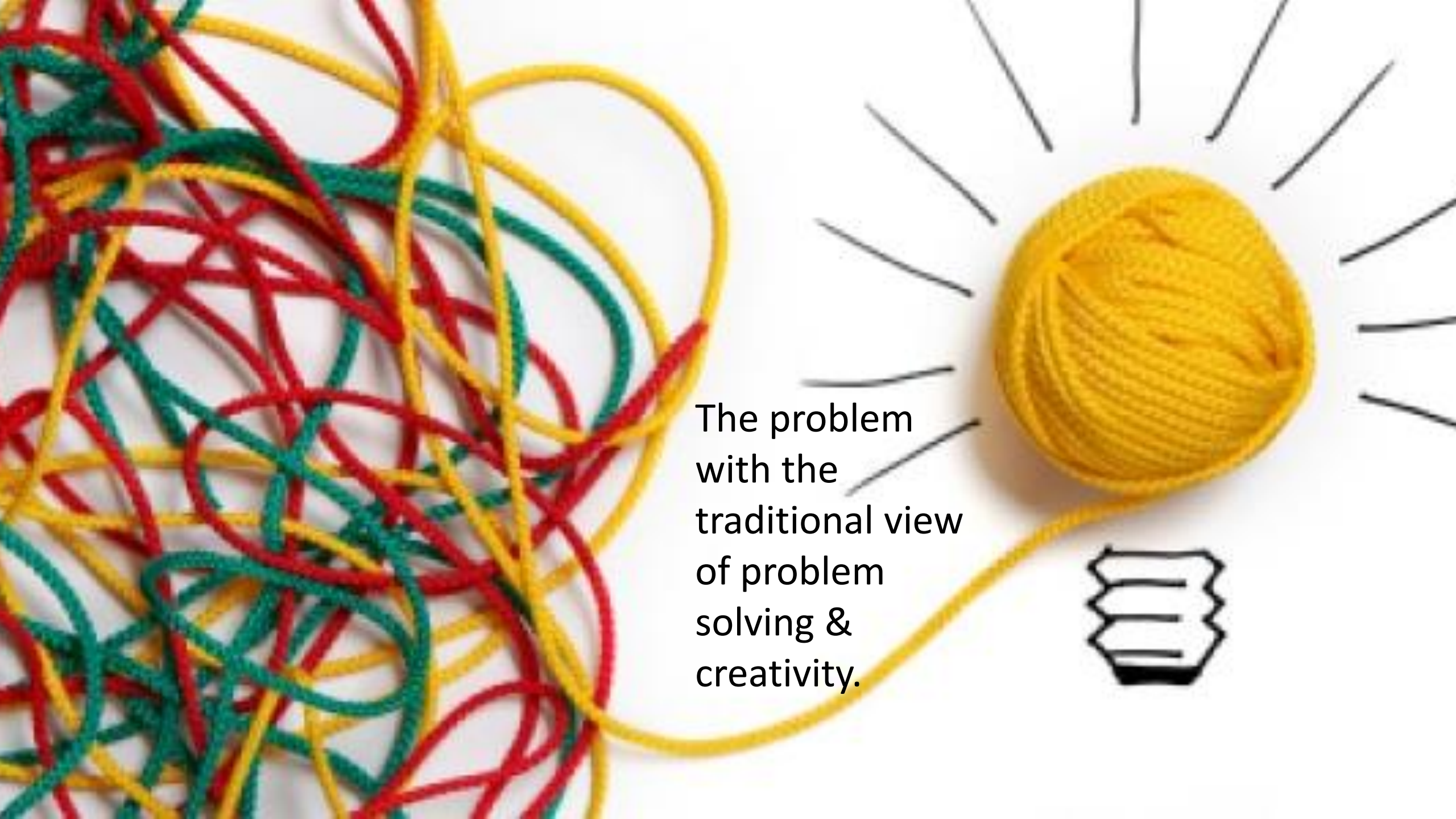
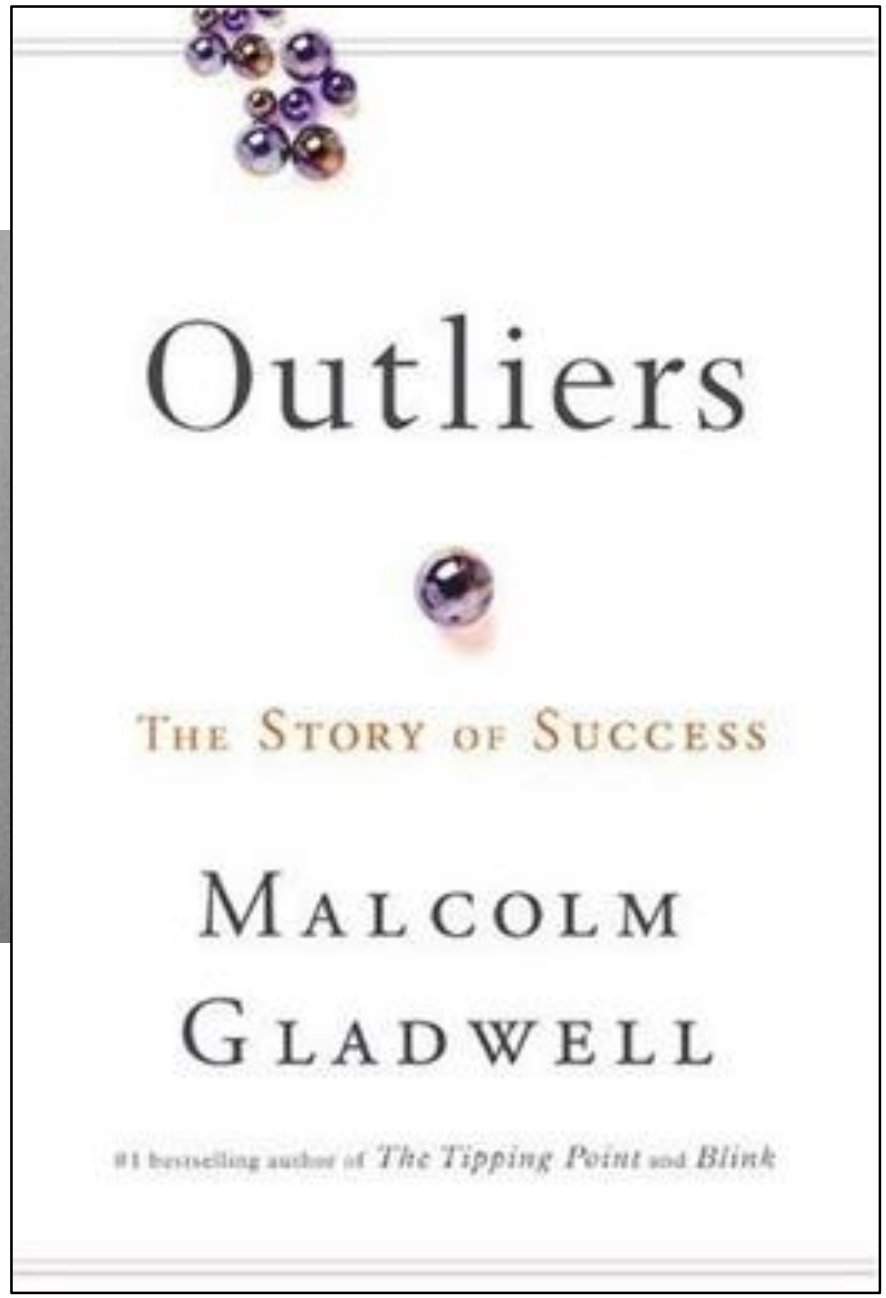
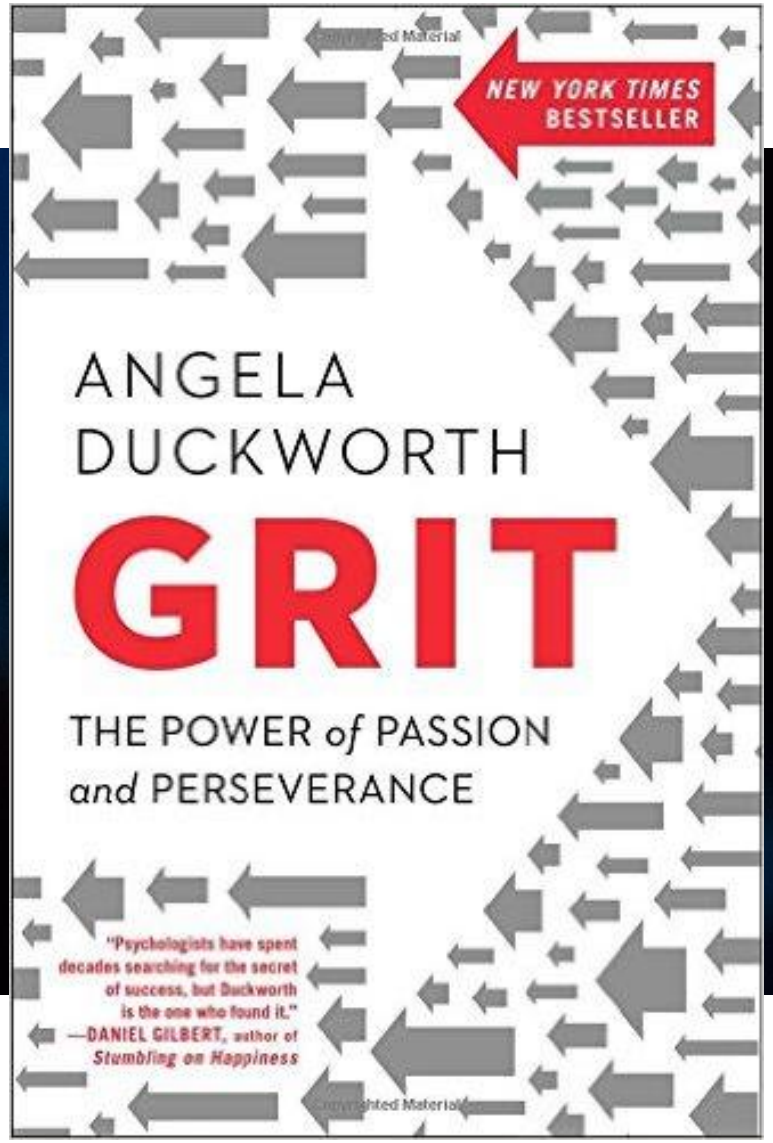
Steven Johnson

