

TYRANTS

‘All for ourselves, and nothing for other people, seems, in every age of the world, to have been the vile maxim of the masters of mankind.’

An Inquiry into the Nature and Causes of the Wealth of Nations
by Adam Smith, 1776.

AND

HACKERS

‘Every system has two sets of rules: the rules as they are intended or commonly perceived, and the actual rules (“reality”). In most complex systems the gap between these two sets of rules is huge. Sometimes we catch a glimpse of the truth, and discover the actual rules of a system. Once the actual rules are known, it may be possible to perform “miracles” — things which violate the perceived rules. Hacking is most commonly associated with computers, and people who break into or otherwise subvert computer systems are often called hackers. . . . Hacking isn’t limited to computers though. Wherever there are systems, there is the potential for hacking, and there are systems everywhere.’

Blog entry by Paul Bucheit, 13 October 2009.

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Part I

Individuals: Me and You

Chapter 1

Body

“I am just going outside and may be some time.” It was March 1912 and with these words Lawrence Oates hobbled out of the tent to die. All four explorers knew that Oates was the slowest in their party. A few days earlier, he had tried to talk them into leaving him behind on the Antarctic ice sheet, but they refused. Now he lost himself in the blizzard. No one would ever find him, covered by his shroud of snow. The others would have to press on to the next supply dump without him. Perhaps they would make it. He never would.

Why was Oates the slowest in the party? They were all suffering from frostbite, exposure and malnutrition, but Oates was the worst. Why? We will never know for sure, but the smart money would be on his old war-wound re-opening due to scurvy. Ten years before, during the Boer War, Oates had been seriously wounded in the thigh — so seriously that when he recovered, one of his legs was an inch shorter than the other. One of the classic symptoms of scurvy is that it causes old wounds to first become painful and then to re-open.

Scurvy was always a menace to polar expeditions. In 1875 the Nares expedition had to be abandoned due to scurvy. Robert Scott, the leader of this South Pole expedition, had seen first-hand the dreadful deaths of scurvy victims: joints black, arms and legs swollen like balloons. In the end, said Scott, “death is a merciful release.” So he took expert medical advice. He had hoped that with careful precautions, this time they would be free from the disease. But to no avail. Just like all his previous expeditions, scurvy struck anyway.

Looking back on the story, the puzzle to us now is why Scott did not know the cure for scurvy. These days, even school children could tell you about James Lind and how he discovered around 1750 that lime juice was the cure. They could tell you that sailors in the Royal Navy were issued a daily lime juice ration and were called ‘limeys’ because of this. How could Scott in 1912 not know the cure?

Robert Scott was no fool. He knew about lime juice and lemon juice. He knew the story of James Lind just as well as the school children. Yes, in 1799 a lemon juice ration had been made regulation issue on Royal Navy ships. But by 1912, it didn’t seem to work.

In 1875 the Nares expedition set out to reach the North Pole by way of Greenland. Half of the sledging party fell ill with scurvy. Even sailors who stayed on board ship fell ill with scurvy. The regulation lemon juice was no help in pre-

venting or curing it. The expedition had to be abandoned. Parliament and the Admiralty each held a separate enquiry into this embarrassing fiasco. The only clear lesson to be drawn was that lemon juice did not reliably prevent scurvy.

If it didn't work now, had it ever worked? By the start of the twentieth century, there was no reliable cure for scurvy. It continued to plague polar expeditions, but it also struck elsewhere. Sometimes it even killed middle-class babies at home in England. So what was the cause? And what was the cure?

In the last decades of the nineteenth century the greatest advance in medicine was the germ theory of disease. It turned out that most diseases were caused by tiny microbes invisible to the naked eye. In 1912 the accepted explanation for scurvy, championed by the formidable professor of pathology Sir Almroth Wright, was that it too was caused by microbes. Scurvy was an "acid intoxication" caused by "ptomaine poisoning" due to eating badly preserved meat or fish. As Scott explained in 1905:

I understand now that Scurvy is believed to be ptomaine poisoning caused by the virus of the bacterium of decay in the meat. And in plain language, as long as man continues to assimilate the poison, he is bound to become worse.

And the cure? Fresh vegetables might help because they were alkaline. Fresh meat might also help, because it was free of "ptomaines." Damp, cold, and over-exertion would contribute to the disease. This was the best medical advice of the day, the advice that Robert Scott took when planning his expeditions.

Sledging across the polar ice-sheet, fresh vegetables were in short supply, and in any case wouldn't cure the disease, only hold it at bay. The only cure would be to stop eating the poison. The best way to avoid that in polar regions would be to eat fresh meat — seals in the Antarctic — or to be utterly scrupulous about the quality of the tinned meat. Which Scott was.

Scott did his best to follow expert medical advice but unfortunately for him and his men, it was wrong. Despite Lawrence Oates' noble sacrifice, Robert Scott, Edward Wilson and Henry Bowers died around the end of March 1912, trapped by a blizzard only 12 miles from the next food dump, but too weak to continue. They had made some progress after Oates left them, but not enough. They died from many things, including bad luck and bad judgement, but without scurvy they would probably have made it.

The truth was just around the corner. Even while the Antarctic snow fell on the bodies of the explorers, back in London, Casimir Funk had a new explanation for scurvy. Funk, working at the Lister Institute, said that scurvy was actually a deficiency disease, caused by a lack of chemicals that he called *vitamines*. Other

diseases like beriberi and rickets, he said, had similar causes. Funk's explanation turned out to be correct.

In retrospect, the crucial breakthrough had actually come in 1907 with the discovery in Oslo by Axel Holst and Theodor Frölich of an animal other than humans and monkeys which also suffers from scurvy: the guinea-pig. Amazingly, no other animals in the world suffer from the disease, only humans, monkeys and guinea-pigs. Clearly, guinea-pigs are far more convenient lab animals than the alternatives. Holst and Frölich had accidentally found how to induce scurvy by feeding the guinea-pigs a particular restricted diet. Soon they demonstrated that raw cabbage, apples or lemon juice would cure the scurvy. But progress in science is often slow and uncertain. With the weight of Sir Almroth Wright and most of the medical establishment behind it, the "acid intoxication" and "ptomaine" theory still held sway when Scott left for the Antarctic.

It wasn't until 1918 that Harriette Chick and Ruth Skelton at the Lister Institute solved the puzzle of the disastrous 1875 Nares expedition. They showed that guinea-pigs with scurvy could be cured with fresh lemon juice, but fresh lime juice had a much weaker effect and preserved lime juice was totally ineffective. They also tested Royal Navy 'lime juice' and found it to be almost useless. The problem was the preservation process: boiling to concentrate the juice destroyed the active ingredient and the copper vessels used commercially made the destruction even more complete.

A few months later, in 1919, Alice Smith, also at the Lister Institute, finished an exhaustive search through the Admiralty archives. She discovered how the Royal Navy had found and then lost the cure for scurvy. It's a curious and instructive tale whose finer details have been fleshed out further by other historians. As the school children said, the story does start with James Lind around 1750. Sort of.

