Overall I really enjoyed this book. I saw a lot of neat ties from my life to Turing: commitment to run, interest in AI, and passion for math.

Three words to sum up Turing: Humor (impish and infectious), Courage, and Isolation (love to work alone).Three other words: Patriotic, Unconventional, and Isolation.

Turing and the printing problem on well-defined mathematical problems that cannot be solved by a finite computing machine. One of these is called the printing problem. No problem can solve simple problem of predicting if running a program will cause Turing machine to print out a 0 or 1 on the tape.

Godel and Turing both challenged Hilbert in his flawed thought of a universal supreme systematic procedure for settling truth or falsehood in mathematics. If Hilbert was right a universal turing machine could exist to carry out systematic procedure, but Turing determined this is not possible (no such procedure or system exists also by Godel's incomplete theorem). Hilbert wanted math to be 'kontrolliert - controlled'. Intuition could be controlled by forbidding its use except in very special circumstances - a bit like forbidding the remarriage of divorces except to a member of the royal family. Turing saw that in this way it might even be possible to circumnavigate Godel's incomplete theorem.

Entschediungsproblem (problem of mechanical decidability) with Newman showing idea of early inkings of a mechanical machine that could determine if problems were solvabale / provable. This was referred to as 'the calculus of propositions'.

Introducing Bolshevism into mathematics to describe geopolitcal tensions going on (early ww2) with a professors lectures Turing disagreeing on ideas debating (Wittgenstein).

'The situation in which no word given by Germany's ruler could be trusted an dno people or country could feel itself safe, had become intolerable.'

Turings work weakened Uboats holding on North Atlantic which could have shaved ~2 years of the war.

Enigma (Hitler not the same one time typing vs. second letters lit up a ciphertext). Some preamble info transmitted (calsign, time) and the ciphertext in morse code then decoded on the other side. Letter subsitions were reversable (encode / decode methodology)

Marian Rejewski 'pensive-man with owl-like circular spectacles' managed to deduce the wiring beside the wheels. This was one of the greatest feats in history. Done by analyzing pictures taken by french inelligence!

bigram table to look up codes (kind of related to category theory as sending pairs of letters matching other letters). Idea of a message indicator being used to transmit the information. German vessel used what is called a crib (snatch of plain german codebreakers could use to contextually get part of a message and infer the rest / other context)

Boat sabotages (pinches) used to get bigram tables and take things away for instance, Schiff 26. They would throw the eniga overboard to save secrets, but some documents recovered that were floating giving crucial decoding information.

Many women helped fuel efforts at bletchley, such as Joan Clarke.

Turings bombe used Enigma machine replicas to decode the messages from the Engimas.

Hut 6 was given access to the 2nd Bombe named Agnus, short for Agnus Dei, the Lamb of God. According to the Gospel of St John, the Lamb of God would take away the sins of the world. Biblical allusion was missed by those who heard Angus as Agnes and became universally as Aggie.

Term called Banburismus - three B's - bigram tables, bombes, banburismus all devised by turing to solve dolphin indicator problem. Banbury being an Oxfordshire town where a small workshop produced the special punched paper strips that Turing needed to put his method into practice. This method exploited if two stretches of Dolphins papers were superimposed on top of each other the chance of two letters being the same was 1/17 rather than 1/26 (if just randomly selected). Jack Good was 'good' at this game and wrote a book called 'Good Thinking'. Prided himself on picking the right word. He called Hitler, 'the megamurderer.'

1942 US enters war. 'There's nothing wrong with the Americans,' the English enjoyed complaining, 'apart from them being overpaid, oversexed, and over here.'

Hag cipher child of Boris Hagelin italian engineer was much less secure that Enigma.

Donald Michie came to Bletchley Park at 18 and notced that Michie was a cocky schoolboy of eighteen when he joined Bletchley Park. When I knew him better I realized that his emotions were so child-like an dfunamnetally good as to make him a very vulnerable person in a world so largely populated by self-seekers.

Turing left in Nov. 1942 went to work at Bell Labs 'vocoder' system with SIGSALY.

Tunny picked up more interest and difficult to decode. Tunny had more complexity, the indicators had 12 names. Repeating the same message twice with different typos was for some reason extremely advantageous for codebreaker 'a codebreaker's dream'. Tutte discovered structure 3 groups: one of the 'chi wheels' generated letter stream were called the 'psi-wheels' generated other stresam and remaining 2 called the motor wheels regulated movement.

