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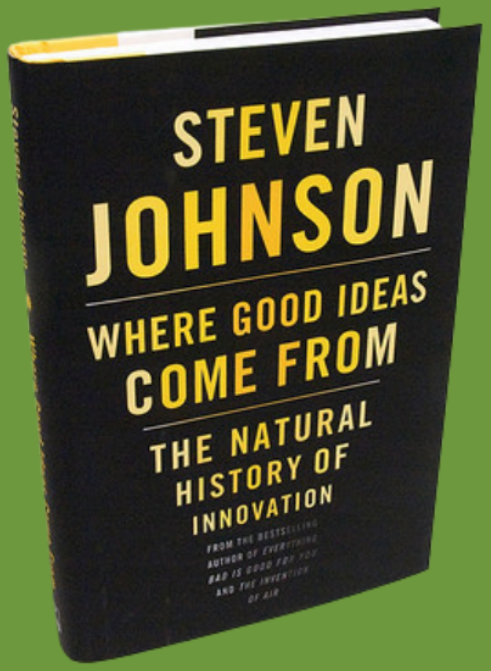
WHERE GOOD IDEAS COME FROM:
THE NATURAL HISTORY OF INNOVATION

BY STEVEN JOHNSON



Matthew Reece gave me this book. Another book on the mind, on ideas, in the wake of my readings of Taleb, Kahneman, Lehrer. Johnson describes how patterns of creativity occur, identifies seven patterns of innovation. He does so in the American vein, starting each chapter with a story or a telling moment. The style is lively, informative, alert.

In the **introduction**, we see Darwin in 1837, on the island of Keeling off the Sumatra coast, musing about the richness of biological life on the coral reef, despite a poor nutritional environment (Darwin's paradox). His intuition that is linked to the slow emergence of a fertile platform over time will later be corroborated.

The next figure we discover is a Swiss rebel who emigrates to California in the 1910s. Klaiber invents an interesting equation, showing that metabolism scales to mass to the negative quarter power (**page 9**). To be more concrete: the number of heartbeats per lifetime tends to be stable from species to species, but bigger animals take longer to use their quota (reminds me of the film "Les barons" where young Brussels Beurs take it easy, on the ground that each step they do is one more towards their grave!). A cow is 1000 times heavier than a woodchuck, it will live 5.5 times longer and its heart-rate is 5.5 times slower! (Square root of 1000 = 31, square root of 31 is around 5.5!) Later, a guy called West applied this law to human-built cities and found that Klaiber's law governs the energy and life of a city. But in terms of creativity and innovation, there is a positive quarter power law: a city 10 times bigger than another is 17 times more innovative.

Finally, Johnson explains the 10/10 rule: despite of technological acceleration, there is normally a period of 10 years required to move from the fringes to the mainstream, to build a new platform, and then it takes another 10 years to find a mass audience. But here again, there are exceptions: the creators of YouTube (Hurley, Chen, Karim) could compress this into 1/1 because they built on what existed, i.e. a platform to exchange videos!

The seven principles

1) T**he adjacent possible:** in a given situation, only certain changes or innovations are possible. The boundaries of the possible are however extensible and are constantly expanded. If you keep up opening doors to adjacent rooms, you will end up building a palace. The trick is to explore the edges

of possibility that surround us. YouTube invented earlier would have taken much longer, and maybe would have been a big flop. Tarnier could invent the incubator in the 1870s because he came upon an incubator for chickens in the zoo!

2) Liquid networks: a good idea is a network. Why is carbon such an essential part of organic life? because it has 4 valence electrons in the outermost shell of the atom that make it uniquely talented at forming connections with other atoms, primarily hydrogen, oxygen, sulphur, phosphorus, nitrogen and other carbon atoms. A second key element is a randomised environment where collisions between all elements in the system are encouraged. This explains the surge of innovation in Renaissance Italy where networks, connections and cities exploded into a myriad of ideas and initiatives breaking up the old static order.

3) Theslow hunch: intuitions that ripen over time are often more valuable than Eureka moments. But hunches have to be connected; in pre 9/11, various FBI agents had, separately, hunches about Arabs going to pilot classes, or strange behaviour, but no one connected the dots and drew the right conclusions. This is why Johnson advocates writing things down, keeping a commonplace book. Re-reading it, leafing through it, you will establish links, connect dots. The inventor of the WWW, Tim Berners-Lee, started out by simply wanting to keep track of data in his own organisation, the CERN, but then he saw links to other inventions and ideas and developed a much more ambitious project. That is also why Google has introduced the 20%-time rule, obliging all its engineers to spend 20% of their time on their own pet projects.

4) Serendipity or the power of accidental connection: the hunch requires an environment where surprising new connections can occur, serendipitous collisions of creative insights (the term "serendipity" was used in a letter by Walpole in 1754 describing the Persian story of the three princes of Serendip who accidentally stumbled on innovations and inventions). Again a good reason to keep quotes and ideas without ordering them too much; he uses a programme called DEVON think for this (I use "reservoir" notes to do something like that). This requires open networks; the system of protection of intellectual property can have a regressive effect here.

5) Error: many inventions/discoveries are due to simple errors, be it the invention of the triode, of penicillin or the cardiac pacemaker; remember also Lehrer's example of cosmic radiation.

6) Exaptation: a term coined by Stephen Jay Gould and Elisabeth Vrba in 1971 and pointing to an idea or contraption developed for one purpose being used for an altogether different one. Such things happen more easily in a liquid network environment where many ideas circulate and can collide (coffeehouse model on creativity).

7) Platforms: here Johnson comes back to the coral reefs and the Scleractinia that help build them. "*The platform builders and ecosystem engineers do not just open a door in the adjacent possible. they build an entire new floor.*" He mentions the story of two young Americans who listen to the acoustic signals emitted by the Soviet Sputnik launched in 1957. They discover that they can use the signal to track where the satellite is. Later this technique will be used in reverse order, i.e. satellites used to track objects on earth, and it is the birth of the GPS. Or take again Tim Berners-Lee: he used existing platforms to go further, the open protocols of the Internet platform. All he had to do was build a standard framework for describing hypertext pages (HTML) and sharing them via existing Internet channels, HTTP.

In the **conclusion**, Johnson sets up four quadrants:

1) MARKET INDIVIDUAL	2) MARKET NETWORK
3) NON-MARKET INDIVIDUAL	4) NON-MARKET NETWORK

Between 1400-1600, most innovations occurred in the third quadrant. From 1600-1800, most occurred in the third and fourth quadrant. Between 1800 and now, we have lots of examples in all quadrants, but a real explosion in 4. The least populated quadrant is 1; the proprietary breakthrough in a closed lab is the exception rather than the rule. That is why the protection of intellectual property creates insufficient markets (**see quote by Jefferson on page 241!**).

Last recommendation: "*Go for a walk, cultivate hunches, write everything down, but keep your folders messy, embrace serendipity, make generative mistakes, take on multiple hobbies, frequent coffeehouses and other liquid networks, follow the links, let others build on your ideas, borrow, reinvent, build a tangled bank.*"