Hofstadler 1985

Main summary:
Cognition is the easy problem, the representations and sub-cognitive computations that allow for fluid, human-like cognition is the real division between hard and soft AI, or intelligent and algorithmic systems.

Intro
-Searle's Chinese Room problem as the foundation for the articles' main argument

Background
-sub 100ms processes are yet to be adequately understood
-letter forms(more than just recognition) as a 'frictionless' toy system illustrating the importance of sub-cognitive processes

Cognitive vs. sub-cognitve
-current, high level cognitive solutions involve contrived/controlled scenarios. Systems don't learn in an abstract domain they learn particular instantiations
-anagrams as a toy dataset(seems like the problem hofstadler was currently working on), and how human architecture(working memory) can be used to inform how the underlying mechanisms might be recruited.
-sub-cognitive(or sub-conscious) processes are inherently hidden from us, and therefore we haven't agreed upon a model of how they 'should' work. The only way to effectively approximate these processes, then is to produce systems isomorphic to the human hardware/mechanisms

Symbols
-ant colony metaphor(collective phenomena); individual ants have no knowledge of the message their group is conveying to the colony, similarly individual groups naively coordinate together to represent information
-active vs. passive symbols
        -neuron is passive(ant)
        -representations are active(groups)
        -systems are super-active(groups of groups)?
-current AI approaches treat all symbols as passive, and behave as symbol manipulators
-human intelligence emerges from the symbols simply being active, and the natural cascading of their activation to other symbols
-these active symbols are sub-cognitive and do not 'symbolize' in the cognitive way that AI generally attempts to characterize them(i.e. Searle's argument)

Intuitive physics(exact vs. generalized solutions)
-symbols with halos (cluster of alternative versions of itself)
-active symbols depend on it constituents to behave semi-randomly to provide these halos, and the statistics of the group will reign them into coherency
-emergence of meaning(cognition) occurs through the statistics of the passive symbols groups form active symbols, which also transcend their individual role to fit into larger super-active symbols, and so on
-cognition emerges from statistics of the passive symbols and not the formal logic of current AI approaches