutionaarinen tulevaisuudentutkimus. [Evolutionary futures research.] *Acta Futura Fennica* No. 2. VAPK, Helsinki.

Mannermaa, M. & Malaska, P. (1992) Innovatiivinen yhteiskuntakehitys ja teknologia. Tulevaisuudentutkimuskeskuksen tutkimusohjelman suunnitelma. [Innovative social development and technology. Research plan for Finland Futures Research Centre.] Turun kauppakorkeakoulun julkaisuja, Keskustelua ja raportteja 3:1992. Turku.

Masini, B. E. (1993) *Why Futures Studies?* Grey Seal, London.

Meristö, T. (1991) Skenaariotyöskentely yrityksen johtamisessa. [Scenario planning in business management.] *Acta Futura Fennica* No. 3. VAPK, Helsinki.

Vehmas, J. – Petäjä, J. – Kaivo-oja, J. & Malaska, P. (1998) Ilmastopolitiikka ja Suomi - kansainvälisiä näkökohtia sekä kansallisia sähköntuotannon ja -kulutuksen skenaarioita. [Climate policy and Finland – international perspectives and national scenarios for electricity production and consumption.] *Suomen ympäristö 223*. Ympäristöministeriö. Oy Edita Ab, Helsinki.

Wilenius, M. (2014) *Society, Consciousness and Change – An Inquiry into Pentti Malaska's Futures Thinking*. *Futures*, Vol. 61, 58–67.

Wilson, I. & Ralston, B. K. (2006) *Scenario Planning Handbook: Developing Strategies in Uncertain Times*, 1st Edition. Thomson South-Western, Mason.

### ***Futures thinking and visionary management***

Aamulehti 19.5.1995. Vähemmästä saadaan irti yhtä enemmän. [More is being produced from less.]

Holstius, K. & Malaska, P. (2004) *Advanced Strategic Thinking – Visionary Management*. Turun kauppakorkeakoulun julkaisuja, Sarja A-8:2004. Turku.

Holstius, K. & Malaska, P. (1999) *Visionary Management*. *Foresight*, Vol. 1 (4), 353–361.

Kauppalehti 7.7.1983. Muuttunut yritys ympäristö muuttaa päätöksenteon.



[Changed business environment is changing decision-making.]

Kauppalehti 2.12.1982. Pelastus korvien välissä. [Salvation between the ears.]

Kauppalehti 16.3.1984. Ruotii uhat ja mahdollisuudet: Malaskan skenaariot. [Threats and opportunities analysed in Malaska's scenarios.]

Malaska, P. – Kantola, I. & Kasanen, P. (1989) Riittääkö energia – riittääkö järki? [Do we have enough energy – do we have enough sense?] Oy Gaudeamus Ab, Helsinki.

Talouselämä (9/1984) Skenaario on työkalu tulevaisuuteen. [Scenario – a tool for exploring the future.]

Tehokas yritys (1/1975) Laadullisen kasvun tajuaminen tärkeää yritysjohdolle. [Understanding qualitative growth crucial for business management.]

## **Chapter 9. Other areas of interest for Pentti Malaska**

### ***Futures research, operations research, statistics and mathematical modelling***

Kaivo-oja, J. – Ahokas, I. – Malaska, P. & Luukkanen, J. (2002) The Information Society and Changes in the Labour Market: A Comparison of Work Profile Changes in the EU, the USA and Japan. In: Stanford-Smith, B. – Chiozza, E. & Edin, M. (eds.) Challenges and Achievements in E-business and E-Work, 504–511. IOS Press, Amsterdam.

Lehto, S. T. (1996) Muistikuvia ja merkintöjä. Teollisuuden piirissä koettua. [Recollections and experiences from the realm of industry.] WSOY, Helsinki.

Malaska, P. (2003) Synchronic–diachronic system analysis. In: Höglund, R. – Jännti, M. & Rosenqvist, G. (eds.) Statistics, Econometrics and Society: Essays in honour of Leif Nordberg. Statistics Finland Research Report 238, 155–164.

Malaska, P. (2002) Kauppateollisen osaamisen kasvava merkitys muuttuvassa yliopistomaailmassa. [Growing significance of economics know-how in the changing academic world.] In: Malaska, P. (ed.) Eero Kasanen 50 vuotta. Opin- näytekерhon onnittelut. [Eero Kasanen 50 years: congratulations from the thesis circle.] Turun kauppakorkeakoulun julkaisuja, sarja C-1:2002, 17–36. Turku.

