

Tools for Thought
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Caleb Ames

Computers as “tools for thought”

- the Englebart inspiration
- electronic communities are an important tangential theme, followed up elsewhere
- following the thread of self-augmentation

Babbage, Lovelace & Boole

- Babbage's universal calculating machine
- Ada's observation that it is an engine for manipulating symbols
- Boole's bridge between mathematics and logic
 - "the Universe" and "Nothing"

Alan Turing

- “Axiomatic systems” and “formal systems” - algorithms for mathematics
 - “to prove that mathematical truths could be reduced to logical truths”
 - the “Turing machine”
- Software and self-modifying programs
 - machines built upon machines, programming languages
 - the “Turing test”

John von Neumann

- an enabler for the increasingly team-oriented work done in computing
- the “von Neumann architecture”
 - processing unit
 - memory device
 - i/o devices
- self-reproducing automata
 - “anti-entropic swarms of logical locusts”

Norbert Wiener

- Communication and control in anti-aircraft guns
- Feedback loops and cybernetics
- Pioneer in communication theory - message/noise, order/disorder, “information is entropy”

J.C.R. Licklider

- “Man-machine symbiosis”
- many thinking tasks are clerical or mechanical and may be automated
- proponent of interactive computing and invention of time-sharing

Bob Taylor

- “The Computer as a communication device” with Licklider
- From time-sharing to personal computing
- “Communities not of common location but of common interest”

And others...

- Claude Shannon and logical switches
- Alan Kay and the “fantasy amplifier”
- Ted Nelson and hypertext
- Brenda Laurel and virtual space