Preface

Concrete examples help to understand complex systems. In this report, the key point is to illustrate the basic mechanisms and properties of *neocybernetic* system models. Good visualizations are certainly needed.

It is biological systems, or living systems, that are perhaps the most characteristic examples of cybernetic systems. This intuition is extended here to *natural* systems in general — indeed, it is *all other* than man-made ones that seem to be cybernetic. The word "biological" in the title should be interpreted as "bio-logical" — referring to general studies of any living systems, independent of the *phenosphere.*

Starting from the concrete examples, connections to more abstract systems are found, and the discussions become more and more all-embracing in this text. However, the neocybernetic model framework still makes it possible to conceptually master the complexity.

There is more information about neocybernetics available in Internet — also this report is available there in electronic form:

`http://www.control.hut.fi/cybernetics`

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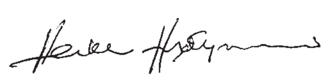
This report is my "scientific legacy", and it is dedicated to my dear sons Elias and Matias, with whom our Adventures no longer can be more than mental ones.

On May 12, 2006 — anniversary of the Finnish Culture



Heikki Hyötyniemi

About the cover

Might is based on Wisdom. And the wisest man of all is Väinämöinen. But the Magic Boat is too large a system to master even for Väinämöinen. He needs to ask help of Antero Vipunen.

Antero Vipunen is the Earth Giant. Things grow on him and in his sleep he absorbs Natures secrets. — What happened then? For details, see Kalevala, the Finnish national epic.

Väinämöinen implementing "experiment design" with Antero Vipunen (graphics by Akseli Gallen-Kallela)

According to Kalevala, knowledge is power. Completely mastering a system is *being capable of presiding over its birth.*

In today's terminology, this all is about understanding the processes of emergence. The contribution of modern cybernetics is that *it may be the same formula to master all systems, big and small, living and man-made.* Knowledge is not only about understanding how systems work — it is about *making them exist* in the first place. — What does this mean? Please, read ahead.

Tunnenpa
systeemin synnyn.

Oleva tiedosta tehty
mielestä on ja mallista

Ajatus aineesta tehty
mitattavasta datasta

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