Malaska, P. (2000) Knowledge and Information in Futurology. Foresight, Vol. 2 (2), 237–244.

Malaska, P. (1999) Sociocybernetic Transients of Work in the Late-Industrial Period. In: Millennium III, 121–134. Bucharest, Romania.

Malaska, P. (1996) The Productivity Dilemma. A Model Approach. In: Carlsson, C. (ed.) The Art and Science of Decision Making. Åbo Akademi University Press, Turku.

Malaska, P. (1976) Non-Waste Technology and Production. Proceedings of an International Seminar Organized by the Senior Advisers to ECE Governments on Environmental Problems on the Principles and Creation of Non-Waste Technology and Production, Paris, 29 November–4 December 1976, 33–38.

Malaska, P. (1970) Operaatiotutkimus. [Operations research.] Kansantaloudellinen aikakauskirja, LXVI, Nide 1, 31–37.

Malaska, P. (1968) Onko maamme lämmitysöljyn tuontikapasiteetti oikein mitoitettu? [Are we importing the right amount of heating oil into Finland?] Kansantaloudellinen aikakauskirja, LXIII, Nide 1, 130–139.

Malaska, P. (1967) Yksityisen sektorin ja julkisen sektorin yhteistoiminnan edellytyksistä määrätyllä toimialalla. [On the preconditions for private-public collaboration in a specific industry branch.] Kansantaloudellinen aikakauskirja. LXIII, Nide 1, 35–40.

Malaska, P. (1965) Sähköenergian tuotannon kokonaistaloudellisesta optimoinnista. [On the economic optimization of electrical energy production.] Kansantaloudellinen aikakauskirja, LXI, Nide 2, 137–154.

Malaska, P. (1963) Aikasarjoihin perustuva tutkimus sähköenergian kulutuksen rakenteesta Suomessa vuosina 1945-1963. [A time-series based study of the structure of electrical energy consumption in Finland 1945–1963.] Nide 18. Suomen teknillinen korkeakoulu, Helsinki.

Malaska, P. – Luukkanen, J. & Kaivo-oja, J. (1999) Decomposition Method in Sustainability Analysis. FUTU-publication 3/99. Finland Futures Research Centre. Turku School of Economics and Business Administration. Turku.

Malaska, P. & Reponen, T. (1979) Yrityksen johtamisen ongelma-alueita 1980-luvulla. [Problem areas for business management in the 1980s.] Turun kauppa-  
korkeakoulun julkaisuja, Sarja A-7:1979. Turku.

Malaska, P. & Virtanen, I. (2007) Uskottavaan päättelyyn perustuvasta todennäköisyysteoriasta. [Probability theory based on credible deduction.] Turun kauppa-  
korkeakoulun julkaisuja, Sarja C. Turku.

Malaska, P. & Virtanen, I. (2005) Matemaattinen mallinnus tulevaisuuden tutkimuksessa. [Mathematical modelling in futures studies.] *Futura* 2–3/2005, 6–8.

Mannermaa, M. & Malaska, P. (1992) Innovatiivinen yhteiskuntakehitys ja teknologia. Tulevaisuudentutkimuskeskuksen tutkimusohjelman suunnitelma. [Innovative social development and technology. Research plan for Finland Futures Research Centre.] Turun kauppakorkeakoulujen julkaisuja. Keskustelua ja raportteja 3:1992. Turku.

Miettinen, E. & Malaska, P. (1980) Yrittäjän näkökulmasta. [The entrepreneur's perspective.] Koneen Systemiryhmä A-8. Helsinki.

Operaatiotutkimusseura (2003) Muistelmia operaatiotutkimuksen historiasta. [Historical recollections of operations research.] [www.operaatiotutkimus.fi/seminaarit/203/materiaali/juhlajulkaisu1.pdf](http://www.operaatiotutkimus.fi/seminaarit/203/materiaali/juhlajulkaisu1.pdf).

Rivett, P. & Ackoff, R. L. (1963) *A Manager's Guide to Operational Research*. New York.

Santa Fe Institute (2016) <http://www.santafe.edu>, accessed 18.1.2016.

### ***Pentti Malaska's Chinese connections***

Matching Futures, Proceedings of the Sino-Finnish Seminar on Futures Studies in Beijing (1993) *Futura* 1/1993, 117–129.