James Lind was apprenticed to a surgeon at age fifteen and later joined the Navy as a surgeon's mate. In those days before anaesthetics, surgery was a brutal affair. A ship's carpenter maintained the wooden fabric of the ship and a ship's surgeon maintained the sailors who provided the muscle power. In the smoke of battle, with splinters flying, the tools they used were remarkably similar. On the more usual quiet days, the ship's surgeon attempted to treat various chronic ailments. The most frequent and serious was scurvy.

Despite the confusion amongst learned men of medicine, ship's surgeons had known about scurvy for centuries and passed down the knowledge of how to treat it to their surgeon's mates. The secret was fresh vegetables, but citrus fruit was especially effective.

In 1747, while Lind was surgeon on HMS Salisbury, he tried a number of popular remedies for scurvy including fresh oranges and lemons. The oranges and lemons cured the seamen in a few days and they became fit for duty. Nothing else worked. The experiment was not very thorough by modern standards and it's not

clear that it really happened in the way that he described, but the conclusion was clear. The next year Lind left the Navy to study medicine at the University of Edinburgh. He took his MD by thesis, but curiously what he wrote about was not scurvy, but venereal diseases. He published his famous *Treatise on Scurvy* a few years later.

By 1758 Lind had rejoined the Navy and was chief physician at the Royal Naval Hospital Haslar. In his first two years there, the hospital had about about 6000 admissions and of these about 1 in 5 was for scurvy. Presumably he cured these with fresh oranges and lemons. However, this is not the remedy that he recommended in his *Treatise on Scurvy*. After describing his experiment, he instead recommended preserved lemon juice, made by almost boiling it to concentrate it. This would have been more convenient to take to sea because it would not spoil. The disadvantage, of course, was that lemon cordial made like this would never have worked in practice because the heat would have destroyed the vitamin C, especially if it was heated in copper vessels.

Now, the fact that a particular remedy for scurvy did not work in practice had not previously stopped the Admiralty. Against the advice of ships surgeons, they chose “elixir of vitriol” for the Anson circumnavigation of 1740. Anson set out with 8 ships and 1854 men. When he returned four years later he had only one ship and 188 men. Over half of the dead were killed by scurvy. But in Lind’s case it was probably his almost painful shyness that stopped his remedy being adopted. This, coupled with his humble origins, was no match for the bold, upper-class higher echelons of the Admiralty. To find the true origins for the cure to scurvy in the Royal Navy we need to look elsewhere: to the almost unknown Thomas Trotter and Gilbert Blane.

Thomas Trotter was a poor boy made good: the son of a baker, he became a surgeon’s mate in his late teens. By 1783, aged 23, he was certified competent by the Liverpool Infirmary so that he could get a job as surgeon on a slave ship. (A career choice which clearly makes him unsuitable as a modern-day hero.) To encourage a greater interest in the health of the human cargo, the poorly paid ship’s surgeon on a slave ship was usually given two slaves on the coast of Africa. If they survived he could cash them in as a bonus when they got to America.

Perhaps Trotter had been told how to cure scurvy by other ship’s surgeons, or perhaps he had heard of Lind’s ideas. Perhaps he had even read about the Pacific voyages of James Cook who had recently been awarded the Copley Medal by the Royal Society for his remarkable achievement of completely preventing any deaths from scurvy amongst his crew. However he acquired his knowledge, Trotter put it to use and experimented on the slaves. He found that sour, unripe fruit worked better than ripe fruit and he perfected a way of preserving lemon juice by straining it and bottling the juice with a covering layer of olive oil. This was still effective against scurvy over a year later off the coast of Africa.

Trotter used his profits to go on and study medicine at Edinburgh where he wrote his own monograph on scurvy. A few years after getting his MD he joined the Royal Navy. He became second in command of the Haslar naval hospital and physician of the Channel Fleet. Trying to repeat his local success against scurvy more widely, he campaigned for the general use of lemon juice on board ships, but little changed until Gilbert Blane arrived on the scene.

Gilbert Blane was altogether more refined, a gentleman's physician with excellent connections in society. Later in life he became personal physician to the Prince Regent and was given a knighthood. Blane was notoriously icy in his bedside manner, earning himself the nickname "Chilblaine." (To a modern eye, Blane looks a lot like someone with mild autism.)

Ten years older than Trotter, in 1780 Blane was in the West Indies as personal physician to Lord Rodney, admiral in command of the West Indies fleet. Blane persuaded the admiral to order the West Indies fleet to start keeping systematic records of cases of scurvy. He found that 1 in 7 sailors died of scurvy, versus less than 1 in 200 through enemy action. He then started campaigning, on purely economic grounds, for better food for sailors, particularly citrus fruit. He also experimented with preserving lemon juice by adding a small quantity of alcohol. By 1782, the death rate in the West Indies fleet was reduced to 1 in 20.

These ad-hoc arrangements, depending on the judgement of particular admirals, persisted until 1795. By then Blane was back in London with a thriving private practice amongst high society. One of his patients was the First Lord of the Admiralty who appointed Blane to the Navy's Sick and Hurt Commission. And so it was in 1795, when the Navy Victualling Board turned down yet another of Thomas Trotter's memoranda on the advantages of lemon juice, that Trotter finally found a sympathetic ear on Blane's Commission. In August 1795 the Admiralty approved the issue of lemon juice to the fleet at Portsmouth and by 1799 to all Royal Navy ships everywhere in the world. They had found the cure.

Scurvy more or less disappeared from the fleet. At the end of the Napoleonic wars, the death rate had fallen from 1 in 7 to 1 in 150 — a nuisance rather than a scourge. As a consequence, the Royal Navy could afford to wait off the coast of Europe literally for years, blockading the ships of Napoleon's empire, like a vast pirate fleet waiting patiently on the horizon. Over the course of the Napoleonic wars, lemon juice probably doubled the effective strength of the Royal Navy. Historians have speculated that if this improvement had come just a few decades earlier, perhaps Britain would not have lost her North American colonies.

But then what happened? When the war was over, the world settled down to a relatively peaceful existence with the Royal Navy the undisputed master of the world's oceans. Sailors continued to be issued lemon juice, but at some point something changed without anyone noticing.

Writing in 1919, Alice Smith at the Lister Institute uncovered the tragic twist

in the story from the Admiralty archives. She found that in 1845 the Governor of Bermuda made a proposal to use the juice of limes from British colonies in the West Indies instead of buying lemons from Europe. It would be more patriotic. So, with the scent of Admiralty money in their nostrils, entrepreneurs set up huge lime plantations in the West Indies. By 1860 the deal was done and the Navy was supplied solely with West Indies limes, which they assumed were equivalent to lemons. After 1869 this lime juice was bottled in Liverpool.

