# VERS LA MACHINE À GOUVERNER

## Herbert Simon and the Impossibility of a Democratic Computer

Présenté et sountenu par :

Carlos Alberto Rivera Carreño

Directeur de mémoire :

Jean-Sébastien Lenfant

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# Contents

# 1

# Introduction

## ACCROCHE: A CONVENTIONALIST EPISTEMOLOGY

In this section, I will briefly discuss the epistemological viewpoint of the thesis, which is that of a conventionalist epistemology. The idea is to claim that the realist epistemology fails to understand what labor is. The alternative is a convetionalist and historical epistemology to explain the construction of the concept.

## METAPHORS IN ECONOMICS

This section will introduce the topic of metaphors in economic thought, since the main issue of the thesis is to provide historical and conceptual elements to understand the transformations of labor in the age of artificial intelligence and computer and information technologies (ICTs).

This thesis takes the position that metaphors and analogies play an important role in the way scientific concepts are understood such as in pedagogical examples and functional analogies.

I will state that both labor and the computer are not things but concepts, and that their definitions must be approached historically. This chapter will define the early computer as a conception of the organization of work that reflects an engineering and managerial mentality. Likewise, this chapter will hint at the link between this conception of work and its definition in law as a relation of subordination.

## STRUCTURE OF THE THESIS

In the last part of the introduction, I will summarize the arguments of the three chapters and hint at the conclusion.

The second chapter will describe Herbert Simon's interest in Babbage, and will speculate on how this reading shaped Simon's conception of the computer, the relation between the natural and the artificial, the changes in work produced by new technologies (artificial intellgence, computers, and automation), and the organization of work in society. Moreover, this chapter will criticize Simon's idea that the organization of work is a purely technical problem to propose an alternative view of

work that emphases other criteria for organization such as justice, etc.

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# 2

# What is Labor?

## MONISM: SOCIETY AND NATURE

In the *accroche*, I will describe how something as self-evident as labor is in fact an ideological construct (ideological in the sense of the anthropologist Louis Dumont, and not in the Marxist sense). Therefore, I will briefly indicate that the concept of Labor begins in political economy and is then appropriated by natural science to be reimported into economic science.

Likewise, I will indicate that the motivation for the the thesis is to rethink what Labor is in the 21$^{st}$ century, taking into account the ubiquity of information technologies.

## RETHINKING WORK IN THE 21ST CENTURY

In this section, I will state the main argument of the thesis: namely, that the origin of the computer is a particular conception of the organization of labor, which we should take into account to understand the transformation of labor (its forms, its meaning, its formal definition in law, etc.) in the 21$^{st}$ century. As such, this argument calls into question the "popular" understanding of the one-sided transformation of labor by the appeareance and dissemination of information and communication technologies (ICTs) in the mid 20$^{th}$ century. Instead, this thesis proposes to read the computer as a technology for organizing labor, to then use this reading to understand the transformation of labor that ICTs are supposedly pushing for.

## CHAPTER CONCLUSION

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# 3

# The Conceptual Origins of the Computer

The first chapter introduces the definition of the early computer as a technology for organizing work. The first objective of this chapter is to question the belief that the appropriate definition of the computer is in terms of its components. The second objective is to acquaint the reader with the history of the early computer by describing the project of the calculation of the logarithmic tables at the *Bureau du cadastre*, and the importance that this project had for Charles Babbage's calculating machines.

concept of the division of labor–as it appears in the pin factory example of the "Wealth of Nations"—to organize a group of hairdressers to produce mathematical tables for the French *Bureau du cadastre*, during the aftermath of the French Revolution. The point is to show that the "computer" is in fact an organization of labor, in which complex calculation tasks are divided into simpler calculation tasks, which are then carried out by unqualified "specialized" workers (or in computer science lingo, by *sub-processes*).

## DID ADAM SMITH INVENT THE COMPUTER?

This chapter will open with Simon and Newell's text, "Heuristic Problem Solving", in which they discuss de Prony's project and it is influence on Charles Babbage.

The introduction to this chapter presents the reader with the story of how Gaspard-Clair-François-Marie Riche de Prony was inspired by Adam Smith's

The first section of this chapter contextualizes the story of De Prony, by providing some background information on him and on the project of the calculation of the logarithmic tables. The idea is to provide an understanding of the significance of the project at the time, and the subsequent significance that it had for Charles Babbage.

## BABBAGE'S THINKING MACHINES

The second chapter will discuss the question at the heart of Babbage's project: Can machine labor replace human labor?

The second section of this chapter connects De Prony's story with Babbage's design of the Difference and the Analytical Engine. The idea is to connect Babbage's ideas on the organization of work and industry with his thought on calculating devices. Therefore, the concept of *mental labor* will be discussed, as it relates to the 20<sup>th</sup> century analogy between mind and computer–which is key to the thought of Herbert Simon.

## CHAPTER CONCLUSION

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# The Bureaucracy as Model Computer

The second chapter describes Herbert Simon's thinking on the computer and organizations to trace the consequences of these ideas into his thinking about the role of artificial systems in shaping the workplace and worker self-determination. Therefore, this chapter will introduce the reader to the importance of Herbert Simon to the field of artificial intelligence, which has been more-or-less ignored by economists–who often only focus on his concept of *bounded rationality*.

## THE MIND AND THE COMPUTER

The introduction of this chapter discusses the ambiguous relation between nature and artifice in the thought of Herbert Simon–specially, as it manifests in his understanding of the mind as a computer. The idea is to give the reader enough background information on Simon's general vision of *things* to, then, discuss his thinking on the nature of organizations (in the first section).

## DICHOTOMY: NATURAL AND ARTIFICIAL

The first section of this chapter connects Simon's ideas on the computer and the mind to his general thinking on organizations. The idea is to pave the way for a political understanding of Simon's more abstract writings on organizations by presenting Simon's own thinking on the concrete social consequences of his vision—which is done in the second section.

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# 5

# Conclusion