Workshop of Futures Studies in Beijing 4–5 September 1985 (1985), Publication of the Finnish Society for Futures Studies, Series A8.

## **Chapter 11. Futures research as creator of meanings**

Botkin, J. W. – Elmandjra, M. & Malitza M. (1981) *No Limits To Learning – Bridging The Human Gap – A Report To The Club Of Rome*.

Heinonen, S. (2000) *Prometheus Revisited – Human Interaction with Nature through Technology in Seneca*. *Commentationes Humanarum Litterarum* 115. *Societas Scientiarum Fennica*. Helsinki.

Itä-Savo 20.7.1994 *Olemme vaihtaneet harhoja*. [We have changed our illusions.]

Kaivo-oja, J. (2004) *Analyses of Historical and Future Problems of Sustainable Development: Research Articles in Spatial Sustainability Analysis, Planning and Evaluation*. *Acta Universitatis Tamperensis* 1038, University of Tampere. Tampere.

een yliopistopaino Oy Juvenes Print, Tampere.

Keskinen, A. (1999) Towards User Empowerment. On Development of Utilization of Information and Communications Technology in Decision Making of Administrations. *Studia Politica Tamperensis* No.6. University of Tampere, Tampere.

Malaska, P. (2010) Uuskasvusta. [Neo-growth.] TeliaSonera. Helsinki.

Malaska, P. (1985) Väyliä tulevaisuuteen. [Avenues to the future.] *Tulevaisuuden tutkimuksen seuran jäsenlehti* 3/1985, 14.

Malaska, P. & Masini, E. (2009) Philosophical Essays of Knowledge of the Future. *Futura* 28/2009.

Rubin, A. (2000) Growing Up in Social Transition: In Search of a Late Modern Identity. *Annales Universitatis Turkuensis. Ser. B. Tom. 234. Humaniora.* University of Turku, Turku.

Viherä, M-L. (1999) Ihminen tietoyhteiskunnassa. Kansalaisten viestintävalmiudet kansalaisyhteiskunnan mahdollistajana. [Humans in information society. Citizens' communications skills as facilitators of civic society.] Turun kauppakorkeakoulun julkaisuja, Sarja A-1: 1999. Turku.

Wilenius, M. (1997) Faust on Wheels. Conceptualizing Modernization and Global Climate Change. The Finnish Society of Sciences and Letters and The Finnish Academy of Science and Letters. Helsinki.



# CONTRIBUTORS TO THIS VOLUME

## **Eleonora Barbieri Masini**

Eleonora Barbieri Masini has served as Professor of Futures Studies and Human Ecology at the Gregorian University in Rome and the University of Trieste, Italy. She has also served as President of the WFSF and is an honorary member of the Club of Rome. She came to know Pentti through the Club of Rome



## **Olavi Borg**

Olavi Borg served as Professor of Political Science at the University of Tampere in 1973–1998 and as Professor of Social Science Methodology in 1966–1972. He came to know Pentti first and foremost through the joint development projects of the Finnish Society for Futures Studies and other organizations and institutions in the futures research field.



## **Jim Dator**

Professor Jim Dator has served as Director of the Hawaii Research Centre for Futures Studies. He came to know Pentti in 1983 and they worked very closely in 1988–1993 when Jim was President of the WFSF and Pentti Secretary-General. Jim is also managing editor of the *World Future Review*.



## **Ted Fuller**

Ted Fuller is Professor of Entrepreneurship and Strategic Foresight at the University of Lincoln, UK. He is also Editor-in-Chief of the *Futures* journal. Ted came to know Pentti in 1997 through the WFSF and he visited Pentti at the University of Turku on several occasions.



## **Sirkka Heinonen**

Sirkka Heinonen is Professor of Futures Studies, Director of the Finland Futures Research Centre's Helsinki Office and member of the Club of Rome. She completed her PhD in Pentti Malaska's research project on 'Citizenship and Ecomodernisation in the Information Society (FUTU)'. For Sirkka, Pentti was a teacher, colleague and friend – and above all a role model.



### **Karin Holstius**

Pentti's wife Karin Holstius has served as Professor of International Business at the Turku School of Economics and at Lappeenranta University of Technology. She has co-authored a dozen or so articles with Pentti.



### **Jari Kaivo-oja**

Adjunct Professor Jari Kaivo-oja, Doctor of Administrative Sciences, worked closely with Pentti at the Finland Futures Research Centre from 1995 onwards in a number of national and international projects concerned with energy economy, sustainable development and foresight research on information society development.