But as Chick and Skelton had discovered in 1918, even without further damaging preservation, West Indies limes after their voyage to England had only a quarter the effect of fresh lemons. Without realising what they had done the Admiralty had lost the cure for scurvy and set the stage for disaster on polar expeditions.

By now you are probably saying to yourself: this is quite interesting, but what has it got to do with tyrants or hackers? Well, hackers are experts at finding and applying the hidden rules, experts at how things really work. If you want to do that yourself, there are some vital lessons in this story.

Firstly, there's the lesson that an authority like Almroth Wright is always happy to give you advice, with an air of confidence that makes it hard to resist. But they are not always correct. Robert Scott listened to the best advice medical authorities could give, and it turned out to be completely wrong. The authorities were full of opinions, but didn't really justify them. They expected to be believed, and they were believed, *because of their authority*, not because they had evidence to prove their case. Clearly, we need to be able to sort out truth from nonsense for ourselves and come to our own conclusions. How can we do this? In the next few chapters I will show you how to evaluate evidence for yourself and how to see when the conclusions are not justified by the facts.

Secondly, there's the lesson that the history you were taught in school is not always the history that actually happened. Sometimes the difference between the accepted story and what actually happened is breathtaking. The true story of the cure for scurvy is just one example.

Thirdly, if you are going to be an effective hacker you need to be as healthy as possible. Your body is where your mind lives so you need to look after it. You'll also want to look after your family and help your friends. But over the last few decades the advice that we have been given by authorities on nutrition has been even worse than Almroth Wright's ideas on scurvy. There are curious echoes from the past of opportunities wasted, of cures found and lost. I want to explore this topic in the remainder of this chapter and give you my best idea of what you can do for yourself. Of course you'll still have to make your own mind up, but by the time you've finished the first few chapters of this book you should be well equipped to do that.

So, where to start? Nowadays, we know all about the vitamins, don't we? In 1928 Albert Szent-Gyögyi isolated pure crystalline vitamin-C, which he named

ascorbic acid. Only when it was proved to cure scurvy in guinea-pigs, was Almroth Wright finally convinced that his “acid-intoxication” theory was wrong. Szent-Gyögyi won the Nobel prize for medicine in 1937. The minimum intake of vitamin-C needed to prevent scurvy is rather small, but how much more is the best amount to take? What is the right amount to be healthy? In 1970, Szent-Gyögyi wrote:

As to ascorbic acid, right from the beginning, I felt that the medical profession misled the public. If you don't take ascorbic acid with your food you get scurvy, so the medical profession said that if you don't get scurvy you are all right. I think this is a very grave error. Scurvy is not the first sign of the deficiency but a premortal syndrome, and for full health you need much more, very much more. I am taking, myself, about 1g a day. This does not mean that this is really the optimum dose because we do not know what full health really means and how much ascorbic acid you need for it. What I can tell you is that one can take any amount of ascorbic acid without the least danger.

Today, in 2011, the U.S. recommended daily allowance for vitamin C remains close to the scurvy-prevention level of 90mg per day. We still don't know how much people need to be in the best of health, as opposed to merely being not sick. The situation is made more confusing by the clear fact that different people need different daily amounts of vitamin C to achieve a particular level of health. Even taking Gilbert Blane's statistics from the eighteenth century, the fact that 1 in 7 sailors died of scurvy meant that 6 in 7 *didn't*. The ones who died were presumably the ones with the greatest need for vitamin C, and clearly this need varies widely.

The medical establishment appears to have resolved this difficulty by turning its back on the problem. The Almroth Wrights of our own age seem to have a keen interest in treatments for diseases which involve new drugs, but have cultivated an active disinterest in nutrition. Research programmes on drugs are large and well-funded. Even when drug trials show only slight benefits, they are used to support vast prescriptions by doctors. In contrast, research programmes on nutritional supplements are mostly small and underfunded. Even when these trials show large, clear benefits, the results are questioned: more research is always necessary before any changes can be recommended.

For example, let's look at the study conducted in 2002 by Bernard Gesch, a physiologist at Oxford University and Director of Natural Justice, a charity which sponsors research into the effect of nutrition on violent and anti-social behaviour. Gesch's team conducted a randomised, placebo-controlled double-blind trial, the “gold-standard” of clinical trials, on 231 of the inmates at Aylesbury Young Offenders Institution. Half of the prisoners took a daily dose of 28 vitamins, minerals and

fatty acids; the other half took a placebo. The levels of the vitamins and minerals were only the small “recommended daily allowance” so it’s unlikely that anyone could tell who was getting the placebos. The staff giving out the pills certainly didn’t know. After 9 months, the result was a surprising 37% reduction in serious or violent offences compared to the “control” prisoners taking the placebo. And these offences were not for trivial rule-breaking, but “governor reports,” serious enough to lose a prisoner the chance of parole.

Gesch’s explanation is that some of the prisoners were suffering from “subclinical malnutrition,” and though they didn’t show signs of any deficiency disease, the food supplements presumably helped to correct this. The idea that prisoners have a right to adequate nutrition is not contentious. We have nothing but revulsion for the Japanese who in world war two gave polished rice to their prisoners in the full knowledge that it would cause the deficiency disease beriberi. Surely, a decision to withhold adequate nutrition from modern-day prisoners is different only in degree, not in essence?

But what do we find? Prevarication, repeated calls for more investigation and poo-h-pooing the methodology of the trial (which was in fact impeccable). The supplements were criticised because they only solve part of the problem: most of the previous violence still happens. But so what? Some people were helped, presumably those with the greatest need for the supplement, the ones who were most malnourished. People vary. The supplements were criticised because they change how people think. As though helping people think better by preventing malnutrition is equivalent to mind control. It isn’t. The supplements were criticised because we don’t know exactly how they work. The critics say they will support the supplements when they know exactly what it is in the supplements that could make a difference.

Modern scientists like Bernard Gesch must feel a lot like Thomas Trotter, writing fruitless memoranda to the admiralty year after year, trying to get them to adopt lemon juice. Without the cool clarity of Gilbert Blane in a position to say yes, that might never happen. Don’t mistake institutional inertia for prudence.

This still leaves us with the question of whether it is worthwhile for *you* to take vitamins or other food supplements, and if so how much? Personally, I think that taking about 1g of vitamin C a day seems prudent, also around 1000mg of omega-3 fatty acids and 1000 I.U. (25 μ g) of vitamin D₃. (Vitamin D has different variants and D₃ is most effective.) It’s probably not necessary to take other vitamins or minerals if you are eating a varied diet. If you do think you need them, be careful that you *don’t take too large a dose of vitamin A* by accident. Almost every multi-vitamin pill seems to contain the RDA of vitamin A, which is ironic since vitamin A is practically the only vitamin which it’s easy to get an overdose of. Read the labels carefully and do your own research.