Creativity & Problem Solving

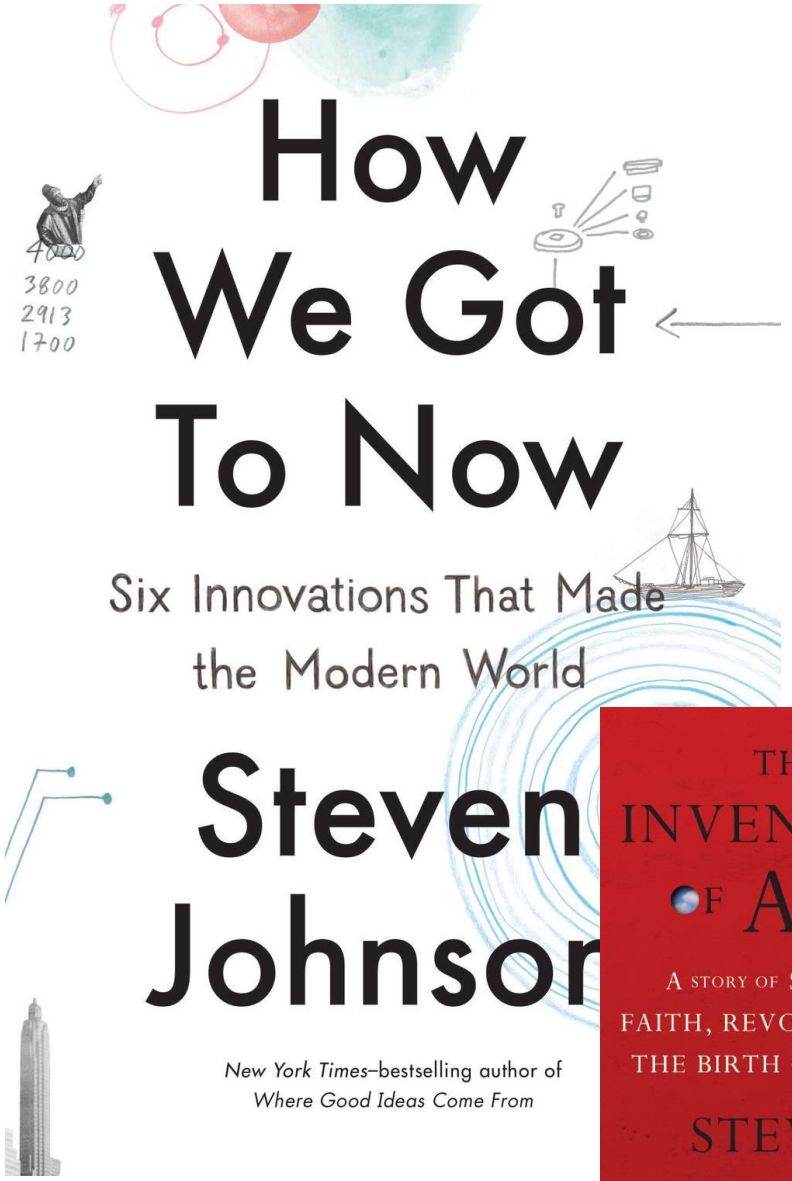


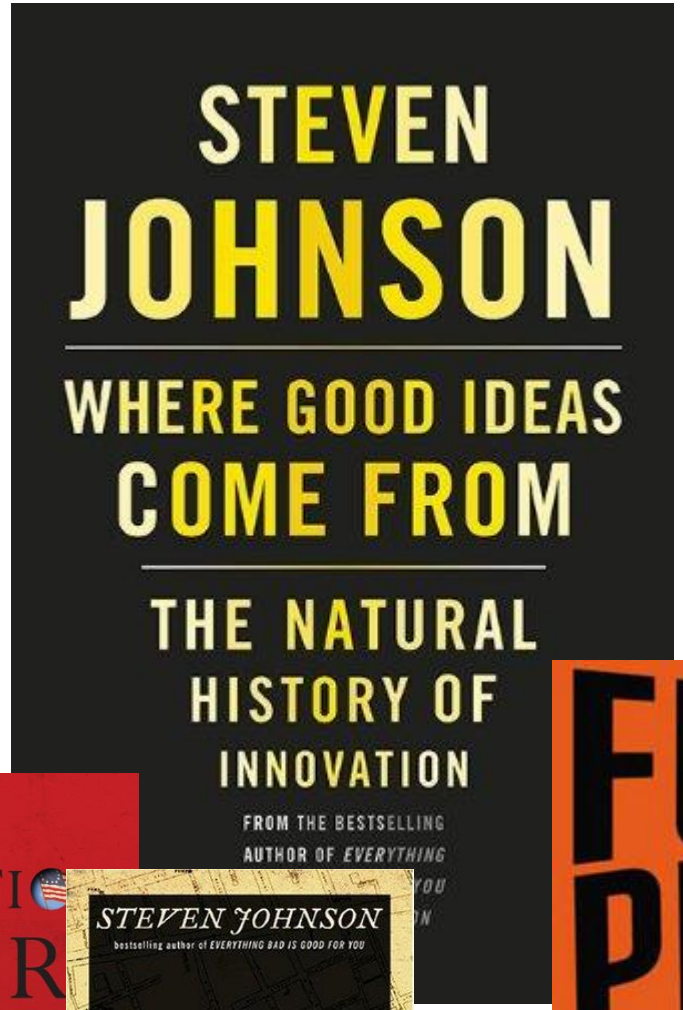
The problem with the traditional view of problem solving & creativity.

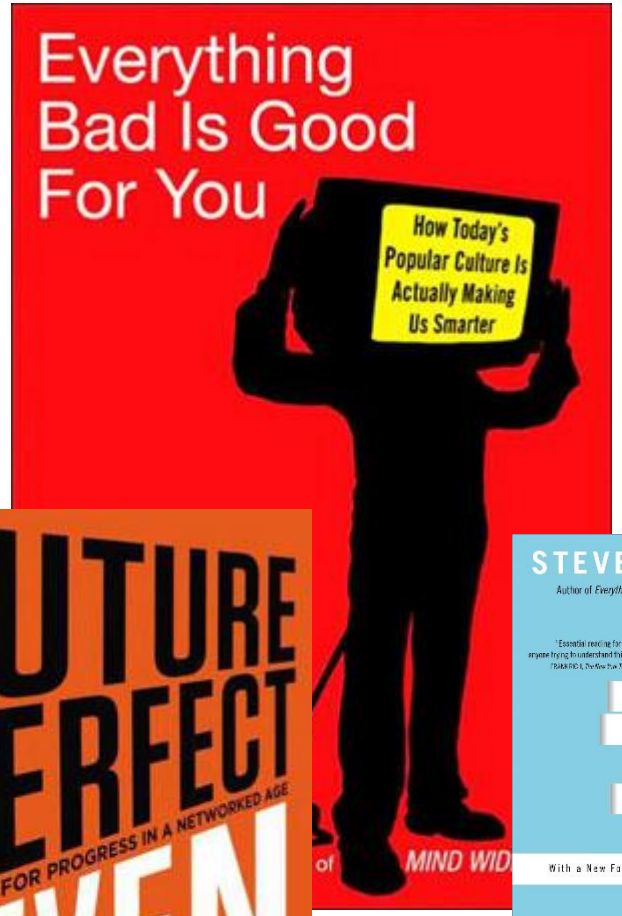

Outliers
The Story of Success
Malcolm Gladwell
#1 bestselling author of The Tipping Point and Blink

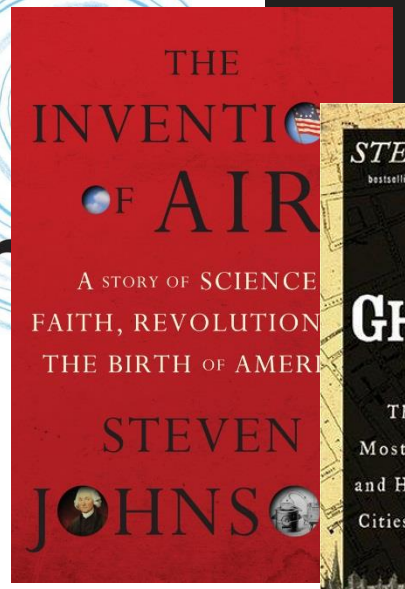

NEW YORK TIMES BESTSELLER
ANGELA DUCKWORTH
GRIT
THE POWER of PASSION and PERSEVERANCE
"Psychologists have spent decades searching for the secret of success, but Duckworth is the one who found it."
—DANIEL GILBERT, author of Stumbling on Happiness

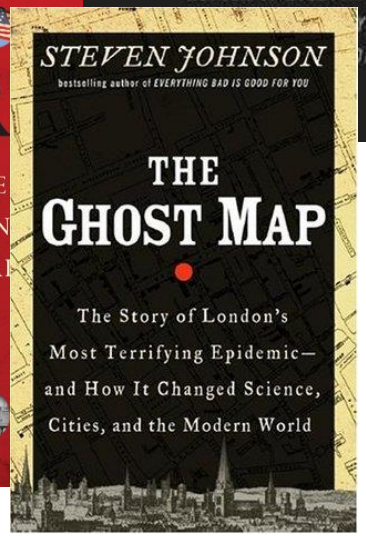
Steven Johnson

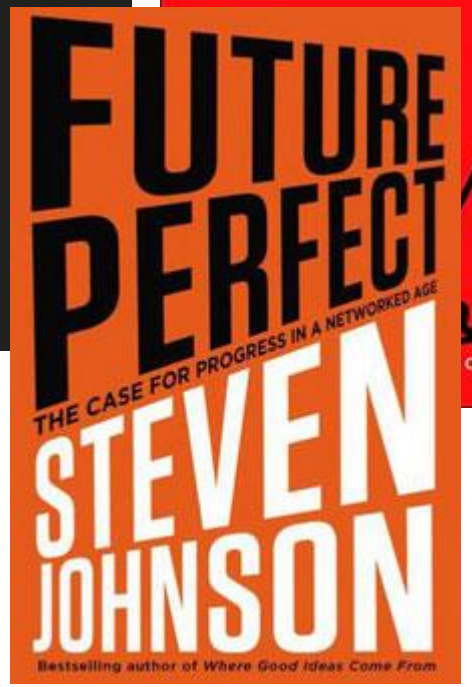

How We Got To Now
Six Innovations That Made the Modern World
Steven Johnson
New York Times–bestselling author of Where Good Ideas Come From

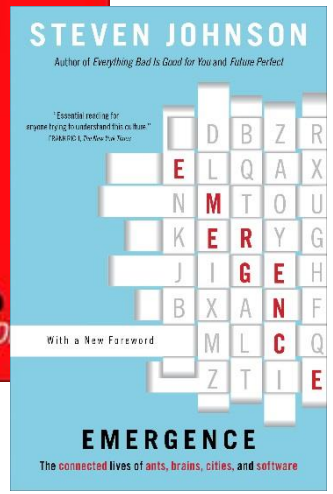

STEVEN JOHNSON
WHERE GOOD IDEAS COME FROM
THE NATURAL HISTORY OF INNOVATION
FROM THE BESTSELLING AUTHOR OF EVERYTHING


Everything Bad Is Good For You
How Today's Popular Culture Is Actually Making Us Smarter


