Husbands, Holland, and Wheeler (eds): Review of the book "The Mechanical Mind in History"

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Pierre Collet

To start with, I must confess that I am a specialist neither in cybernetics nor in artificial intelligence (even though I teach AI when I have to), so this review was an excellent opportunity to read a book on both. I was a bit disappointed by the contents, mainly due to the ambitious title. The title does not suggest any limits to the book's scope. Indeed, apart from a very interesting chapter on Descartes (French philosopher of the fifteenth century) and another on Josef and Carel Capek and the Czechoslovak play that introduced the word "Robot," the whole book is centered on the very interesting history of cybernetics in England and AI in the US.

A book with a title as definitive as "The Mechanical Mind in History" should have included Japan. I cannot imagine that a country like Japan (that is so much into developing humanoid robots such as ASIMO) does not have a history of cybernetics and AI of its own. I have the feeling that a confrontation of the two cultures, their approaches and their progress in developing a "mechanical mind" would have been very interesting.

But let us get down to the contents of the book, that is made of 14 chapters written by 15 authors, followed by 5 interviews of preeminent figures, conducted by Philip Husbands. As is often the case in edited books written by many authors, some chapters are more interesting than others. In fact, the disparity is such that I could not resist ranking the chapters. Among the 13 chapters, two were exceptional, three were very interesting, four were "only" interesting but not essential, three were dull, and one was (for me) totally unreadable. (It must have put me to sleep at least three times before I decided to skip it.)

This book can be read by someone with only a light background in cybernetics and AI. It retraces its (Anglo-Saxon) history through chapters on Charles Babbage, d'Arcy Thompson, Alan Turing, the Ratio Club, W. Ross Ashby, Gordon Pask, Simon Beer and his Chilean CyberSyn project. Then come chapters that are less

P. Collet (✉)
FDBT-LSIIT, Universite de Strasbourg, Strasbourg, France
e-mail: Pierre.Collet@lsiit.u-strasbg.fr

related to individuals. They include a description of some "steps towards the synthetic method" then a good chapter on the "Mechanization of Art" and another one on the "Robot story". These are followed by two more philosophical chapters, the first one on Descartes and a second on the Heidegger/Merleau-Ponty view of AI.

In my opinion, "The Mechanical Mind in History" is worth buying just for the five chapters that are either exceptional or very interesting. I was most impressed by the chapters by P. M. Asaro "From Mechanisms of Adaptation to Intelligence Amplifiers: The Philosophy of W. Ross Ashby" and H. L. Dreyfus' "Why Heideggerian AI Failed and How Fixing It Would Require Making It More Heideggerian."

In the first of these two chapters, Peter Asaro really managed to convey some great ideas of W. Ross Ashby. For instance, Ashby's use of Darwinism to show that it is possible to design machines that have greater range or skill than that which their designer had given them. How mutation in evolutionary systems can be viewed as an endless stream of information and how Ashby suggests to link an increase in the entropy of a system to the selection of a good solution in order to create an "intelligence amplifier". Intelligence, in Ashby's view, being the power of appropriate selection. This chapter totally convinced me that Ashby was a brilliant mind, who had this rare ability to share his highly pertinent and dazzling views thanks to crystal clear metaphors that were mind openers to me. I will definitely buy some books by Ashby but also some by Asaro.

In the last chapter, Dreyfus sketches a history of AI. He gives convincing reasons why GOFAI (Good Old-Fashioned AI) failed and gives his interpretation of Heideggerian AI and how it is related to the points of view of Merleau-Ponty and Freeman.

In Freeman's neurodynamic model, an animal's perceptual system is primed by past experience and arousal to seek out, and is rewarded by relevant experiences. In contrast, in the Cartesian model, it is up to the brain to interpret and classify incoming information, and, in a second step, to decide what to do. I was totally convinced by Dreyfus' arguments, that Freeman's approach is a better way to build an artificial mind. Here again, this chapter convinced me to read some books and papers by Dreyfus and Freeman.

However, I was not convinced by the quotations chosen by Dreyfus that Heidegger and Merleau-Ponty managed to convey their great ideas with the same crystal clarity of Ashby's metaphors.

In his conclusion, Dreyfus underlines the fact that although Freeman's model seems to be a good one, the designer would nevertheless need to include in his program some needs, desires, pleasures, pains, ways of moving, cultural backgrounds, etc. which casts a doubt on whether it will ever be possible to build a mechanical mind. However, after reading this chapter I will very probably start a research project related to its contents with a colleague.

There seemed to be an argument between Dreyfus and Wheeler on their vision of Heideggerian AI. Unfortunately, Wheeler's chapter (which I ranked among the "very interesting") is on a different subject (Descartes) and so I had no opportunity to read Wheeler's point of view. This is a pity, seeing how Dreyfus' chapter got my interest.

Five interviews follow with John Maynard Smith, John Holland, Oliver Selfridge, Horace Barlow and Jack Cowan. The interviews are well directed by Philip Husbands, so they are quite interesting, although mostly from a historical point of view.

All in all, I think this is a quite interesting book on (the anglo-saxon history of) cybernetics and AI. As a non-expert in this field, I learnt many things, and I am happy to have read it.