DAY 11: PROGRESS CHECK_READING 7-8

READING 7: You are going to read an article about using nature as inspiration for inventions. Seven paragraphs have been removed from the article. Choose from the paragraphs A – H the one which fits each gap (37 – 43). There is one extra paragraph which you do not need to use.

Does copying nature lead to success at inventing?

There's no magic formula, but there are ways to improve your creativity. One method is to look at nature. Some call this activity bionics, others biomimetics. Whatever you call it, it is big business: in recent years we have seen the rise of university courses, institutes and learned journals on the subject. Perhaps 'bio-inspired design' is a better term.

(37) .....

Several hundred years passed before we realized why. The bird's wing performs two separate tasks, both of which are essential. Through its shape, it provides lift when air passes over it, and through its movement, it provides power. The crucial step to making aircraft was to separate these two functions, leaving the wing to do the lifting, but transferring the power function to an engine and propeller, something no bird ever possessed.

(38) .....

Take structural materials for example. Bone is an excellent material, providing support and strength. Currently we can't make materials that reproduce a bone's internal structure. But even if we could, we wouldn't be able to use it in engineering structures for many reasons.

(30) .....

But nature is happy to work with much higher rates: the chance of breaking a bone if you are a monkey in the wild is about 2% per bone per year. If engineers worked to that standard they would soon be looking for another job.

(40) .....

German engineer Claus Mattheck has a lifelong love affair with trees which has led to many innovations in engineering design. One of these considers the junction where the branch of a tree meets the trunk. Mattheck said that the curvature around this junction seemed to be very cleverly designed to minimize the concentration of stress that occurs when engineers try to design the same shape. He suggested that the tree was sensitive to stress and so, as it grew, would deliberately place material in such a way as to minimize stress.

(41) .....

But when you actually go and look at trees, it isn't clear whether Mattheck is right. Perhaps trees aren't actually doing what he thinks they are doing – though proving it would be quite difficult. But of course it doesn't matter if you remember that nature was only the starting point, not the objective of the exercise.

(42) .....

The report predicted that this fascinating result will be used by bioengineers to improve engineering design. Well, perhaps it will, but if so the inspiration will be the opposite of what it seems. It is well known that smaller animals can run faster when measured by body size – even the humble cockroach beats the cheetah on that measure.

LIVEWORKSHEETS

(43) .....

Nature can be a wonderful muse, an excellent starting point in the development of a new engineering device or material, but don't make the mistake of thinking that nature has already solved your problems for you.

A But a simple biomechanical model, applying the appropriate scaling laws, would sugges that all animals should be able to run at the same absolute speed, not the same relative speed. So the inspiration here will come from asking 'Why are the little guys so slow?'

B First, nature can live with failure, but we can't. When we design a component for a car or aircraft, we need to ensure that the probability of failure of that part per year is something like one in a million, because a vehicle has thousands of parts and is supposed to last for tens of years without catastrophic failure.

C This idea led to the development of a computer programme to simulate the way they grow, and the result was a fantastic reduction in stress concentration, allowing for more slender components. This is important, because shaving a few percent off the weight of a component in a car means lower materials costs, less fuel usage, less CO2 emissions and so on.

D The reason for this difference is that for nature, the failure of an individual is of no consequence. What matters is the survival of the species. Nature is wasteful of individual lives in a way which we risk-averse humans can't tolerate.

E This begs the question of whether we need to look to nature for inventions at all. Perhaps all that is really necessary is an active imagination; one that will create solutions to the 'problems' we perceive there to be.

F Another example is the recent news that scientists have discovered an animal that runs faster than any other – and it's a mite. The story – no doubt distorting the original science – was that this mite runs faster than a cheetah if you measure speed in terms ofhow many body lengths it covers per second.

G Here's why. If it hadn't been for birds, I doubt anyone would have even thought that it might be possible for something heavier than air to become airborne. With his flying machine, fifteenth-century inventor Leonardo da Vinci had a detailed design that looks, on paper, very impressive. But it doesn't work.

H There is an important lesson here. The first step when inventing is to imitate nature, andthe second is to abandon nature's ways. At some point you have to give up the love affair, dump nature and move on. The problem is that simply copying nature doesn't work.