THE INVENTION OF AIR
A STORY OF SCIENCE, FAITH, REVOLUTION, AND THE BIRTH OF AMERICA
STEVEN JOHNSON

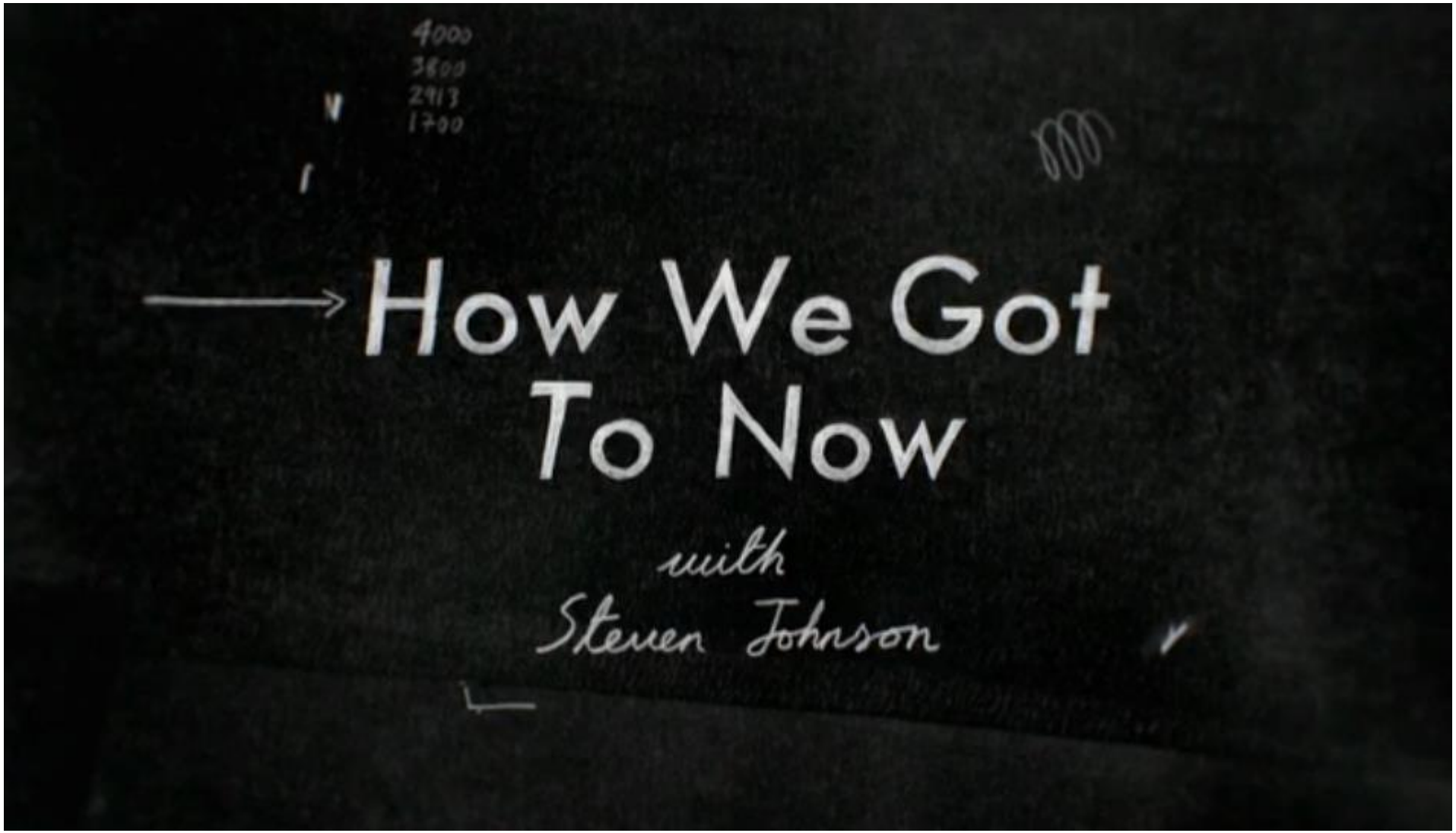

STEVEN JOHNSON
bestselling author of EVERYTHING BAD IS GOOD FOR YOU
THE GHOST MAP
The Story of London's Most Terrifying Epidemic—and How It Changed Science, Cities, and the Modern World


FUTURE PERFECT
THE CASE FOR PROGRESS IN A NETWORKED AGE
STEVEN JOHNSON
Bestselling author of Where Good Ideas Come From


STEVEN JOHNSON
Author of Everything Bad Is Good for You and Future Perfect
With a New Foreword
EMERGENCE
The connected lives of ants, brains, cities, and software

PBS

NETFLIX



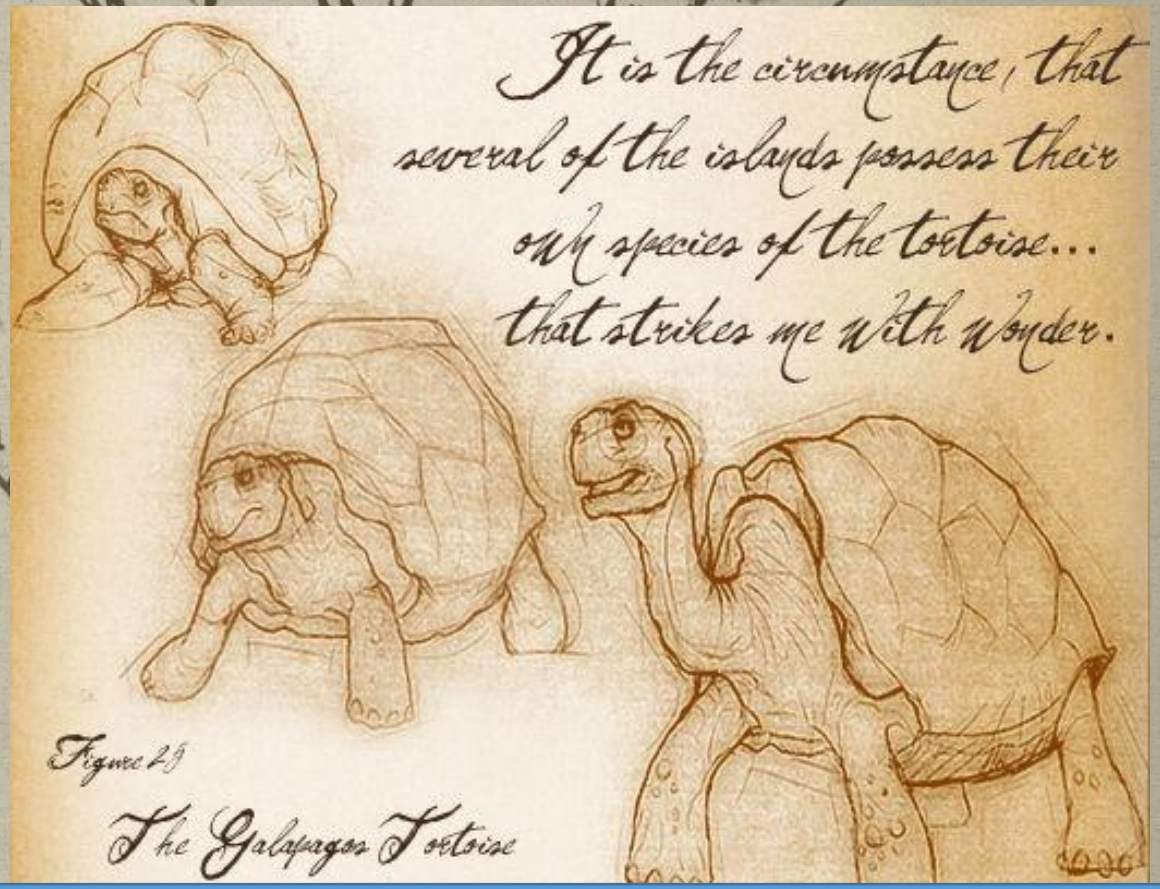
Eureka Moment

Lone genius, sudden flash of insight.

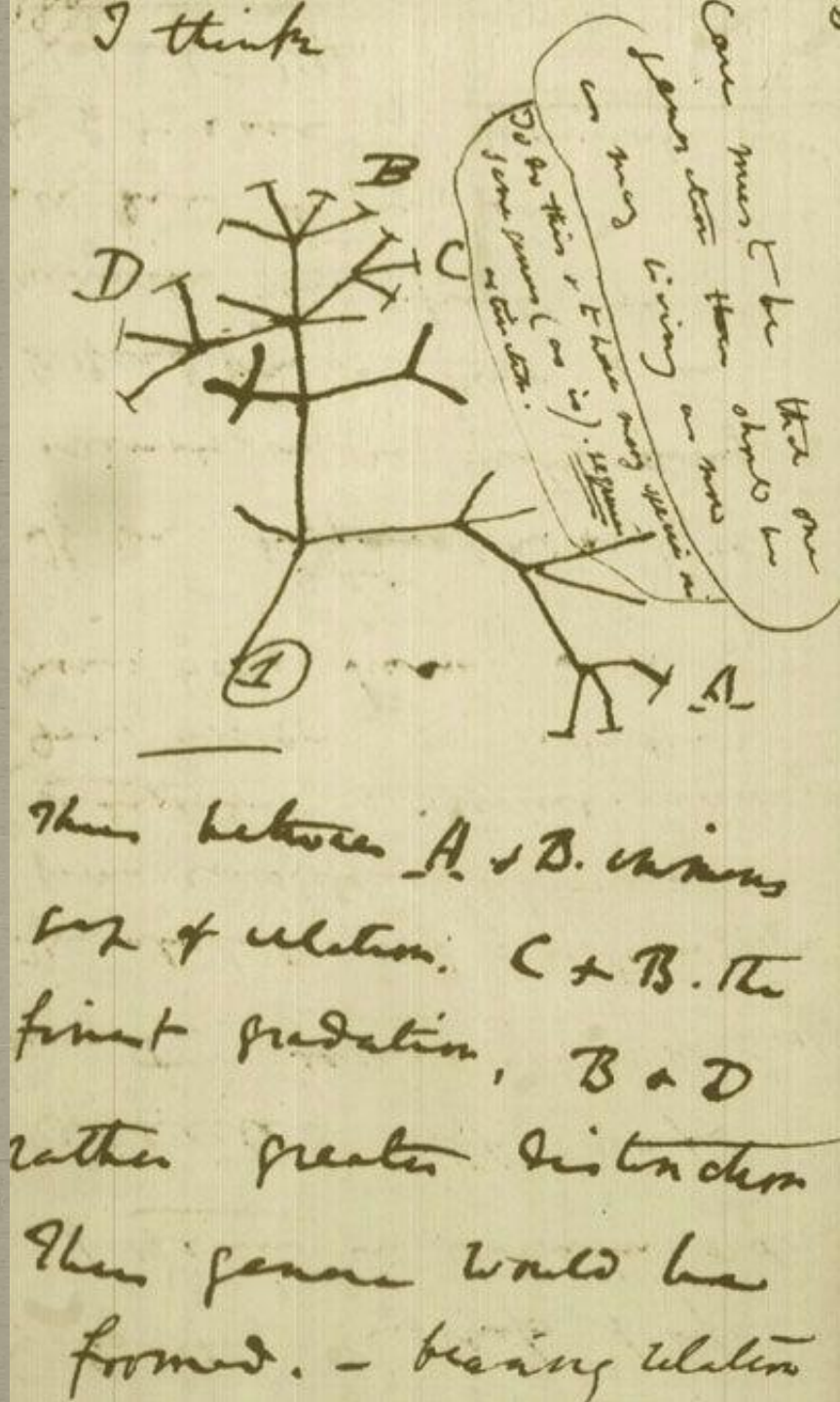

Not the whole story.
Eureka
Lone
insight.