### **Jyrki Luukkanen**

Adjunct Professor Jyrki Luukkainen, Doctor of Science in Technology, began his collaboration with Pentti in 1987 in a project designed to produce a national exergy balance for Finland. They went on to collaborate in a number of projects dealing with energy, environment and information society themes, and worked extensively to develop ASA methods and decomposition analysis.



### **Ilkka Niiniluoto**

Academician of Science, Professor of Theoretical Philosophy at the University of Helsinki, Ilkka Niiniluoto came to know Pentti in the 1980s. Their collaboration centred around the Finnish Society for Futures Studies and the Finland Futures Academy.



### **Laura Pouru**

Laura Pouru (M.Soc.Sc.), currently working as Project Manager at Finland Futures Research Centre, has personally never met Pentti, but she gained a deep understanding of Pentti's theories and ideas while preparing this volume and reviewing interviews, articles and studies published during his career.



### **Jarmo Vehmas**

Adjunct Professor Jarmo Vehmas, Doctor of Administrative Sciences, Head of the Tampere Office of the University of Turku Finland Futures Research Centre, worked closely with Pentti on several energy and climate policy research projects from the 1990s onwards.



### **Marja-Liisa Viherä**

Marja-Liisa Viherä (PhD) came to know Pentti via the Finnish Society for Futures Studies in the 1980s. She did her doctoral dissertation under Pentti's supervision at the Turku School of Economics in 1999 and is currently honorary member of the Finnish Society for Futures Studies.



### **Ilkka Virtanen**

University of Vaasa Professor Emeritus of Business Mathematics Ilkka Virtanen first met Pentti in 1968. Ilkka took his postgraduate studies under Pentti's supervision. They continued to work very closely until the very end, for instance in connection with postgraduate tutoring, various expert assignments and research projects around basic methodological issues associated with futures research.



### **Markku Wilenius**

Markku Wilenius is Professor of Futures Studies at University of Turku, UNESCO Chair in Learning Society and Futures of Education and member of the Club of Rome. He first began working with Pentti at the Finland Futures Research Centre in 1996, and in 1999 he became the Centre's third director after Pentti and Tarja Meristö. He continued to remain in contact with Pentti until the very end, exchanging views on current world issues.



### **Reijo Wilenius**

University of Jyväskylä Professor Emeritus of Philosophy Reijo Wilenius was a close friend of Pentti's. They came to know each other in 1970 and worked closely among other things in connection with the Critical Academy and around Rudolf Steiner's social thinking.







# PENTTI MALASKA'S CV

Professor, Doctor of Science (Technology)

Born 11 April 1934, Käkisalmi, Finland

Deceased 15 March 2012, Helsinki, Finland

## **Education:**

- Matriculation examination, Lappeenranta lyceum, 1953
- Master of Science (Technology), Helsinki University of Technology, 1958
- Doctor of Science (Technology), Helsinki University of Technology, electrical engineering, 1965

**Spouse:** Karin Holstius, professor, 1987–

**Children:** Heikki, b. 1955 & Tiina, b. 1958

**Parents:** Ensio Malaska, b. 1908, self-employed & Kerttu Malaska née Lastikka, b. 1908, midwife

**Military rank:** lieutenant

**Leisure interests:** reading, research, online discussions

## **Decorations, honorary degrees and awards:**

- Knight, First Class, of the Order of the White Rose of Finland
- Commander, First Class, of the Order of the Lion of Finland
- Finnish Society for Futures Studies Futures Awards, 1990, 1998
- Engineering Society in Finland medal and plaque, 1975, 1978
- Aurelio Peccei Medal, Associazione culturale L'ETA' VERDE, 1989
- Russian Academy of Sciences Kondratiev Medal, 1998
- Finnish Association for Nature Conservation Environment Award, 2002
- Oracle of Delphi statue, Culture Forum Academy of Ilpo's Award, 2003
- Doctor of Science (Economics and Business Administration), honoris causa, University of Vaasa, 2006
- Finnish Cultural Foundation Award, 2009
- Doctor, honoris causa, Tallinn University, 2010

**Honorary memberships:**

- Honorary member, Club of Rome
- WFSF fellow
- Honorary member, Pakistan Futures Society
- Honorary member, Futures Study Academy, Russia
- Honorary member, Finnish Society for Futures Studies
- Honorary member, Turku School of Economics
- Ambassador for City of Turku

