

**Title:** *Mechanistic and non-mechanistic elements in Alan Turing's conceptions*

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### **ABSTRACT**

In 1936, Alan Turing defined his concept of a mechanical calculation procedure, for which he used an abstract – albeit physically implementable – computing machine known today as the Turing Machine (TM). According to his approach, a procedure is ‘effective’ if it can be described by a specific scheme of finite computation steps. These steps could be accomplished by a human ‘computer’ and a TM in a formally analogous fashion. Turing’s definition created a blueprint for mechanistic explanations in computational terms, raising but conspicuously not answering questions of their scope concerning human actions or other goal-directed processes.

In many of his works and public statements, Turing expressed a strong commitment to explanations in the style of computational mechanism, which he also assumed to apply to human mental activity. Although he found such explanations to be largely sufficient in most domains, his mechanistic account of computation was never supposed to cover problems outside the domains amenable to effective procedures. Most significantly, by recruiting the relevant abilities of human computers in his design of TMs, Turing did not imply a verdict on all human cognitive abilities. More concretely, he singled out essential domains that are at least partly unamenable to describe and explain in computational-mechanistic terms. These include (a) processes of organic pattern formation or ‘morphogenesis’, which partly depend on random factors (Turing 1952); (b) brain development and learning, which depend on partly indeterministic interactions with the environment (Turing 1948, 1950) (c) mathematical reasoning, which requires an element of intuition, for which he introduced the non-mechanistic notion of an ‘oracle’ (Turing 1939); (d) extra-sensory perception, which he treated as a factual objection against the possibility of machine intelligence (Turing 1950).

### **References**

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