Slow Hunch

If you actually go through the records of people who have a Eureka moment, they have ACTUALLY been working on the idea for YEARS.



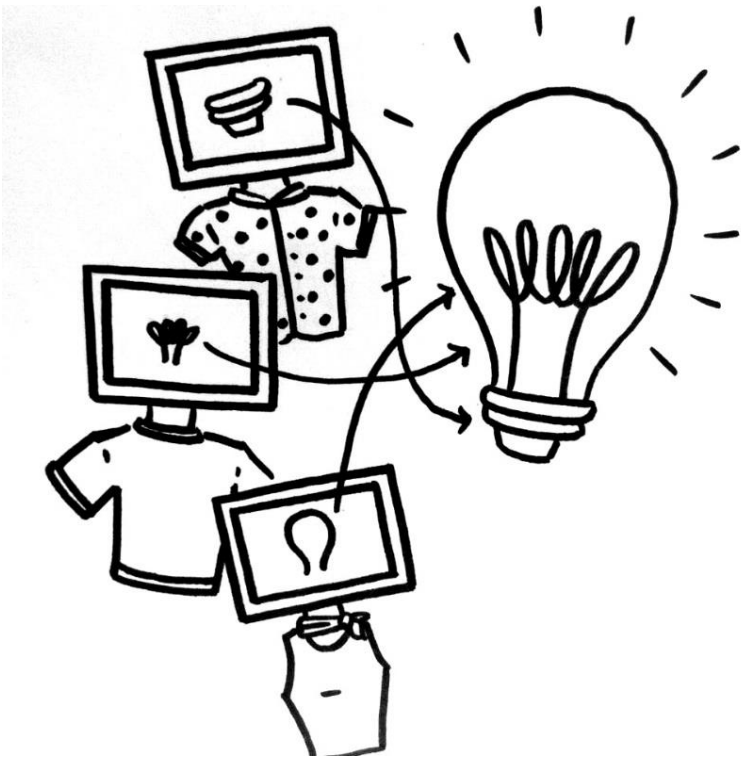
Johnson says that new ideas evolve over years. People think about them and experiment with pieces of them, playing around with the idea, until, finally, the idea is fully formed. This is the SLOW HUNCH.



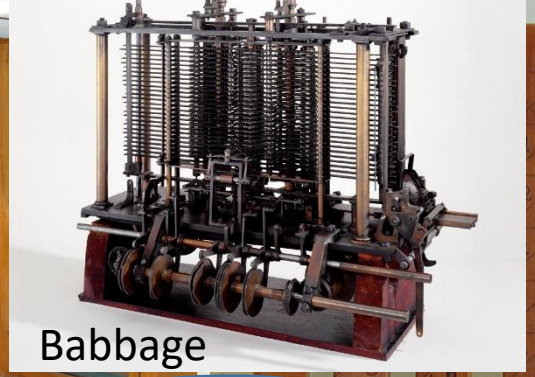
Ideas do not come from nowhere.

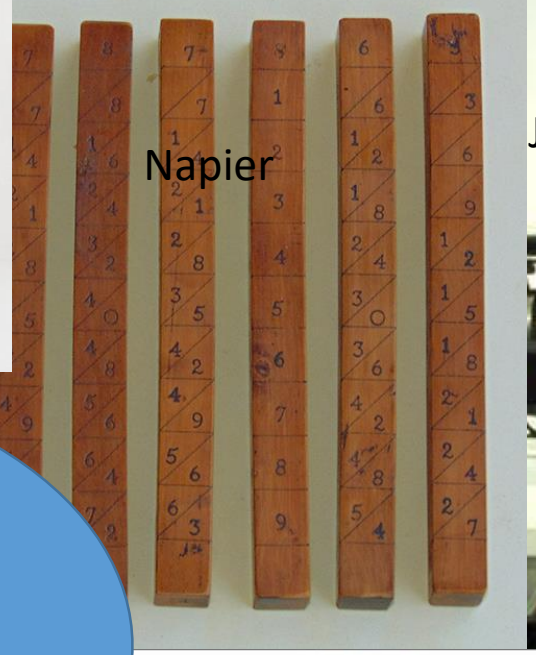
New ideas are often the re-combination of two old ideas.

New discoveries rely on other people and older ideas.

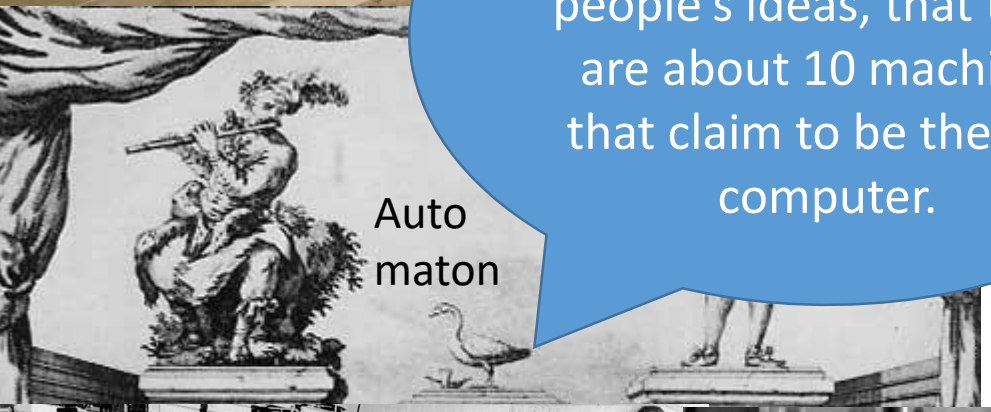


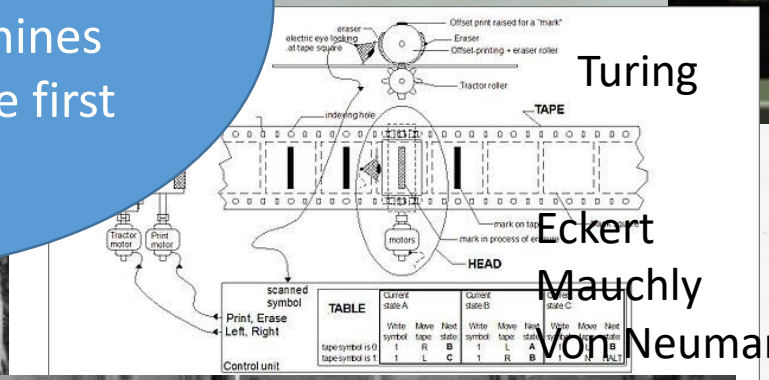
Liquid Networks

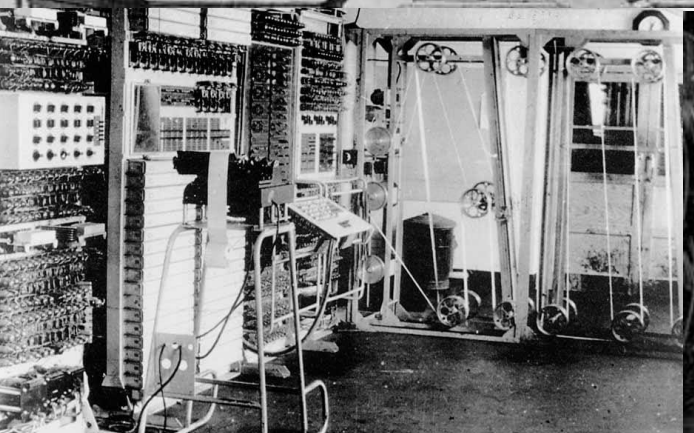


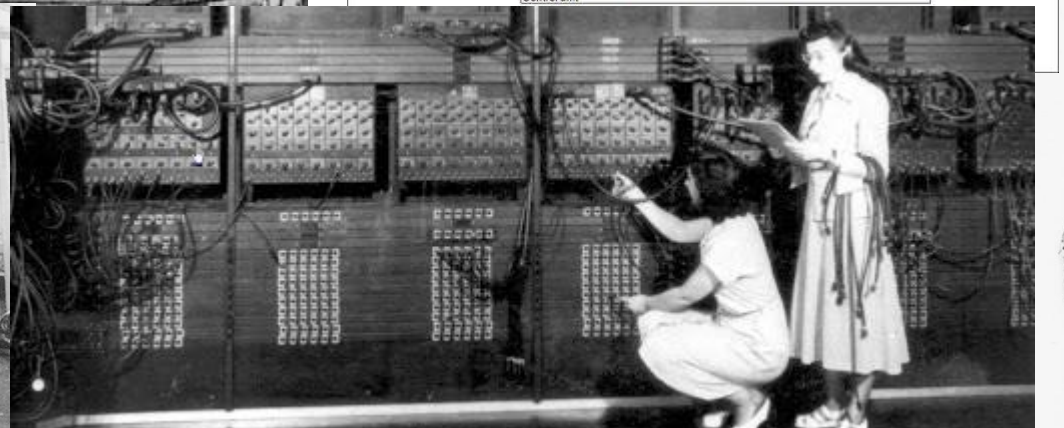


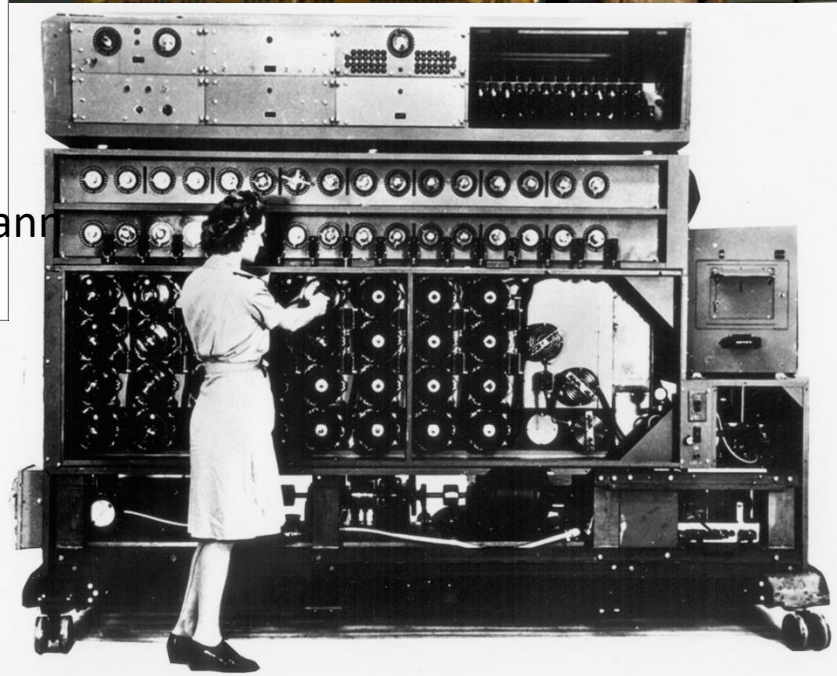
The idea of a "computer" is a network of SO MANY people's ideas, that there are about 10 machines that claim to be the first computer.

