Wolfgang Hagen
The Radio and the "Aprophecy" of the Digital

As Alan Turing, whom I don't have to introduce to anyone here, I think; from whom the logical concept of the computer originates; namely the construction of a certain type of thought machine, designed to prove that this machine cannot prove that a machine of this type works properly; which is often forgotten: The digital, as far as the computer is concerned, is based on a negative evidence! The computer is the proof that a computer cannot prove that a computer is running properly!

... when Alan Turing, the father of the digital, if you like, realized after the war he had won as a code-breaker, that he would not be allowed to really build the computer he had invented, because he was said to be gay and therefore susceptible to blackmail by the Soviets, - Turing developed what would later be called the "Turing Test". A test that required no less clarification than the question: What is thinking?

“I propose to consider the question, ‘Can machines think?’ This should begin with definitions of the meaning of the terms ‘machine’ and ‘think’”

At least the first half of the question was something Turing could laugh at. He was probably one of very few people who knew which machine was at stake: computers that could calculate everything that was calculable and what a person could calculate if he was given enough time, even if it was his whole life and ten or a hundred lives long. Computers are what we have today: Deep learning machines, data science algorithms, big data cruncher. As Michal Kosinski recently showed at Stanford, a good 100 Facebook Likes are enough, and you know more about a person's inclinations than the next of kin.

So there remains only the question of thinking and that is: What is thinking?

The trick to find an answer is typical of Turing. A game, a question-and-answer game. On the one hand a person asking questions, on the other two competitors: a person and a computer, each answering separately. In between there is a blind and an acoustic separation. All questions must therefore be asked and answered by telex. Man and computer answer and in the end the questioner decides which of the two thinks like a man, which therefore showed thinking and which does not.

Turing's legendary and for computer culture crucial definition of what thinking is is a process of determining how thinking manifests itself, how thinking articulates itself,

1 Radiophones Funkkolleg II: Die Störung der Zukunft, HKW Berlin, 1.11.2018.
how it expresses itself; not so much what it is. Thinking is only what appears to be thinking - that is also deeply embedded in the core of the epistemology of the digital. Turing could have adopted this definition of thinking from Charles Sanders Peirce or William James, but he did not. And it is, as so often, not even certain whether he knew predecessors of his thinking about thinking at all. Whether Turing Peirce or James ever read, even lifelong Turing researchers like Andrew Hodges\textsuperscript{3} or B. Jack Copeland\textsuperscript{4} have so far found no evidence of this..

His 1950 text, "Computing Machinery and Intelligence", which I am talking about here, has earned Turing the honorary title of the inventor of "AI", Artificial Intelligence. And more than that: What is Google, for example, other than a big Turing test? All the answers Google gives are given by machines. And, as Elena Esposito once said, they are "memories that have not yet been thought of," that is, oscillations of thought in a certain sense. So we don't have to ask ourselves so much whether the Turing Test would stand the test today. On the contrary, we should keep in mind: with Alexa and Siri, with smartphone sensors and geolocal navigation, we have already long entered the daily Turing test.

But in 1950, of course, all this is completely new and still quite precarious. You might think it was charlatanry. Turing gives the Prophet because he is sure that computers can be more than big fast calculating machines for special mathematics. But isn't that ridiculous? If he had claimed at this time that later one would only call "Alexa, play weekend and sunshine" into a room, and then the Commedian Harmonists would sing, one would probably have had a laugh at him.

Therefore Turing discusses objections to his Turing test, which one could raise, and which he of course immediately disproves. There are nine objections, but the last one, the ninth one, somehow actually gives him a hard time. It's "The Argument from Extra-Sensory Perception." ESP, extra-sensual perception, i.e. the quadriga of clairvoyance, prophecy, psychokinesis and telepathy. - "thinking is just the kind of phenomenon where E.S.P. may be especially relevant."

So what if a person with telepathic abilities were sitting behind the wall, next to the machine, and therefore always knew, for example, which playing card the questioner was holding in his hand. No kidding, Turing's dealing with this problem seriously. Because against psychics a computer would be lost. The machine can probably generate random numbers - and in fact, based on Turing's expertise, one of the first com-

\textsuperscript{3} Hodges, Andrew (2013): Alan Turing, Enigma, 2. Aufl., Wien : Springer Wien.

\textsuperscript{4} Copeland, B. Jack (2012): Turing - Pioneer Of The Information Age, Oxford University Press.
puters in England got a "random number generator" - and score a few hits. But perhaps the machine itself is manipulated because the spiritualistic medium, clairvoyant, prophet, or whatever, has telekinetic powers, can levitate tables, and thus also influence the computer.

Extra-sensory perception, telepathy, levitation, psychokinesis? Turing believes in it: "The statistical evidence, at least for telepathy, is overwhelming" he says. "It is very difficult to rearrange one’s ideas so as to fit these new facts in" and his description of the tricky situation takes the path across the analogy of an Ear Man: "The situation could be regarded as analogous to that which would occur if the interrogator were talking to himself and one of the competitors was listening with his ear to the wall."Now it's an eavesdropping, not a Turing test.

Before I name the somewhat odd solution Turing invents for his dilemma, I will try to clarify why Turing thought ESP, clairvoyance, or telekinesis were scientifically debatable facts. Since he does not care about sources here either, only the term "ESP" can give a first hint. He was written by Joseph Banks Rhine, an empirical psychologist at Duke University in the USA, in 1934. Even a decade and a half later, his research was legendary. C.G. Jung mentions them praises; another exuberant supporter was the quantum physicist Wolfgang Pauli - without whose discovery of the electron spin we would not have any silicon chips today. Rhine had had thousands of test persons guess 5 different playing cards with special symbols and found out telepathically talented people among these test persons, who could name the correct card symbols beyond all statistical probability.