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READING 8: You are going to read an article about self-help books. For questions 44 – 53, choose from the sections A – E. The sections may be chosen more than once.

In which section are the following mentioned by the author?

possible hypotheses about how a trend may have come about **44** .....

a contrast between two different schools of thought **45** .....

an attempt on the behalf of one author to back up ideas with evidence **46** .....

his scepticism about the wisdom of paying too much attention to 'experts' **47** .....

a conviction that the self-help genre is likely to remain popular **48** .....

a dawning realization that a book's intention was different from what he had first thought **49** .....

a concern about the future implications of reading self-help books **50** .....

a compulsion to try to find out more about who he is **51** .....

his initial observation that there was a movement towards a particular type of writing **52** .....

an apparent contradiction in advice that is given **53** .....

How self-help books have changed the way we think

By Kevin Eagan

A Over the last year, I've read a lot of popular non-fiction books, and I've noticed an interesting trend: many incorporate some level of self-help writing. It doesn't matter if the book is about neuroscience or running – they all seem to add in some type of life affirming advice, a classic 'how to', or an inspirational conclusion about the topic discussed. Ever since I read Barbara Ehrenreich's well researched *Bright-sided: How the relentless promotion of positive thinking has undermined America,* I have been ware of the self-help and positive thinking movement. Ehrenreich's book shows how the current movement comes from an American history split between two ways of going about things: one being a 'pull-up-your bootstraps' practicality and the other a naïve belief that if you think it up, you can do it. The most

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successful people, we believe, are able to do both of these things well, and they don't give up in the process.

B I am cynical about this way of thinking, especially after reading Ehrenreich's expose of the positive thinking movement. There are a lot of gurus out there trying to get me to spend money on things that may or may not help me perform better, get more productive or succeed in life. There is always a danger that I'll spend my time and money on these things and delay the work I could do on my own without experts guiding me. Yet I still find myself drawn to these popular non-fiction titles. I read them because they confirm things that I know about myself or help me see things I wouldn't have seen on my own. It's human nature to want someone in an authority position to confirm something we already know about ourselves. Sometimes, we need to feel like we've been given 'permission' to move forward.

C For example, I recently read Quiet: the power of introverts in a world that can't stop talking by Susan Cain. In this book, Cain dives into the cultural and scientific reasons why some people are introverted and concludes that we undervalue introverts by honouring extroverts, yet introverts are the ones changing the world. She begins her book with some convincing studies from sociology that show an 'introvert' is someone who gets energy from being alone, and in a society that honours outward appearances, many introverts get left behind. I'm an introvert, so I found myself agreeing with almost everything she said throughout the book. But as I read through each chapter, the underlying theme became 'yes, you, the introvert, can be successful too!' And that's when something started to occur to me: this reads a lot like a self-help book. It might have scientific studies to back up the ideas, but it ends by giving advice to introverts who feel left out in today's extroverted world.

D This move toward self-help could be an effect of internet culture. These books have taken off in recent years, and many writers have pioneered the author-as-marketing and self-help-guru approach to non-fiction. Or, it could be a result of our changing economy: if you're not portraying yourself as happy, successful, and productive, you won't get noticed (so we're told), and, as a result you'll be left behind. In order to be successful, we are guided towards giving off the appearance of success. For example, writers are told to have a 'platform' – a website, a social media strategy, a newsletter – in addition to churning out a series of bestselling novels. But in order to have the bestselling novel, it helps to write a lot, and that can only be done alone, away from the spotlight.

E This model of the non-fiction book that is really a self-help book seems like it's here to stay because it is incredibly successful. Even readers like me, who tend to be cynical and guarded, find solace and comfort in a book that uplifts and confirms. What I hope is that this approach to non-fiction won't lead to intellectual laziness, sloppy writing, or reductive thinking. I also hope it doesn't lead to a group of 20- and 30-somethings who are too busy reading books and articles about 'how-to-be-that' or 'the-science-of-this' that they stop creating things that lead to the next revolution. That type of future is scarier to me than a future filled with padded non-fiction bestsellers.

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