Vitamin D seems to reduce cancer and has other health benefits — for example

it can reduce both viral infections and depression. Even though your body manufactures vitamin D, you almost certainly don't have enough of it. If you have white skin and stand out in the summer sunshine, 15 minutes of full-body exposure a day will generate enough vitamin D to keep you healthy. (You'll need to stay out longer if you have darker pigmented skin.) But who does that? In northern countries in winter the sunlight is too weak, and even in summer, we are told to keep out of direct sunshine and to put on sun-screen, to protect us from skin cancer.

This is especially unfortunate since skin cancer forms a small fraction of cancers. It is relatively easy to spot and fairly straightforward to treat. It's probably too early to say for sure, but when the verdict is finally in, we may find that the advice on sun-screen has accidentally killed several people for every prevented case of skin cancer. The story of vitamin D has echoes of the "ptomaine" poisoning theory of scurvy. Are elevated levels of cancer in northern countries due to poisonous pollutants contaminating the environment? Perhaps, but Reinhold Vieth at the University of Toronto thinks we may be "looking for a bogeyman that doesn't exist" and that "it's more likely a lack of vitamin D." So don't get sun-burnt, but do enjoy the **sunshine**. It's good for you.

Omega-3 is helpful because it counteracts an imbalance in the fatty acids in our modern diet. In the past we had roughly equal proportions of omega-6 and omega-3 fatty acids. The Japanese, with a high-fish diet, still have roughly equal levels of omega-6 and omega-3. Nowadays in the West we have vastly more omega-6 in our diet, mostly from long shelf-life processed foods. The Western ratio between omega-6 and omega-3 is more than 10 to 1. This imbalance makes a difference because it changes the chemical properties of the cells in our brains. It changes the way we think.

For example, researcher Joseph Hibbeln found that people with low levels of omega-3 in their spinal fluid also had low levels of serotonin. Since low serotonin is found in people with depression, some kinds of depression may be caused or made worse by low omega-3. Studies using omega-3 supplements to treat depression have had some success. It certainly won't do you any harm to try restore your omega-3 levels to the balance we used to have, by taking a supplement and trying to eat more foods like fish and olive oil that are naturally high in omega-3.

(But if you are on an SSRI medicine for depression, *don't stop taking it!* SSRIs take several weeks to achieve their effects, and have severe withdrawal symptoms. You need to proceed carefully. But it would be better if you didn't need to resort to such drastic drugs in the first place. Many of them are not much better than placebos, except for the side effects, which are real enough. Not all depressions are the same, and many instances of depression may actually be a normal and productive response to severe difficulties, not a disease. We'll return to this alternative explanation for depression in a later chapter.)

After micro-nutrients like vitamins, let's now turn our attention to macro-nutrients — in other words, to **food**. Clearly you need to have enough food, so that your body has the energy it needs, and you need to have clean water to drink. If you don't have these, then what I have to say in this chapter must seem conceited and irrelevant. In that case, I can only hope that some of my advice in later chapters might still be useful to you in the long run.

For most people in the rich part of the world, the main problem is not quantity of food but quality. It's important to eat a variety of food, and to try to avoid processed food, which is not designed to be good for you, but rather to be profitable and have a long shelf-life. Above all, avoid "low-fat" foods, sugar and pure "white" carbohydrates. In the 1960s and '70s the rate of obesity in the USA was about 1 in 8. From the 1980s to the present day it has risen steadily, to the current figure of over 1 in 4. (The worst states in the USA have figures around 1 in 3. No single state is as good as the 1970s national average.) Something changed around 1980. What was it? The clearest culprit is the "low-fat" diet promoted by the US Congress and then the National Institutes of Health.

In 1950 Ancel Keys at the University of Minnesota proposed a theory that eating fat raises cholesterol and causes heart disease. The evidence was equivocal, so the US government spent several hundred million dollars over the following decades on five studies that tried to prove a link between eating fat, poor health in general and heart disease in particular. They failed — no clear link was found. Not to be discouraged, they spent more money on a sixth study which tried to show that a drug to lower cholesterol would reduce heart disease. This study succeeded. But we can see that's not the same thing, is it? If a drug reduces heart disease and lowers cholesterol, that doesn't mean it reduces heart disease *because* it lowers cholesterol. Think, for example about aspirin. We know that aspirin reduces heart disease and we know that aspirin reduces headaches. But no-one is silly enough to claim that aspirin reduces heart disease *because* it reduces headaches.

Brushing over this problem with their evidence, these scientists declared that they had proved what they were trying to prove all along: that eating fat is bad for your health and causes heart disease. This became the new health dogma, replacing the previous consensus that it was eating potatoes, pasta, white bread, sugar — pure carbohydrates — that made you fat. Companies swept in with new low-fat product ranges, and health-conscious consumers bought them eagerly. Unfortunately, we have to get our energy, our calories, from somewhere and fat is high in calories. If you take the fat out of food, you need to replace it with something else, so in practice, a low-fat diet is high in carbohydrates. An earlier generation would have expected this to make many people obese, and it has. This outcome has a tragic irony, since the only point of the low-fat diet was to reduce heart disease, but obese people suffer more from heart disease and have a host of other medical problems too.

The pendulum of scientific opinion is slowly swinging back the other way, since we now know why high-carbohydrate food tends to make everyone fat and drives the bodies of some people to obesity. It works like this. The cells of our bodies are capable of burning two kinds of fuel: fat and glucose. In prehistoric times, and in modern hunter-gatherer societies, carbohydrates were quite rare, and most of the time people's bodies ran on fat. The fat cells in your body are like little batteries storing and releasing this fuel, and they are very dynamic, continually emptying and filling in response to your body's minute-by-minute need for energy. When you are exerting yourself, on balance they are emptying. Afterwards when you feel hungry and eat a meal, on balance they are refilling.

Several hormones influence this emptying and filling, but the dramatic "master switch" hormone over-riding all the others is insulin. When you eat fat, this has no effect at all on your insulin. When you eat protein, your level of insulin increases slightly. But when you eat carbohydrate, your level of insulin surges. The purer and whiter the carbohydrate, the bigger the surge. All carbohydrates eventually get broken down into glucose, but refined white carbohydrates are easier to digest, so the glucose arrives in the your bloodstream in a more concentrated rush. A high concentration of glucose is something of a problem for the body, and if not quickly used or stored away can cause all kinds of damage.

The surge of insulin signals to all your body's cells that they need to drop what they are doing and deal with this problem. Insulin's main effect is to cause cells to switch from burning fat to burning glucose. But insulin also stops fat cells continually emptying and filling. In the presence of insulin, they only fill, they don't empty. In the presence of insulin the fat cells also take up some of the glucose and use it to help them store even more fat.

So carbohydrate drives insulin and insulin drives fat accumulation. If you eat lots of carbohydrate, you will have generally high levels of insulin, your fat cells will fill more than they empty and the quantity of fat they store will gradually increase. That's what happens on a microscopic scale. On a larger, human scale you will get visibly fatter over a period of years. And yet, while your body has high levels of insulin, your fat cells will not release this stored fuel. Even though you are visibly fat, you cannot access that stored fuel. This explains the otherwise baffling phenomenon of poor people who are obese *and* undernourished. Because they are poor, they can only afford to eat carbohydrate. The carbohydrate drives up their levels of insulin, and the high levels of insulin make them fat.