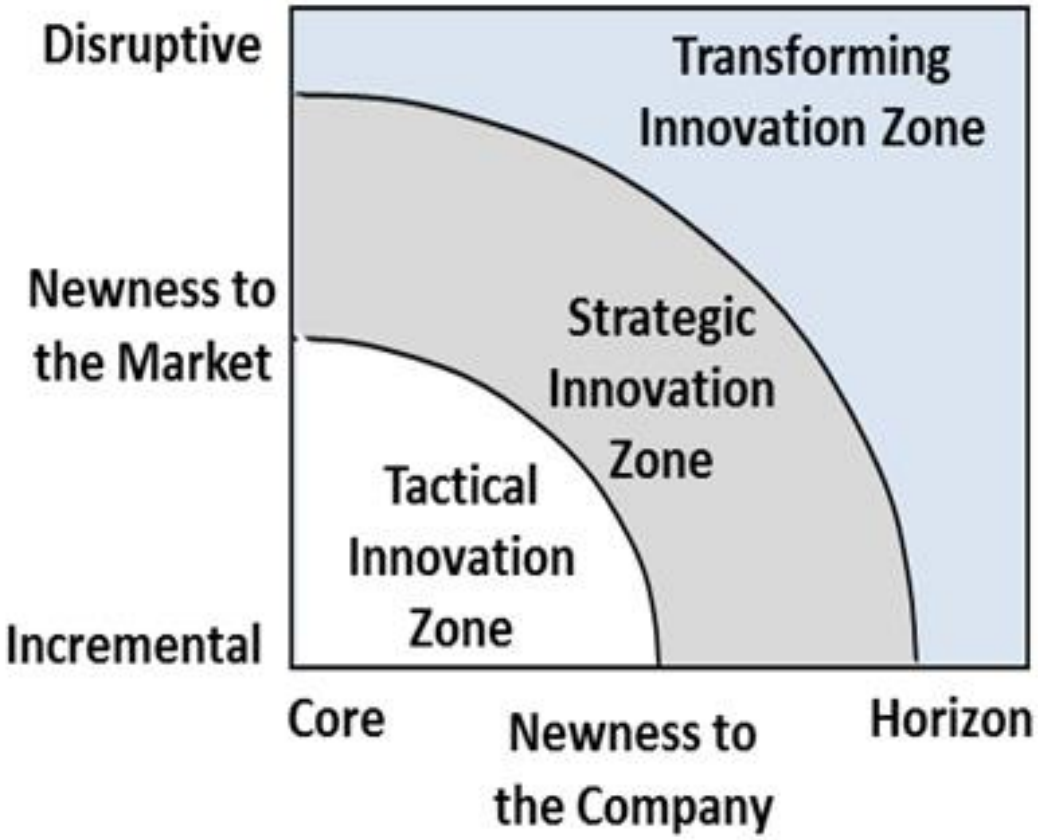












From our current level of understanding, only certain discoveries are probable.

Those discoveries happen in the adjacent possible – next to our current understanding.

Adjacent Possible

The Adjacent Possible

New discoveries happen in the range of the “adjacent possible”.

We don’t discover futuristic things that won’t be useful until far in the future very often.

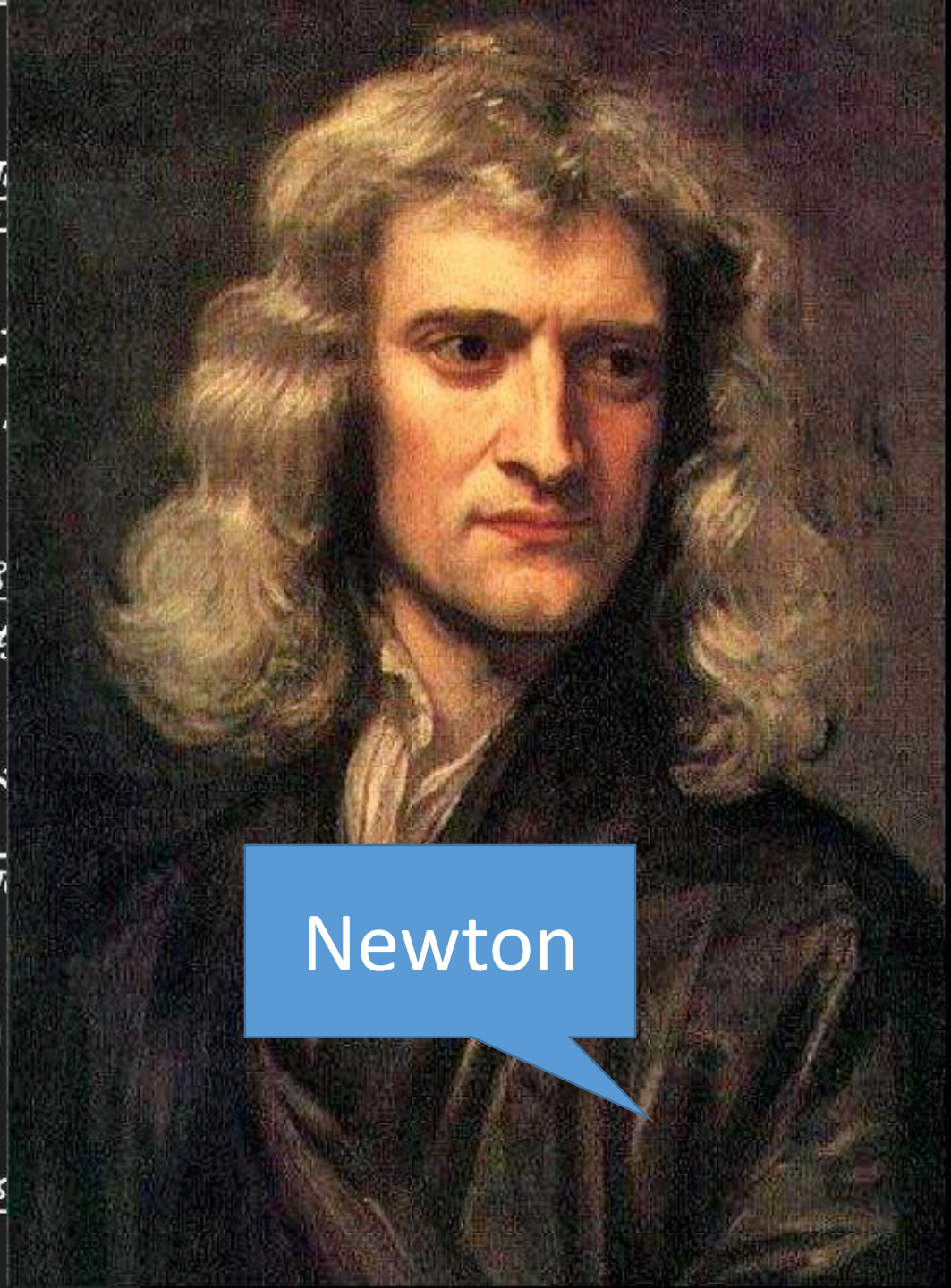
Instead, new ideas are just next to our current ideas.

Leibniz

Who discovered calculus?

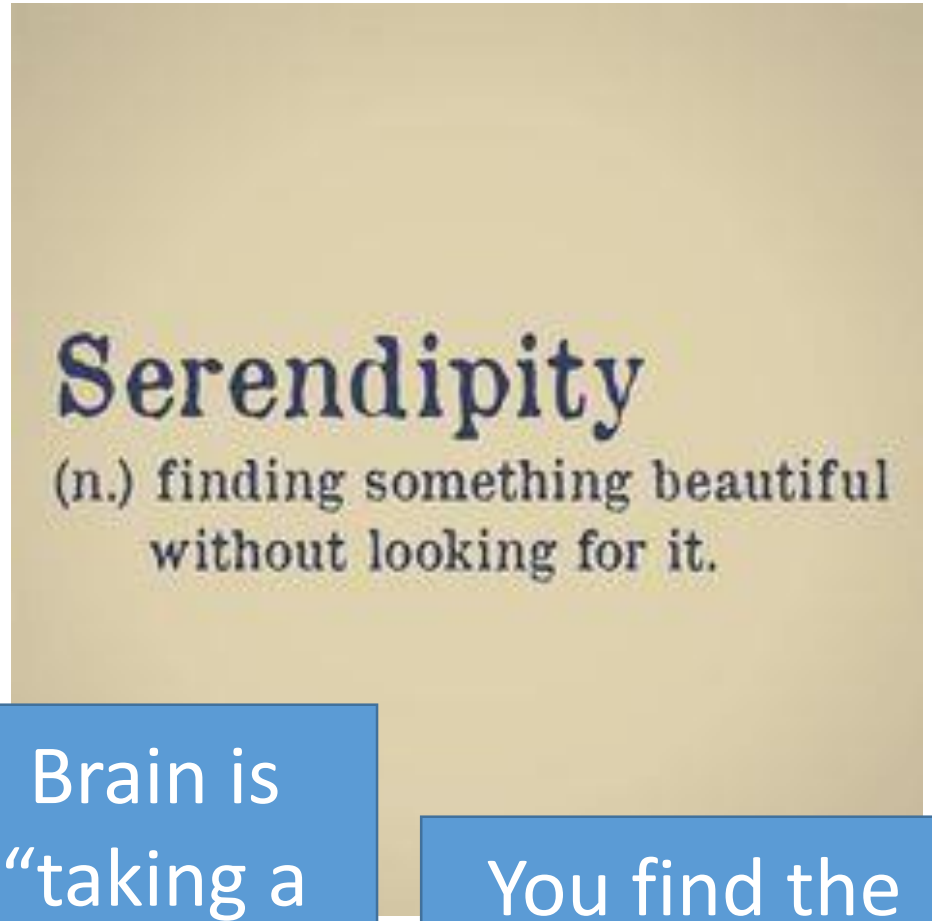
Because the mathematical ideas were ready, they just needed to be put together to found calculus.

Two brilliant mathematicians did this at more or less the same time – independently.