**Former principal occupations:**

- Engineer, Imatran Voima, 1959–1960
- Electrical Installations Assistant, Helsinki University of Technology, 1960–1961
- Laboratory Engineer, High Voltage Institute, Helsinki University of Technology, 1962–1963
- Researcher, Finnish Council of Nuclear Power, Ministry of Trade and Industry, 1964–1965
- Professor, Business Mathematics and Statistics, Turku School of Economics, 1966–1997

**Secondary posts:**

- Electrical Installations Assistant, Helsinki University of Technology, 1958
- Academy of Finland Assistant (Erkki Laurila) 1964–1965
- Head of Energy Policy Research Group, Bank of Finland, 1971–1973
- Senior Research Fellowship, Academy of Finland, 1974
- Director, Finland Futures Research Centre, Turku School of Economics 1992–1997
- Principal investigator of FUTU project, Academy of Finland, Finland Futures Research Centre, 1996–1999

### **Memberships and scientific positions:**

- Finnish Society of Technology, member
- Turku School of Economics, Vice Rector, 1971–1974
- Environmental Committee of the Federation of European Engineering Societies (FEANI), founding member, 1971–1975
- Club of Rome, member, 1972–
- Finnish-Soviet Scientific and Technical Committee for Cooperation, member, 1973–1983
- Academy of Ilpo, Turku, co-leader with Ilpo Siro 1978–2008
- Finnish Academy of Technical Sciences, member, 1979–
- Member of Subcommittee for Futures Research, Academy of Finland 1979–1980
- Vice Chair for Government’s Committee for Technology, 1979–1980
- Finnish Society for Futures Studies, Chairman 1980–1989
- Parliamentary Committee Expert, 1985–2010
- Vice Chair for Committee for Futures Research, Ministry of Education, 1987–1988
- Member of Energy Committee, 1987–1989
- Member of NGO Technology for Life, 1990
- Member of General Evolution Research Group 1990–
- Member of World Futures Studies Federation, 1990–1993, President, 1994–1997
- Rockefeller Foundation, Research Grant, Bellagio Research Centre, 2003



**Pentti Malaska – A Visionary and Forerunner** is an intellectual biography of the life and work of Professor Pentti Malaska. Pentti Malaska played a key pioneering role in developing and establishing the academic discipline of futures studies not only in Finland, but also internationally. He took his doctorate in electrical engineering, but his research cut across a range of fields from engineering, business mathematics and operations research through to strategic management, philosophy and deep ecology.

This book provides an insight into the futures research ideas, theories and methods developed by Pentti Malaska. It also addresses some of his key areas of research interest, such as the role of human potential in driving humankind's development and ways of repairing humankind's broken relationship with nature. The book gives a voice to Pentti Malaska's close colleagues and friends, who consider his life's achievements and look back at their collaboration with Pentti.

This volume has been compiled as a tribute to a true pioneer of futures research. Were it not for Pentti Malaska, we would not have such a strong culture of futures studies and foresight in Finland; nor would we have the Finnish Society for Futures Studies; and nor would we have the Finland Futures Research Centre. Our hope is that this book will further awareness about Pentti Malaska's immortal ideas and inspire next-generation futures researchers and other readers interested in building a better world.

"I met Pentti in Dubrovnik where he gave a lecture that was absolutely mind-blowing. It was one of the few truly futures-oriented lectures that were given there in this course on futures studies. And I said this is a tremendous intellect, and a warm person who is able to combine both – the mind and the emotion very well."

- Jim Dator, Director, Professor of the Hawaii Research Centre for Futures Studies

"We were two committed futurists, doing our best to understand and help create futures studies, encourage others to do so too, and even hoped the results of our work might help create a better world."

- Wendell Bell, Futurist, Professor Emeritus of Sociology at Yale University

"It is a truly momentous achievement to establish a new discipline out of nothing and to gain an academic status for that discipline. Without Pentti's resolve and his skills of cooperation, the discipline of futures studies and its institutions would not exist on the scale they do in Finland today. I have no idea who would have undertaken such a venture had it not been Pentti."

- Ilkka Niiniluoto, Academician of Science, Professor Emeritus of Theoretical Philosophy at the University of Helsinki

ISBN 978-951-98852-7-8 (print)

ISBN 978-951-98852-8-5 (pdf)

ISSN 1235-0028