To make things worse, about 1 in 3 people are prone to become "insulin resistant." In other words, when they eat the same amount of carbohydrate, their body produces more and more insulin. This is necessary because of a gradual change in their cells: over time they need more and more insulin before they will switch from fat-burning to glucose-burning. This insulin makes their fat cells fill and not empty, just as before, but the higher level of insulin means that their fat cells are

locked in this state almost all the time.

What triggers insulin resistance in the first place? For those people who are susceptible, maybe a high-carbohydrate diet is enough by itself, but there is some evidence that the culprit could be fructose. (Common sugar is half glucose, half fructose. Fructose from maize is an ingredient in soft drinks and many processed foods.)

Eventually people with insulin resistance will suffer from adult-onset diabetes when their body cannot ramp up its insulin production any further. It should be no surprise that on the high-carbohydrate low-fat diet recommended by health authorities in the USA, the obesity rate is now approaching 1 in 3. That's everyone who is prone to insulin resistance.

The saddest part of this statistic is that all these people are made to feel guilty about being obese — the conventional view is that they have only themselves to blame. If only they were less greedy or less lazy, say the authorities, then these people would be fine. But really, the obese are for the most part no more guilty of sloth and gluttony than thinner people. Really, they are mostly just victims of a hormone disorder caused by excessive carbohydrate consumption.

To be healthy, you should also take a moderate amount of **exercise**. Health is mixed-up in our modern ideas with fitness — a “health club” is in fact an exercise club. Don't over-do it though, and don't do much more than you are used to. It will help you to be healthier and feel happier, but it won't have any predictable effect on your weight. If you exercise more you might lose weight or you might gain weight. (When you exercise more you feel hungrier and eat more, and the composition of your body changes.)

You also need to make sure that you get enough **sleep**. Depression and anxiety are the biggest causes of insomnia and lack of sleep may in turn cause cellular damage to the brain. Sleep continues to be a mystery to science, although some progress has been made in recent years. In particular no one really knows what sleep *does*, so no one really knows precisely what happens when we don't get enough. We can measure some of the effects though: if you don't get enough sleep, your immune system will be worse, you'll have a faster pulse rate and higher blood pressure and you'll be more prone to develop insulin resistance. So, you're more likely to become obese if you don't get enough sleep.

All animals, no matter how primitive, need sleep. Marine animals usually can't go fully to sleep — they need to keep moving — but one half of their brain sleeps, then the other. Something really fundamental is going on here. The most plausible idea seems to be that sleep is necessary for cellular repair. Curiously, smaller animals sleep longer than larger animals. For example, mice sleep for 14 hours a day, elephants for only 4 hours. Researchers Van Savage and Geoff West looked at this data more closely and came to an interesting conclusion. When you adjust for metabolic rate, time spent asleep scales with the size of the animal, but

it doesn't scale with the size of the animal's body. *It scales with the size of its brain.* So presumably sleep's primary function is to repair your brain cells.

If you want to be an effective hacker, you need your brain to work well, and despite the stereotype of the computer hacker staying awake all night fuelled by sugar and caffeine, this is a pretty stupid habit unless there's an emergency. Being awake for more than 24 hours causes an impairment similar to being legally drunk, over the limit for driving. (Though it's even worse for the first 30 minutes after waking up, even from a good night's sleep: during that first 30 minutes, performance is worse than after 3 days without sleep! Don't ask someone for a decision just after you wake them up, not unless you *want* the wrong answer.) When you miss a night's sleep there's a payback: as an adult if you miss one night completely, you need at least three good nights to catch up. If you have only five hours for an extended period, not only will you be impaired while you are awake, it will take you weeks and weeks of good sleep afterwards to recover.

How much sleep do you need? Eight hours sleep is enough for most adults. (That's eight hours actually asleep. We don't count going to bed and reading or watching TV.) Six hours isn't enough. Children and teenagers need more — ten hours or perhaps more. You might say, I don't need that; my children don't get that. Well ... you *do* need it! And if your children are irritable, hyperactive and overweight, then they need more sleep too.

Troublesome people tend to get diagnosed as "sick," particularly in the USA. Children who are hyperactive and irritable are likely to be given a diagnosis of ADHD and put on drugs like Ritalin, which are essentially just "speed" — they help you to stay awake longer and cope with less sleep, but they mask the real problem. It's like buying ear-defenders because your car is making a squeaking noise. It helps you cope, but it doesn't solve the problem.

After those major factors, there are a couple of others which will help your body or mind to work better. Despite the fact that tobacco helps you concentrate, it should be fairly obvious that you should **not smoke**. It'll give you cancer and heart disease, cost you a lot of money and make you smell. You should have only a **little alcohol**. Apart from other effects, like helping you to fall over and get into fights, alcohol interferes with your ability to learn new things. If you learn something today and sleep on it, then without any more practice you will be better at it tomorrow, provided you get a full night's sleep (six hours isn't quite enough). If you learn something today and drink alcohol tonight, you will go to sleep more easily but it's not the same sleep. Your REM sleep will be suppressed, and you won't be any better tomorrow at what you learned today.

I think I've covered the major things that you can change right now to improve your health. If you turn to the notes for this chapter at the end of the book, you will find a few other ideas and some pointers to further reading. However, I think

we have now reached a point where the next most important thing to understand is how to make up your own mind about things, and that is the topic of the next few chapters.

Chapter 2

Morals

In 2001, the US Supreme Court decided that walking was not a fundamental part of the game of golf. The justices said that the fundamental thing in golf is trying to get a small ball into a slightly larger hole. Walking, they said, is incidental. This surreal decision was not unanimous — two out of the nine justices dissented. These two judges complained, quite reasonably, that the Supreme Court had no business ruling about whether or not walking was part of the ideal “Platonic” version of golf. The question came before them because of a legal dispute about whether professional golfer Casey Martin should be allowed to ride between holes on a golf cart during competitions.

All his life, Casey Martin had suffered from a circulatory problem in his right leg. Walking around a golf course was for him a dangerous activity, risking internal bleeding, broken bones and maybe even amputation. So he used a golf cart. The Professional Golfer’s Association, or PGA, said that although they let golfers use carts in the earlier stages of their open competitions, they wouldn’t allow them in the later stages. Despite Martin’s other talents for golf, this effectively stopped him following up on his earlier successes. He claimed that this was discrimination, and against the law, since the law said that reasonable accommodations must be made for people with disabilities. And so, eventually, this legal case made it to the Supreme Court.