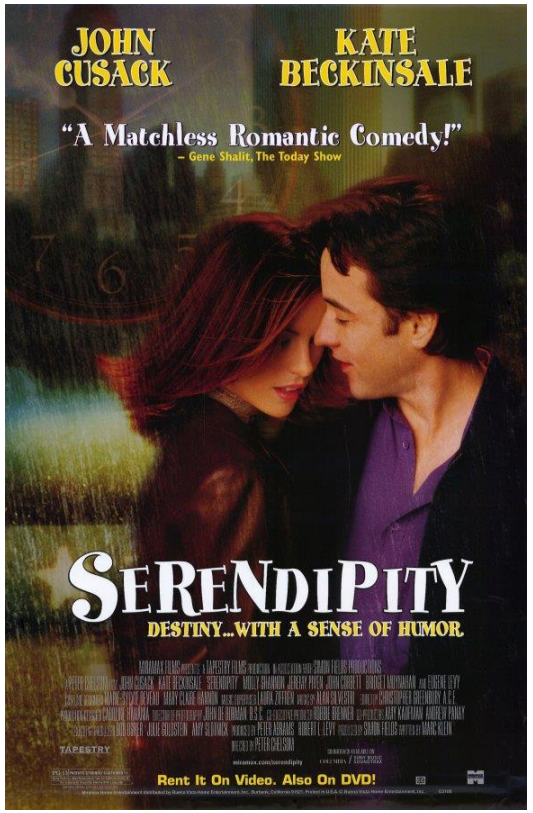
Newton

Serendipity

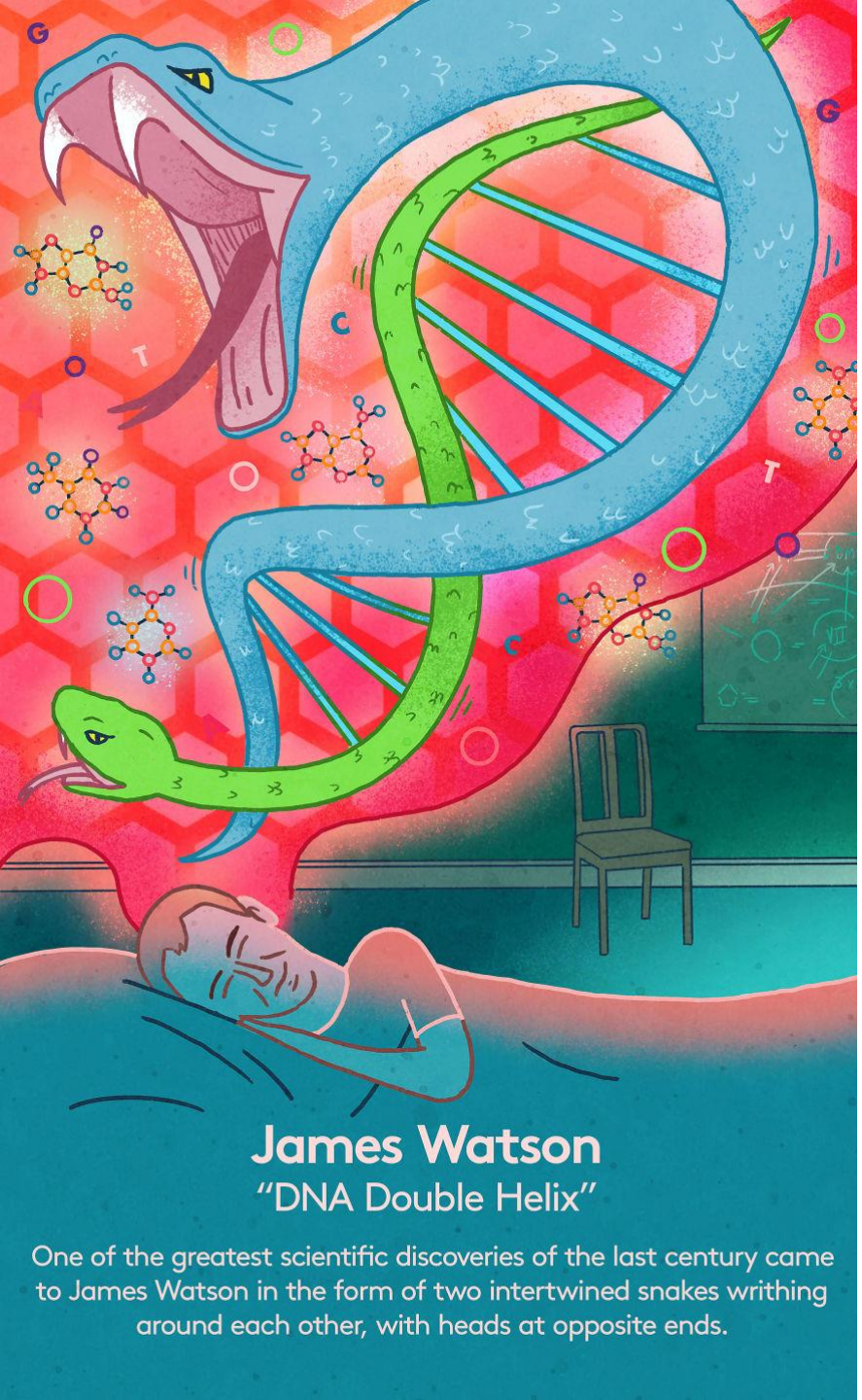


Brain is "taking a break"

You find the idea you were looking for



You are doing something completely unrelated and your slow hunch comes together!

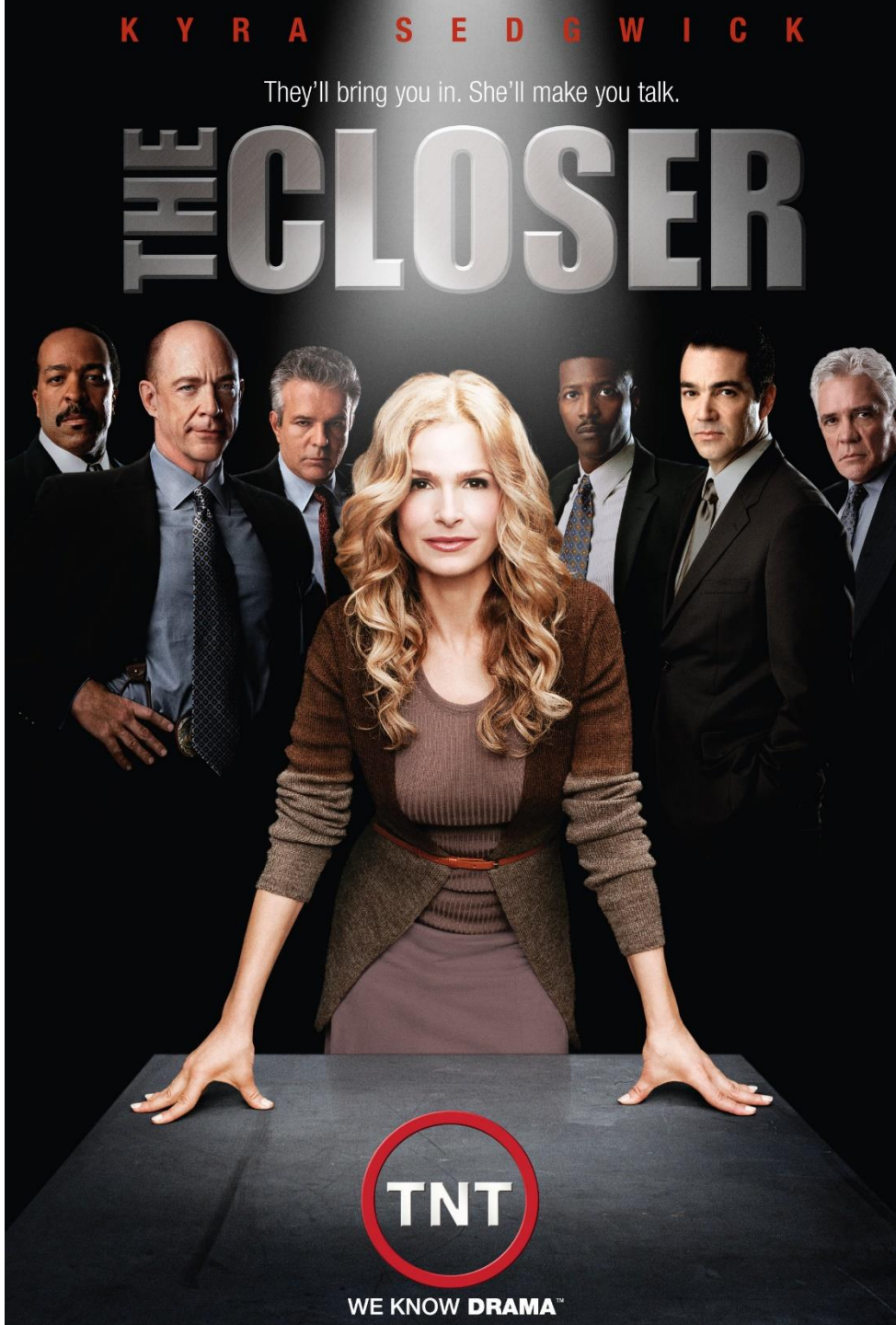


Working on a tough problem….

Rolling it around in your mind…

You have to take a break…

Then – you see the solution to your problem!



You have a theory.

You are working to prove it.

But then....

This really strange error occurs....

And you have to figure it out...

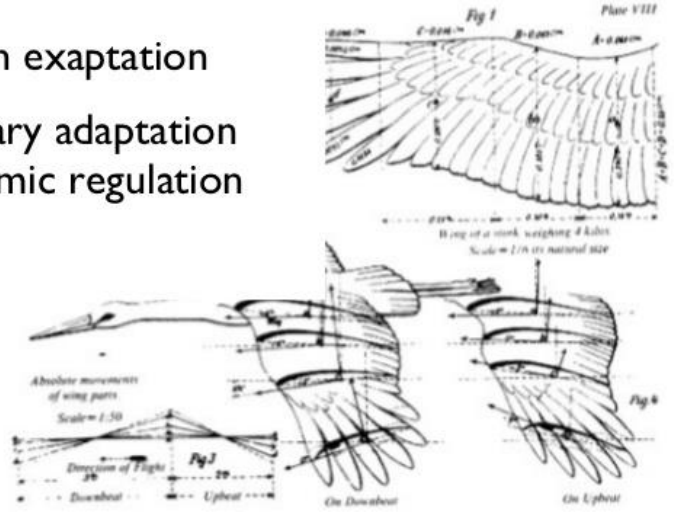
When you do that, you discover something new.

Exaptation

Taking an idea from another discipline and applying them to a new one.