In Princeton, Rhine's experiments were immediately replicated, which failed completely, and no other American university was able to reproduce his results. What the matter should have been settled scientifically would not have been a mathematician at the Queen Mary College of the University of London, Samuel Soal by name, who had also employed 120 thousand number and card games of this kind, for five years, until the war with Germany, with allegedly positive telepathic findings, most of which decades later were exposed as fraud. But Turing couldn't have known that in 1950.

Both Rhine and Soal were leading members of the Society for Psychical Research, the legendary organization of scientific research into spiritism from 1880 on-

---

wards, in which hundreds of renowned scientists from Europe and the USA were represented, all of whom were, however, consistently inclined towards spiritualistic findings. Among them was Sigmund Freud, who absolutely wanted to be accepted into society, but failed. The three founders of the Society, Sidgwick, Gurney and Myers, were like Turing graduates of Trinity College in Cambridge and were thus held in the highest honours where Turing had written his computer essay. Myers had coined the term "telepathy", supported by the empirical research of a certain Oliver Lodge, of whom none other than Heinrich Hertz said, if not he himself, then this Lodge would have discovered his "rays of electric power", that is, what was called radio waves from 1888 onwards, caused a sensation in the First World War as radio telegraphy and still carries our electronic media today. 8

Which brings us to the core of the matter, namely the fundamental epistemological confusion caused by electricity, its effects and its media from the 19th century into the early 20th century, i.e. telegraphy and radio. From 1850 electric telegraphy was in operation in Europe and the USA, from 1870 its submarine cables in the oceans, without anyone being able to explain even the slightest physical effect by which electricity could be explained. 9

Already with telegraphy a new variety of spiritism had penetrated the cultural and scientific world first of the USA, then of England, namely the so-called "modern spiritism", with countless knock-spirit media to take up the alleged communication with the deceased, observed by serious scientists also from the science academies, who were under pressure, because rulers and governments, but also the population in the growing industrial nations, demanded to know what this 'ether' was all about, which, hard as diamond, and at the same time penetrating all physical bodies, propagates the electromagnetic waves in its disturbance as disturbed medium. This was the legendary theory of Thomson, Helmholtz, Hertz and Lodge, the leading elites: Radio waves are ether vibrations and ether disturbances. Why shouldn't the spirit of the dead also remain in the ether and be perceptible for telepathic people? 10

---


As far as the empirical evidence for such claims is concerned, Lodge had already developed the pattern of all subsequent expert reports in 1884.\textsuperscript{11} To prove "Thought Transference", Lodge, analogous to the Turing test, placed the agent who painted a figure in front of the screen, for example a circle with a cross in it, and behind it the receiver who had to paint on what the agent saw. Mute, silent, without a word. Hundreds of investigations of this kind are found in the Proceedings published by the Society of Psychical Research, volumes 1884 and following. For Lodge, who later claimed to communicate with his late son via a trance medium named Gladys Osborne Leonard,\textsuperscript{12} proof that thought transfer works. Theoretical explanation: Thoughts are not in the head, but there are ether vibrations around the head, very weak, but can be picked up by sensitive receiver heads. Thought transfer as a radio program. "Mental Radio," as Upton Sinclair describes it half a century later in his own way.\textsuperscript{13}

In 1927, the thing actually goes onto the radio. February 16, BBC, Lodge sits down in the studio and asks the listeners to press their ear close to the device. Then they shall paint the picture that Lodge thinks of and send it to him. And then guess playing cards again. Everything goes wrong, but the show becomes legendary.\textsuperscript{14}

A few months later, repeated in Germany, Funkstunde Berlin, 16 October 1927. Here too the result is negative - the card reading does not work. All this critically described by one of the originators of the program, Alexander Herzberg, the co-founder of German Gestalt psychology, with the words: "Meanwhile, the psychic media, [...] they could exist, but they did not need to be among the participants of our experiment; therefore the experiment does not prove anything against the possibility of psychic vision."\textsuperscript{15}

I'm coming to the end. We learn: The Turing test is built according to the modified pattern of a spiritualistic test that deals with thought transmission. Here the agent, only on the other side now two receivers, computer and human. Turings prophecy is


\textsuperscript{12} Vgl. Lodge, Oliver (1906): The Proofs Of Life after Death, Boston.

\textsuperscript{13} Sinclair, Upton (1930): Mental Radio, Preface By Albert Einstein, Springfield: Thomas.


that this setting will prove that computers think. To immunize this test against its origin as a telepathic scene, Turing comes up with only one solution: "To put the competitors into a 'telepathy-proof room' would satisfy all requirements."\textsuperscript{16} The most important question remains open: How do we build telepathically safe spaces when we don't even know what telepathy is because any telepathic knowledge, if there was such a thing, is itself unsettled by telepathy?

In the end, only one finding remains: Turing tests and applications of an artificial world of computers do not work when prophecy is involved. Computers only operate with a thinking that they can reproduce themselves. They are never prophetic because they can only act by prediction, they can only statistically forecast, make prognoses by random operations, data structures and probability algorithms. The digital is a-prophetic and un-telepathic by definition.

In the end, Turing himself no longer worked on computer theories, but on biological self-organisation and mathematical chemo- and bio-morphogenetics. Therein he describes first, quite general outlines of a mathematical theory of embryology as well as the simulation and prediction of autonomous growth molecules. From his earliest texts from his teenage years to his last works, it follows that Alan Turing's prophecy was always and remained until his early death: At some point, somehow, what we call life, spirit and soul will be predictable.

On the way, he developed the logic of the computer to show that this goal cannot be achieved with it.

This a-prophetic prophecy, it seems to me, is his real legacy.