The PGA wheeled out big names like Arnold Palmer and Jack Nicklaus to testify that walking was a key part of the game. They said that it wouldn’t be fair if some golfers could use carts. It would give them an advantage, because fatigue was an important factor, and those who chose to ride would be less tired. Those were the arguments put forward, but if we dig beneath the surface we see that really there was something else at stake.

In his 2009 Reith lectures, Michael Sandel points out that in this case, the legal arguments about fairness obscured the real issue. Casey Martin was not asking for everyone to be allowed to ride in carts, only himself, and as the Supreme Court pointed out, because of his disability he already suffered more from fatigue than anyone else. Sandel explains the real issue:

But if fairness were the only thing at stake, there would have been an easy and obvious solution: let *all* golfers use carts in tournaments. But

this solution was anathema to professional golf, even more unthinkable than making an exception for Casey Martin. Why? Because the dispute was less about fairness than about honour and recognition — specifically the desire of the PGA and top golfers that their sport be recognised as an *athletic* event.

If all golfers rode around in carts, then the game would be just a little too close to some other games played on a green surface with small balls and slightly larger holes. Games like snooker and billiards, for example. The issue at stake was a moral one, but it was not “fairness.” It was what we will soon recognise as “ingroup/loyalty” — in this case whether professional golfers deserved recognition and respect as members of that group we call athletes.

Most serious arguments, the arguments we care deeply about, are moral arguments like this. But often, as in this case, the true deeper argument is hidden behind a different surface argument. Maybe this is because the surface argument seems easier to win or because it seems more respectable. Often the participants get so wrapped up in the surface argument that they don’t even realise that there is a deeper moral argument.

There seem to be only five or six fundamentally different categories of moral argument. If you understand these categories, you will be able to understand other people’s motivations better and make more convincing arguments yourself. But before we can explore these categories properly, we need to talk about human emotions — and before we can talk about emotions properly we need to understand the “adaptive unconscious.”

The word “unconscious” still carries connotations from Freud: a seething pit of repressed desires, barely held in check, threatening to boil over with untold consequences. But as the saying goes, “There’s only two things you need to know about Freud: he’s wrong and he’s dead.” Freud’s idea of the human unconscious has been comprehensively disproved by modern research. (If he were alive, I’m sure he would be the first to update his theory. Since he isn’t, this makes him an easy target.)

Modern psychologists use terms like “the adaptive unconscious” to distinguish their new understanding from the old ideas. In this new understanding, most of the human mind works automatically, like an autopilot, beneath the level of conscious awareness. Our conscious minds are like airline pilots, eating their lunch and chatting, only alerted to something out of the ordinary by a flashing light on the control panel. Or perhaps we should say that the adaptive unconscious is like several interlinked autopilots, since we know from studies of brain-damaged patients that there are many independent, but rather limited, unconscious abilities. Consciousness on the other hand seems to be one thing, which is either there or not. In contrast, brain-damaged stroke patients can lose their unconscious abilities piecemeal: they may be able to draw an object but not say its name, or to speak

but not to sing. Or even more bizarrely, to recognise their family members by appearance, but think that they have been replaced by impostors, because the stroke victim has lost the unconscious feeling of “familiarity” that we have when we see someone we know. They still recognise their family, but in the same way that you would recognise someone from a photograph: consciously and with effort.

A key property of the adaptive unconscious is that it is effortless. It is fast, uncontrollable, concerned with the here-and-now. It tends to jump to conclusions easily, to make quick decisions, but it’s rather inflexible, with “fixed ideas.” It’s really good at spotting patterns, but tends to be confused by patterns that are too complex or subtle. It’s so good at spotting patterns that it even sees patterns in randomness, like seeing faces in clouds. Our conscious minds, on the other hand, are rather slow, after-the-fact plodders, checking whether our gut-feelings are really right. The conscious is more flexible, and takes a longer view. With conscious effort we can see where we have gone wrong and take steps to correct it.

It’s almost as if we were two different people, each barely aware of the other. It’s certainly the case that our unconscious can make a quick decision without our conscious mind being aware of what happened. We are even able to come up with with after-the-fact justifications for our actions, but as experiments with split-brain patients have shown, our conscious explanations for our own actions are not necessarily correct. We don’t get to see behind the curtain, to inspect the workings of the autopilot; we don’t have privileged access to our own unconscious minds. Experiments have shown that we are no better at explaining our own actions than explaining those of other people, and that we are actually worse at predicting what will make us (unconsciously) happy in the future than we are at making predictions about other people.

Psychologist Timothy Wilson, in *Strangers to Ourselves*, relates how people looking to buy a house can think they know what they want, can draw up an elaborate check-list and try to consciously compare the features of one house against another, but it doesn’t really work. Trying to do this, the buyers become more and more confused about what they really want. Wilson notes that professionals selling houses have a saying: “buyers lie.” Buyers don’t of course lie deliberately: they are just really bad at knowing consciously what their adaptive unconscious will be happy with, before they’ve seen it. So, professional house-sellers pay no attention to what the prospective buyers say, and instead show them a wide range of properties. The house sellers watch their clients’ reactions closely. If they look pleased, that’s a sign that their adaptive unconscious likes this house. A prospective buyer might not consciously notice this themselves, and might even be resistant to it.

Our emotions are a kind of signal from some parts of our adaptive unconscious to the other parts, to our conscious minds and to the wider world. They change how we act and they change how we look. Emotions are like the background music

to our conscious thoughts. We often have emotions without being consciously aware of them, but if we pause to listen more carefully, we can get a better idea of what our unconscious mind is really doing, what we really want. But even when we do notice, and try to hide our emotions behind a “poker face,” they still leak out. We read each other’s emotions unconsciously, and someone who seems more empathic has an adaptive unconscious which is better at this, better at picking up and following subtle expressions. (You can also do this consciously, if you learn what to look for.)

It was a surprise to scientists in the late 1960s when psychologist Paul Ekman demonstrated that human emotions are universal — that facial expressions for emotion are the same all over the world. At the time, the respectable academic view was that expressions were socially learned, and varied between cultures, like language. This was Ekman’s own view before he started his work. However, in a series of ingenious experiments between 1965 and 1969 he showed that people from different cultures recognised and reproduced the same basic expressions. The last in this series of experiments took him to the isolated Fore people in New Guinea. Ekman asked them to choose photos that best fit a series of situations chosen to prompt particular emotions, such as “this person’s child has just died.” The results were very consistent with what westerners would choose, and very soon repeated by other researchers.

There was initially a huge resistance from the academic community to this heretical finding. The ruling idea at the time was that all human behaviour was due to “nurture” and none to “nature.” This was practically dogma, and to suggest otherwise was very unpopular. And how, people asked, could Ekman’s findings be reconciled with the fact that different cultures seemed, in similar situations, to show different emotions? Ekman explained this rather plausibly with the idea of “display rules”: different cultures have rules about the management of emotions, and these rules *are* learned socially. But the emotions themselves, and their expression when not masked, are just the same everywhere. Experiments have shown, for example, that in public the Japanese tend to hide negative expressions with a fake smile, but when they are on their own they have exactly the same expressions as everyone else. They also recognise the same emotions as everyone else.