Exaptation

- Flying is an exaptation
- A secondary adaptation from thermic regulation evolution



Promote "exaptation"

"Exaptation: A character previously shaped by natural selection for a particular function, is coopted for a new use"

Gould & Vrba 1982

John Von Neumann

Game theory

Manhattan Project

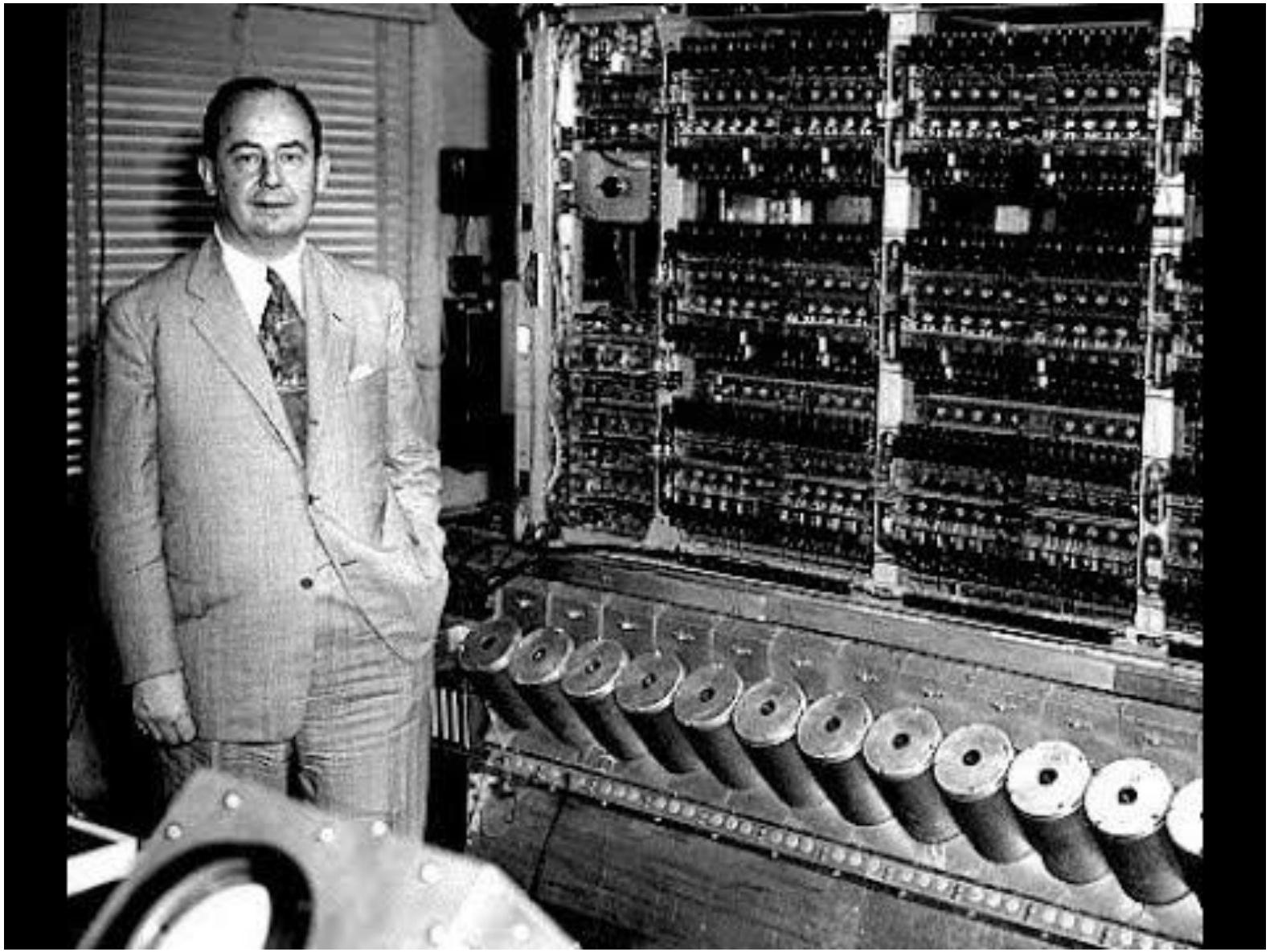
Foundations of Mathematics

Digital Computer

ENIAC

First Climate Modelling Software

Quantum Mechanics



To gain a measure of von Neumann's achievements, consider that had he lived a normal span of years, he would certainly have been a recipient of a Nobel Prize in economics. And if there were Nobel Prizes in computer science and mathematics, he would have been honored by these, too. So the writer of these letters should be thought of as a triple Nobel laureate or, possibly, a 4-fold winner, for his work in physics, in particular, quantum mechanics.

"Keeping up with him was ... impossible. The feeling was you were on a tricycle chasing a racing car."

Von Neumann's method?

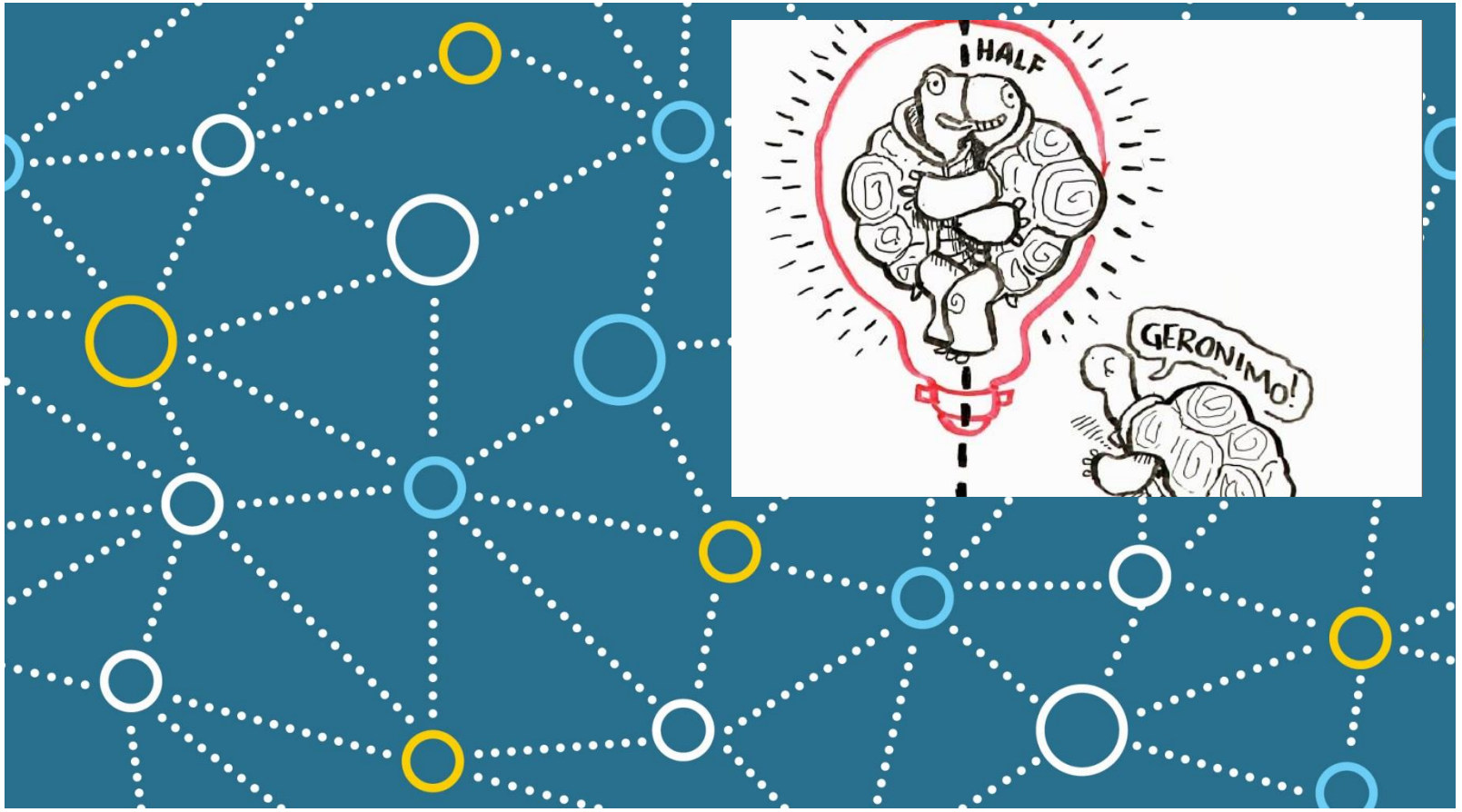
1. He memorized as many formulas and definitions as he could.

2. He looked for other places to apply them – in other disciplines.

Exaptation

The other half of your half-developed idea is probably in someone else's head.

Platforms



We need to have platforms and places to collaborate, so that we can share our ideas.

Google search term: RSA Animate Steven Johnson

https://www.youtube.com/watch?v=NugRZGDbPFU

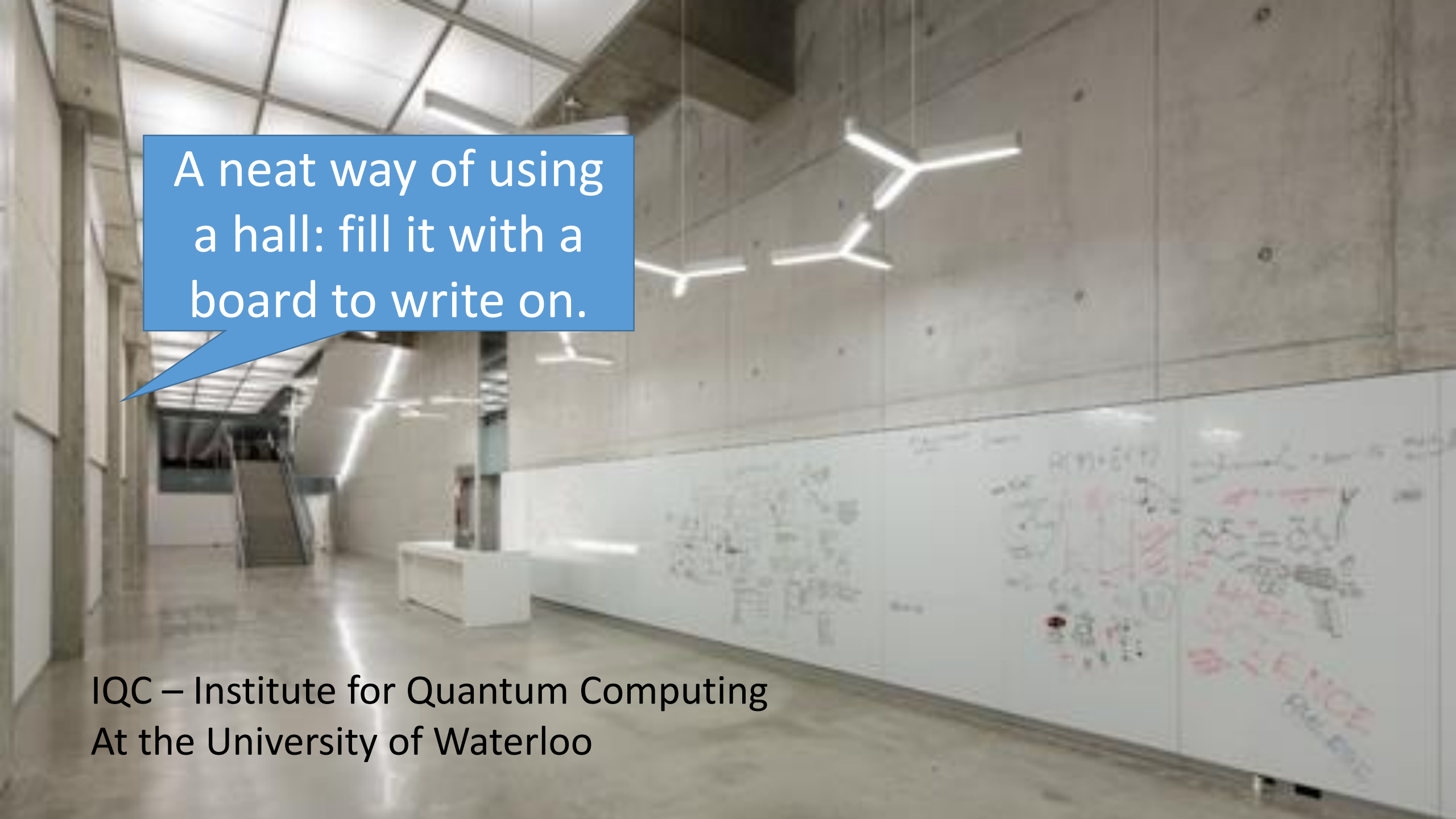
Many tech companies are well known for instituting Johnson's ideas in their workplace to foster creativity

