Ten 100-year predictions that came true

In 1900, an American civil engineer called John Elfreth Watkins made a number of predictions about what the world would be like in 2000. How did he do?

As is customary at the start of a new year, the media has been full of predictions about what may happen in the months ahead. But a much longer forecast made in 1900 by a relatively unknown engineer has been re-circulating in the past few days.

In December of that year, at the start of the 20th Century, John Elfreth Watkins wrote **a** piece published on page eight of an American women's magazine, Ladies' Home Journal, entitled: "What may happen in the next hundred years". He began the article with the words: "These prophecies will seem strange, almost impossible", explaining that he had consulted the country's "greatest institutions of science and learning" for their opinions on 29 topics.

Watkins was a writer for the Journal's sister magazine, the Saturday Evening Post, based in Indianapolis. The Post brought this article to a modern audience last week when its history editor Jeff Nilsson wrote a feature praising Watkins' accuracy. It was picked up and caused some excitement on Twitter. So what did Watkins get right - and wrong?

10 predictions that Watkins got right...

1. Digital colour photography

Watkins did not, of course, use the word "digital" or spell out precisely how digital cameras and computers would work, but he accurately predicted how people would come to use new photographic technology.

"Photographs will be telegraphed from any distance. If there be a battle in China a hundred years hence, snapshots of its most striking events will be published in the newspapers an hour later.... photographs will reproduce all of nature's colors."

This showed major foresight, says Mr. Nilsson. When Watkins was making his predictions, it would have taken a week for a picture of something happening in China to make its way into Western papers.

People thought photography itself was a miracle, and colour photography was very experimental, he says.

"The idea of having cameras gathering information from opposite ends of the world and transmitting them - he wasn't just taking a present technology and then looking to the next step, it was far beyond what anyone was saying at the time."

Patrick Tucker from the World Future Society, based in Maryland in the US, thinks Watkins might even be hinting at a much bigger future breakthrough.

"'Photographs will be telegraphed' reads strikingly like how we access information from the web," says Mr. Tucker.

2. The rising height of Americans

"Americans will be taller by from one to two inches."

Watkins had unerring accuracy here, says Mr. Nilsson - the average American man in 1900 was about 1.68-1.70m (66-67ins) tall and by 2000, the average was 1.75m (69ins).

3. Mobile phones

"Wireless telephone and telegraph circuits will span the world. A husband in the middle of the Atlantic will be able to converse with his wife sitting in her boudoir in Chicago. We will be able to telephone to China quite as readily as we now talk from New York to Brooklyn."

International phone calls were unheard of in Watkins' day. It was another 15 years before the first call was made, by Alexander Bell, from one coast of the US to the other. The idea of wireless telephony was truly revolutionary.

4. Pre-prepared meals

"Ready-cooked meals will be bought from establishment similar to our bakeries of today."

The proliferation of ready meals in supermarkets and takeaway shops in high streets suggests that Watkins was right, although he envisaged the meals would be delivered on plates which would be returned to the cooking establishments to be washed.

5. Slowing population growth

"There will probably be from 350,000,000 to 500,000,000 people in America [the US]."

The figure is too high, says Nilsson, but at least Watkins was guessing in the right direction. If the US population had grown by the same rate it did between 1800 and 1900, it would have exceeded 1 billion in 2000.

"Instead, it grew just 360%, reaching 280m at the start of the new century."

6. Hothouse vegetables

Winter will be turned into summer and night into day by the farmer, said Watkins, with electric wires under the soil and large gardens under glass.

"Vegetables will be bathed in powerful electric light, serving, like sunlight, to hasten their growth. Electric currents applied to the soil will make valuable plants to grow larger and faster, and will kill troublesome weeds. Rays of coloured light will hasten the growth of many plants. Electricity applied to garden seeds will make them sprout and develop unusually early."

Large gardens under glass were already a reality, says Philip Norman of the Garden Museum in London, but he was correct to predict the use of electricity. Although coloured lights and electric currents did not take off, they were probably experimented with.

"Electricity certainly features in plant propagation. But the earliest item we have is a 1953 booklet Electricity in Your Garden detailing electrically warmed frames, hotbeds and cloches and electrically heated greenhouses, issued by the British Electrical Development Association.

"We have a 1956 soil heater, used in soil to assist early germination of seeds in your greenhouse."

7. Television

"Man will see around the world. Persons and things of all kinds will be brought within focus of cameras connected electrically with screens at opposite ends of circuits, thousands of miles at a span."

Watkins foresaw cameras and screens linked by electric circuits, a vision practically realised in the 20th Century by live international television and latterly by webcams.

8. Tanks

"Huge forts on wheels will dash across open spaces at the speed of express trains of today."

Leonardo da Vinci had talked about this, says Nilsson, but Watkins was taking it further. There weren't many people that far-sighted.

9. Bigger fruit

"Strawberries as large as apples will be eaten by our great-great-grandchildren."

Lots of larger varieties of fruit have been developed in the last century, but Watkins was over-optimistic with regard to strawberries.

10. The Acela Express

"Trains will run two miles a minute normally. Express trains one hundred and fifty miles per hour."

Exactly 100 years after writing those words, to the very month, Amtrak's flagship high-speed rail line, the Acela Express, opened between Boston and Washington, DC. It reaches top speeds of 150mph, although the average speed is considerably less than that. High speed rail in other parts of the world, even in 2000, was considerably faster.

...and four he didn't

1. No more C, X or Q

"There will be no C, X or Q in our everyday alphabet. They will be abandoned because unnecessary."

This was obviously wrong, says Patrick Tucker of the World Future Society, but also remarkable in the way that it hints at the possible effects of mass communication on communication itself.

2. Everybody will walk 10 miles a day

"This presents a rather generous view of future humanity but doesn't seem to consider the popularity and convenience of the very transportation breakthroughs [moving sidewalks, express trains, coaches] forecast elsewhere in the article," says Mr. Tucker.

3. No more cars in large cities

"All hurry traffic will be below or above ground when brought within city limits."

However, many cities do have pedestrian zones in their historic centres. And he correctly forecast elevated roads and subways.

4. No mosquitoes or flies

"Mosquitoes, house-flies and roaches will have been exterminated."

Watkins was getting ahead of himself here. Indeed the bed bug is making a huge comeback in the US and some other countries.

Maybe the end of the mosquito and the house fly is something to look forward to in 2100?

And some other Watkins forecasts

- Central heating and air conditioning
- Cheap cars
- Average life expectancy to rise to 50
- Free university education
- Refrigerated transport of food

Who was J Elfreth Watkins?

- Lived from 1852-1903
- Was a railroad engineer until he suffered a 'disabling' accident in 1873
- After that, became a clerk for the Pennsylvania Railroad
- In 1885, took a job as curator at the transport section of the US National Museum