Nowadays, Ekman’s findings about human emotions and expressions are generally accepted, and it’s even acknowledged that Charles Darwin was right all along when he wrote his book on emotions in 1872. (He said that human emotions and their facial expressions are innate, and to a large extent shared with other animals.) There are seven basic human emotions, and each has a distinctive set of facial expressions:

- **Anger** is indicated by tightened, thin lips and eyebrows pulled down over glaring eyes. With extreme anger, the lips are pulled apart in a square shape, like a snarling dog. We are angry when something’s not right. Ekman says:

“Anger informs others of trouble. . . . If another person is the source of our anger, our angry expression tells that person that whatever he or she is doing is objectionable.”

- **Sadness** is indicated by drooping, down-turned eyes with eyebrows pinched up in the middle and a mouth with pulled-down corners. With extreme sadness, the name hardly seems adequate. Ekman suggests “agony.” We are sad when we lose something or someone, or when we see the suffering of other people. Ekman says the message sent by sadness is “I am suffering; comfort and help me.”
- **Fear** is indicated by lips and chin pulled back towards the ears, with raised eyebrows over wide eyes. In a milder form, which we might call “worry,” we look more pensive, with a wrinkled brow. We are frightened when we are confronted with the prospect of pain or injury, especially when we can’t do anything about it. Physically, the emotion pumps up our heart rate and prepares us to run away.
- **Disgust** is indicated by the upper lip being pulled up, maybe exposing the teeth, and the nose wrinkled. We are disgusted when we need to avoid contact with something contaminating. This could be an object, a smell, a person or even an idea. The sort of thing that causes disgust can vary widely between cultures. Bodily waste is always disgusting, but food that one culture finds delicious can be disgusting to another culture.
- **Contempt** is distinguished by being the only asymmetric expression. It is indicated by a curled lip or sneer on only one side of the mouth. It’s related to disgust, but we feel contempt only about other people, not objects. We feel contempt when we feel superior to them, that they are not worthwhile people. (There’s also a sense of “looking down your nose” at someone, with a raised chin.)
- **Surprise** is the shortest emotion, and can only be expressed for a second or so. It’s related to fear, and can be confused with fear, since it too has wide eyes. But it’s distinguished by a generally slack expression and particularly by a round open mouth. Think of “slack-jawed amazement.” We feel surprise when something happens that is unexpected but not threatening.
- **Happiness** is indicated by a mouth with raised corners, but this is a sign that we can easily fake consciously, for politeness. A true smile, the “Duchenne smile,” also has narrowed eyes. The muscles causing this particular narrowing, which give us a “sparkle” in the eyes when we smile, are not under conscious control. If you learn to look for this you can tell if people are truly happy or just being polite.

Remember, these expressions are generated by our unconscious mind. If we try, we can hide them to some extent or fake them to some extent, but many of our facial muscles are not under conscious control. It's hard to hide emotions and even harder to fake emotions that we don't feel. These seven emotions are the "atoms" of feeling: in real life they come along in combinations and the expressions flicker across our face in fractions of a second. (Try freeze-framing an emotionally charged live TV show if you want to see this. Don't try this with a drama programme, though — the actors may not have the right expressions on their faces.)

I give these descriptions to remind you what the expressions look like, but if you don't already recognise them, my descriptions won't be much help. If you want to learn how to consciously recognise these expressions, particularly in their subtle forms, you will need to read a book like *Emotions Revealed* by Paul Ekman, or look at his web-site. With a lot of practice you could learn to be an expert, a "human lie detector" like Ekman himself.

But you don't need any practice to understand how the emotions relate to moral arguments. The key point here is that moral arguments and their underpinning moral values are driven by emotions. Like emotions, moral values are also largely "built-in," not learned. Psychologist Jonathan Haidt has investigated how people reach moral judgements, using stories like the following one:

Julie and Mark are brother and sister. They are travelling together in France on summer vacation from college. One night they are staying alone in a cabin near the beach. They decide that it would be interesting and fun if they tried making love. At the very least, it would be a new experience for each of them. Julie was already taking birth control pills, but Mark uses a condom too, just to be safe. They both enjoy making love, but they decide never to do it again. They keep that night as a special secret, which makes them feel even closer to each other. What do you think about that? Was it ok for them to make love?

Most people say "no." But that's not the point. The point is to find how people try to justify *why* it is wrong. Haidt found that people say that incest is bad because any children would suffer from genetic problems. Or they say that Julie and Mark will regret it and be traumatised. But neither of those reasons apply in this case: the story says that they used two forms of contraception and they were both happy about it afterwards. Haidt found that people don't change their minds, they reach for other reasons, and then yet other reasons to justify their gut reactions. Eventually they end up with something like "it's just wrong" or "it's disgusting." And far from being a cop-out, this last reason actually is the *real*

reason. People find it disgusting. The moral value tested by the story is based on an emotion, and the emotion is disgust.

Haidt has found five moral values which seem to exist independently in people. In organising these moral values, I find them easier to remember and understand when I relate them to each of Ekman's emotional categories. (Although my arrangement seems quite plausible, you'll have to decide for yourself whether it has anything more than mnemonic significance.) Here are Haidt's five moral values:

- **Fairness/reciprocity** concerns justice, rights and fair-dealing. People should get what they deserve and keep their promises. In the extreme this can prompt revenge and retribution. (To me, this seems to be based on **anger**, since we are angry when we feel that something is unfair or unjust.)
- **Harm/care** concerns care for others and preventing harm, especially harm to children. People should be kind and nurturing. (To me, this seems to be based on **sadness**, since we feel sadness in response to our own or other people's loss and suffering.)
- **Authority/respect** concerns knowing our place in society and doing our duty. People should respect traditions; followers should defer to authority; leaders should be trustworthy. (To me, this seems to be based on **fear**, or rather the avoidance of fear, since if you show appropriate deference to authority you avoid the threat of pain or injury which triggers fear.)
- **Purity/sanctity** concerns living in a sanctified and noble way. People should try to live in a less carnal way, and renounce activities and objects which are degrading. (I think everyone would agree that this is based on **disgust**.)
- **Ingroup/loyalty** concerns feelings of loyalty to your community. People should feel patriotism and be happy to sacrifice their personal interests to the family, tribe or nation. (To me, this seems to be based on **contempt** — we draw a distinction between “proper people” in our group and outsiders who are lesser people. We feel superior to them.)

Perhaps the first question in your mind is “why five, when there are seven emotions?” In fact, for a while Haidt had only the first four — ingroup/loyalty was added more recently. If, along with me, you believe that each moral value corresponds to an emotion, that means we must be missing two more. What might they be? Here are my suggestions:

- **Wonder/curiosity** concerns the urge to find out, to open Pandora's box, regardless of the consequences. So many stories revolve around opening the forbidden door, eating the forbidden fruit. Who can doubt that this is a deep human urge? (I suggest that this is based on **surprise**.)