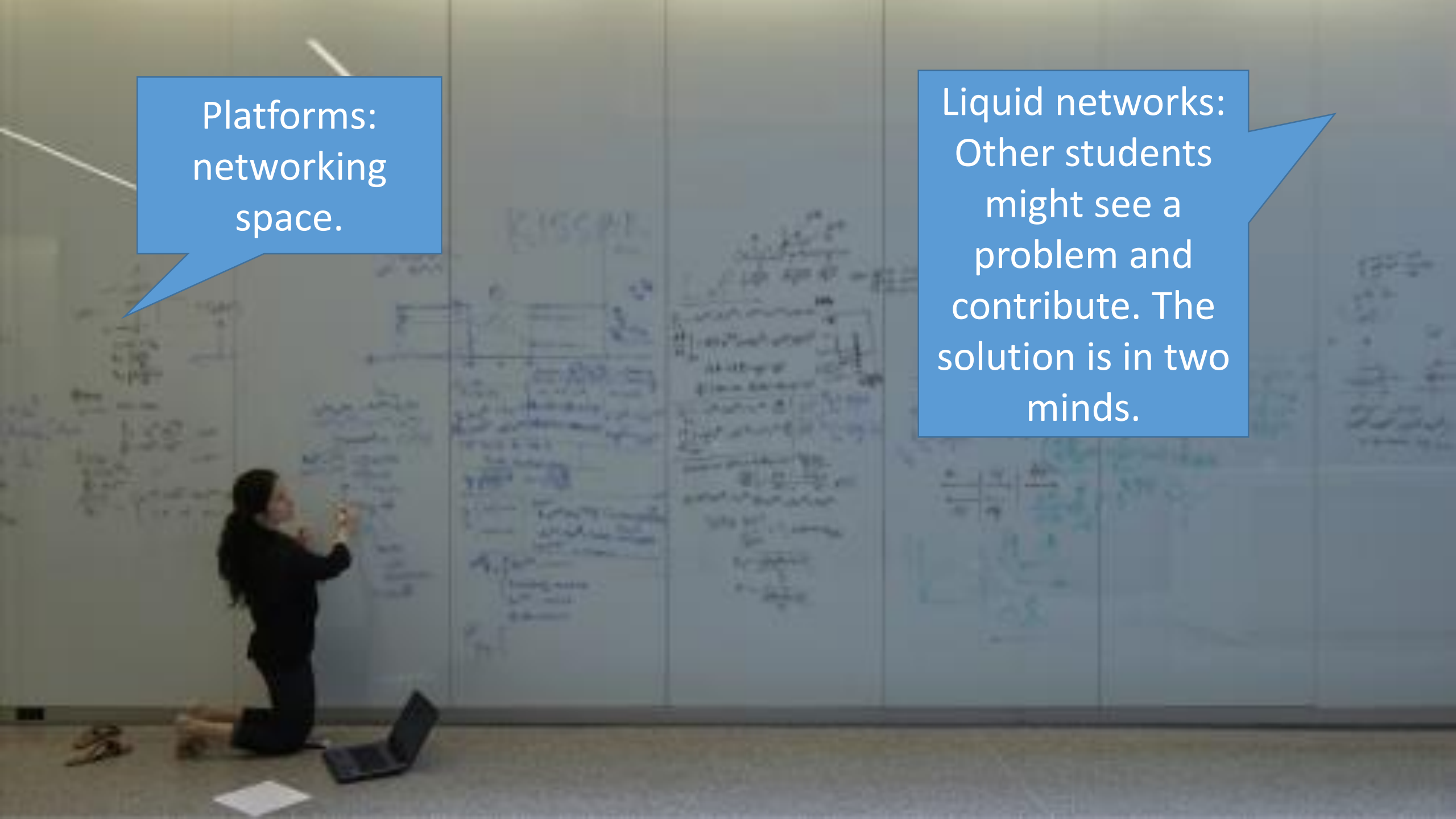
Liquid Platforms: Many spaces are provided for people to share ideas and collaborate.

Serendipity: When coders are stuck, they relax and do other things. With their mind working on other things, the breakthrough might occur.

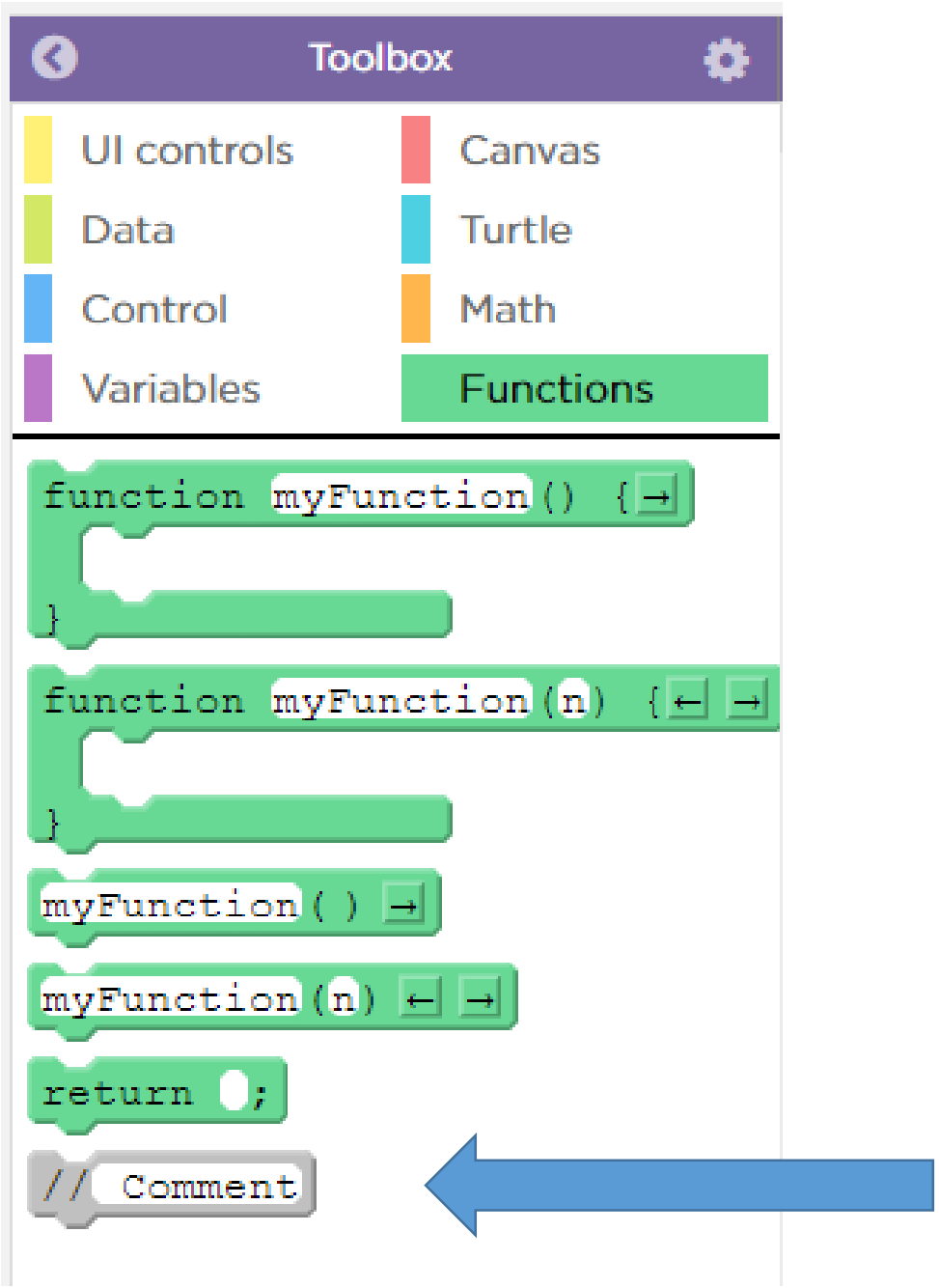
Serendipity: Silly spaces and crazy off topic things. Allow the brain to take alternative approaches to the problem at hand.

Exaptation: Different people from different disciplines are hired to work for the company – to bring in new ideas from the outside.


A neat way of using a hall: fill it with a board to write on.
IQC – Institute for Quantum Computing
At the University of Waterloo


Platforms: networking space.
Liquid networks: Other students might see a problem and contribute. The solution is in two minds.

Commenting and Indenting



A comment is code that doesn't run.

This seems like it should be useless, but it really isn't.


```
//Name: Ida Knowe
//Date: Sept 30, 2020
//Purpose: Escape Room Project
```

- Title comments – Name, Date and Purpose
- Appear at the top of the code
- Are used to “sign” your work.

```
//Navigation Buttons ------------------
```

- Subtitles in the code
- We can use ------ or other symbols to separate and organize our code.

```
//REMEMBER: Fix the timeout before handing in
```

- Notes to yourself
- Sometimes it is handy to leave yourself a note

```
/* This part isn't working right now
onEvent("id", "click", function( ) {
 setText("id", "text");
 playSound("sound://default.mp3", false);
});
*/
```

- Commenting out code
- Use /* and */ to temporarily take out code
- Lets you save code that isn’t running, but still run the code to test other things.

```
// I am not sure if we need this, but too scared to delete.

// Magic. Do not touch.

// Dear maintainer:
//
// Once you are done trying to 'optimize' this routine,
// and have realized what a terrible mistake that was,
// please increment the following counter as a warning
// to the next guy:
//
// total_hours_wasted_here = 42

// TODO make this work
```

Some silly comments put in code by programmers

```
// Dear future me. Please forgive me.
// I can't even begin to express how sorry I am.


// it was hard to write
// so it should be hard to read


// Houston, we have a problem


// NO COMMENT


// If you're reading this, that means you have been
// put in charge of my previous project.
// I am so, so sorry for you.
```

More silly comments

Indenting your code is like sentences and paragraphs in English.

It makes your code easier to read and allows others to understand it.

It also can make it easier for you to see where a section of the code starts and ends.