Artificial Life: Route to A.I. (Steele & Brooks, 1995)

1. Focus: exploiting biology for modeling
   Cognition = having body with sensorimotor capacities

3. Cartesian Trap: Early A.I. = Abstractions + Representations
   - New: no central foundations / categories
   - Old: strong engineering = prior to new mechanisms to handle

11. Emerging view: knowledge = primarily concrete / embodied / abstract
    Brain: AI = non-logical = patchwork networks

19. Always operate in some kind of immediacy
   - micro: identity / micro: worlds = hx: constituted

28. GOFAI: Robots = sense-plan-prebuild worlds = sense-model-plan-act
    - Most CPU = perception - Least = plan / act

1984: post-GOFAI
   - Routines / planning / solving
   - Inventions / symbolic
   - Agents in real world

intelligence = limited to computational >> emergence

30. Computers: high speed / low state processing
    biological: low speed / massively parallel

32. A.I. = Embodiment

36. Most: GOFAI = search issues
   - try to program on existing computers

38. Cybernetics = all possible machine behaviors
   - input / output / black box
   - original computer model = analog / to symbolic search

50. Neural Science: misleads into simplistic connectionism

53. Agents: problem-solving / real life

55. Embodiment: world grounds regress
   - physical provides hx: based meaning

57. Intelligence: determined only by total behavior with environment

63. Maps: not necessary

85. Autonomous = self-controlling
   - must = relevant self-knowledge + motivation

89. Mechanistic = no explanatory theories

99. Synthesis: method, construction using theory
   - beyond simulation
112 **Autonomous**: able to 
capabilities and achieve tasks
- master of degree
- AI + related: intelligent systems = I.R. systems = Dogma
  - Newell + Simon: symbolic RAM
  - Connectionism: rejects symbol manipulation, but remains I.R. model
  - Same: Cog, Pych, Gibson, Cybernetics
  - Ethology: I.R. language
  - Neuroscience: 

125 a. Info. Theory: most profitable investments in AX
  
128 Newell, Simon = No Shannon
  - Abstraction: how is communicated = absent
  - Eliminates concern with some environment
  - Assumes agent reads info. given by environment
  - Compares senior issues to engineers (relegation)

130 I.R. model
  - Formal Turing I.R. model
  - Autonomy: necessary, not sufficient cond. for Intel.
  - Dynamic vs structural problem
  - Material + abstracted away

136 Senior centered analysis
  - pick out info. / decay signal / history = dynamics control program
  - Dynamic complexity

140 Other parts can provide data (matter)
141 Brain processes a dynamical no Formal
  - Classical interaction: agents interact with external world
  - System = categorization = modeling
  - Internal space: combination: agent / environment

166 Distributed no Subsumption

191 Automaton vs. Autonomous:
  - Autonomous = completely controlled by outside agent
  - Both: make decisions = decision criteria = important

198 DM by rules vs. DM by cognition
  - Indirect dependence on humans

213 Early views: intelligence, perception, action = inseparable
219 No def. of intelligence

216 Neural networks: are symbolic + representational as GPX

218 Basic level = required programming
  - requires programming: hypothesis
  - General learning mechanisms

230 Hybrid & Modular (obj. oriented) = % complete agent
  - Biominning: assumption: animals = I.R. systems