Turingery built a bit more on insight than on math - depended on what you 'felt in your bones'. Once structure was determined, the turingery strategy was used.

Tommy Flowers used was the man behind the first computer and the hardware which could use deltaing algorithm to crack the Tunny. Turing found turingery, but tommy flowers took the idea and made it possible at scale through vacuum tubes or valves (english). Could be done more robustly by using less current in the valves and leaving them on for longer.

Overlaps between banburismus and baye's theorem or conditional probability and statistical inference (using aforementioned details).

Turing made his own computer and continued working on challenging problems after the war. Flowers influenced Turing profoundly in these regards of showing the vast possibilities in intelligent computing systems and his own ideas of the universal computing machine, etc. As the war came to close he had adroitly grasper opportunity to head th emath at NPL (national physics labratory. He was recruited by Wormselry, but basicall y alot of disagreements on computers and ideas led him to ultimately leave.

Many themes of people not getting credit where credit was due, Eckert and Mauchly, Flowers, Turing, etc. in Von Neumann's vfamous document EDVAC 9 Electronic Discrete Variable Arithmetic Computer).

'How to Win Friends and Influence People' Wormsley kept a copy of this in his office.

ACE - automatic computing enginer

Engineering firm called Ferranti first american built commercial machine available Eckert-Mauchly UNIVAC-1. Kilburn workin on also the Atlast, an early supercomputer.

"Hyperboloids of wondrous Light
 Rolling for aye through Space and Time
 Harbour those Waves which somehow Might
 Play out God's holy pantomine."

Christopher Stratchy

Manchest computer playing draughts (checkers). AI systems start to pique peoples interest. Rod Brooks director of AI at MIT (* impossibly energetic Australian with an easy manner).

Human intelligence is marked by the 'ability to make a plausible shot at almost anythign.' - Donald Michie

Turing said that, 'The extent to which we regard something as behaving in an intelligent manner,' he said, 'is determined as much by our own state of mind and training as by the properties of the object under consideration.'

Joe Weizenbaum, an MIT Hacker, writes the Eliza program (interactive to human input with preset outputes and inference).

GPS (general problem solver) over a decade desired for computers to search intelligently for their own solutions to problems. Herbert SImon and co-researches Allen Newll and Cliff Shaw led the project. Notorious cannibals and missionary problem folows...

Michie develops Frederick: Friendly Robot for Education, Discussion and Entertainment, the Retrieval of Informaiton and the Coallition of Knowledge': FREDERICK.

London 1947 Turings and first lecutre on AI. 'What we want is a machine that can learn from experience.' In this lecture he had early predicitions of the internet communications through telephone lines to control a distant computer.

AI researchers called this idea 'heuristics'-ordinary english for rule of thumb. Programming computers to take general rule of thumb ideas to winning (reduces complexity, but tradeoff is more often wrong). This kind of akin to pattern matching and we do it in our brain as well. However, sometimes this fails and did fail in same logic employed at times in Turing's Bombe.

Ray Kurzweil predicting intelligence explosion (when machines can learn by themselves in a feedback loop kind of like simulated evolution but lack of time cost).

Turing with David Champernowne 'TurboChamp' first AI program to beat humans in chess.

Turing's theory called 'reaction-diffusion' when investigating chemitry/biology behind shaping our biological growth etc. Simple idea behind this is a wavefront that chases its own tail. When this happens chemical waves can form stationary peaks and wave-crests evenly spaced around a circle can form concentration of chemicals where growth can be stimulated. Turing proposed this for regualrly spaced tentacle in an organism called a Hydra. This was first notion of investigative field now known as artificial

life.

Christopher Langton - 'the study of man-made systems that exhibit behaviours characteristic of natural living systems.'

Does the human head contain a computer? 'the brain has a consistency of cold porridge' - Alan Turing. Neural processing and parallel processing allows less energy but more inference and determination through multiple routes being processed. Slaves looking at processes in unison compared to neurons firing.

1954 Belmont Farley and Wesley Clarck at MIT succeed in running the first computer sims of neural networks.

The turing test
- the linda test
-
- chinese thought room experiment

- turing had to do chemical therapy after the man he was sleeping with stole some money and took to the police office

- cyanide poisining really the cause of turings death? lots of strange details and could have been killed as assassinations were going on during mcarthyism and fears of communism taking advantage of secrets from wars for power, etc. shoes left outside door, wrote his will in previous months, but also wasn't depressed and in mid-40s. He was very intentional about payment plan updates for his custodian which was strange if he had planned to kill himself, etc.