On the Foundations of Artificial Intelligence and Human Cognition

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One of the fundamental assumptions of artificial intelligence is the hypothesis that machines can, in principle, be built to understand human language. This thesis argues that this hypothesis is wrong.

Concretely, the proposition we establish reads: let, an ideal robot, R, be a robot which: a) is equipped with human sensors or robot sensors functionally-equivalent to human ones; b) is able to manipulate human linguistic data; and c) is able to connect in any way a) with b). Let, furthermore, R be constructed; then, R is, in principle, unable to understand human language and we, humans, can never improve R to understand human language.

In developing our argument, investigation of the foundations of human cognition, and in particular the notions of meaning and understanding has been found necessary. Our analysis of these notions has led us to propose, in rough outline, an explanatory theory of meaning, as the first step towards a unified treatment of human cognition.

Our work is Cybernetically materialistic. By this we mean that: one, it is based on the materialistic tradition as this is expressed by what we believe to be its four main characteristics: (i) the materialistic assumption, (ii) the evolutionary hypothesis, (iii) the principle of causality, and (iv) the synonymity assumption. Two, it adopts the Cybernetic methodology as this was conceived by Norbert Wiener and Arturo Rosenblueth.