Curiosity is the basis of science, but has only been a respectable thing for a few centuries. The ancients thought that curiosity about the natural world was rather like “looking up the underpants of god.” Those who poke their noses into the business of powerful people risk being destroyed, and it was only to be expected that the gods would feel the same way. Idle curiosity was no virtue. But in modern times, curiosity has become the mainspring driving science forwards.

- **Loving-kindness** concerns urges to cherish and honour other people, the feeling that all humans are one. (I suggest that this is based on **happiness**. We want other people to be happy. It’s a lot easier to be happy yourself when other people are happy first. It’s hard to be happy in the face of negative events, but happiness is definitely more than the absence of negative emotions.)

In his book on emotions, Darwin considered that sympathy was the most distinctive human emotion, because it was the one that was least in common with other animals. He thought that the relative helplessness of human children was an important factor: if parents didn’t have sympathy for their children, they wouldn’t last long. More than merely saving from them from harm, we want to cherish them and see them be happy.

We’ve now covered enough ground that you can see for yourself, from first principles, what the argument between the golfer Casey Martin and the PGA was really about. The PGA tried to make an argument based on fairness/reciprocity, an argument that said individual golfers would get an unfair advantage if they could use golf carts — these individuals would suffer less from fatigue. The Supreme Court didn’t buy that argument, saying that Martin already suffered more from fatigue anyway, even when he used his golf cart. As Sandel pointed out, the real argument was about something else. It was about ingroup/loyalty. The professional golfers thought of themselves, and wanted the public to think of them, as members of a fraternity of professional athletes. They saw themselves being expelled from this group, in the minds of the public, when a picture on TV showed a chap with a bad leg cruising up to the tee in his golf cart. (We might also add a touch of purity/sanctity to the mix — moral arguments are seldom absolutely clear-cut.)

When we understand the moral values and their emotional basis, then we can better understand other people’s points of view. We can avoid getting trapped in pointless arguments and we can address the fundamental issues that motivate people. We can also know when to give up! For example, I was once discussing the precise limits of their new diet with a recent convert to vegetarianism. They were explaining their decision in terms of environmentalism and treating animals fairly. I wondered what this person thought was fair and unfair — where did he draw the line? Clearly he thought that keeping cows for milk was unfair, but what about

bees? Was it unfair to keep bees? We need them to pollinate fruit trees, but was it okay to eat their honey? He had until that time been eating honey. I regretted asking the question, because afterwards he decided to stop eating honey, and at the time I couldn't really work out why.

Now, in retrospect, it's clear. Although he described his reasons for becoming a vegetarian in terms of fairness/reciprocity and harm/care, that wasn't his real motivation at all. His real motivation was purity/sanctity. (His simultaneous decision to stop smoking might have given me another clue, if I'd known back then about this classification of moral values.) When he thought about bees more closely, it must have struck him that honey was really bee-spit. He realised that honey was disgusting, and he couldn't eat it any more. No argument based on fairness/reciprocity or harm/care would have changed his mind. Even if I had known his real reasons, it would have been rather hard to change his mind about the purity of honey. Better to just let it go.

Because the adaptive unconscious quickly jumps to conclusions and then sticks to them, it can be very hard to change existing views. It's rather easier to influence views on a new topic, where someone's mind is not already made up. To do this, you need to use images and thoughts that are strongly charged with the relevant emotion. Dan Gardner, in his book *Risk* says "humans are good with stories and bad with numbers." Telling someone that there are a million starving children in a third-world country won't touch the adaptive unconscious where their emotions arise. But showing them a picture of just one starving child *will*.

Descriptions can be just as compelling, but they have to be vivid. More detail makes them more convincing. Stories, made up or hearsay, can be just as potent as direct experience, but the descriptions have to be viscerally compelling — if it's a struggle to imagine something it will seem less plausible. So: use novel metaphors, rhyming and alliteration; read poetry for inspiration; learn to write poetry; avoid tired old clichés. The initial feelings we have for something tend to stick, and with a strong enough emotion, people don't stop to wonder how likely it is. Instead they feel certainty.

As an example, consider the current British anxiety about paedophiles, stirred up by the popular press. This campaign has successfully employed all five of Haidt's moral values: we are encouraged to be angry because of the harm that might happen to our children. We are told that someone in authority needs to make sure that perverts from outside don't come and defile our loved ones. Stepping over the issue of why the newspaper owners want to wind people up in this way, notice that the numbers carry a different message. The numbers say that for almost all children the risk of abuse is very low indeed, a lot lower than other risks that we accept without thinking. Where there is a risk it comes overwhelmingly from men already close to the child: family members, friends, and so on. Not outsiders. But the adaptive unconscious is not very good with numbers.

Do all people feel that each of these moral values is equally important? Or do some values come out ahead of others? Haidt made the interesting discovery that in the USA, people think that some values are more important than others, but not everyone has the same ranking. Haidt found that there was a correspondence between people's political views and how they rank the different moral values. People who identified themselves as "liberal" or "progressive" gave much more importance to fairness/reciprocity and harm/care than to the other moral values.

Moving across the political spectrum, Haidt found that this relative importance gradually changes. With "conservatives," authority/respect rose to join fairness/reciprocity and harm/care at the very top, but ingroup/loyalty and sanctity/purity were also close behind. So when you are having a discussion with a "conservative," you can use all of the moral arguments with some success. On the other hand, "liberals" will usually only be persuaded by arguments based on fairness/reciprocity or harm/care. (Though they might still find honey disgusting.)

Although Haidt looked only at Americans, we might suppose that people in other parts of the world could be even further along this spectrum than the American conservatives. For example, from what little I know about life in the mountain villages of Afghanistan, I would say that authority/respect is their highest value, followed by sanctity/purity and ingroup/loyalty. The primary liberal values of fairness/reciprocity and harm/care seem to be relegated to last place.

Haidt's findings certainly explain the character of conservative and liberal political arguments, and particularly the way people on opposite sides can talk past each other, never really understanding the other side. But how do people come to prioritise their moral values this way in the first place? Perhaps the answer is the same as with emotions: although emotions are built-in and the same everywhere, there are socially-learned "display rules" about what emotions we can show and what we should hide. Display rules are learned in childhood and vary from culture to culture. Moral values are built in, but perhaps as children we learn which ones are important and which ones aren't.

This idea is supported by the findings of cognitive scientist George Lakoff. He also wanted to explain the different world views of liberals and conservatives. He realised that as a liberal, he couldn't understand the arguments of conservatives. Why did people at conservative political rallies cheer after particular lines in speeches? And why did they support clusters of apparently unrelated ideas — why were these people *against* gun control but *for* tort reform? He just didn't get it. He found this particularly embarrassing because as a linguist and a cognitive scientist it was his *job* to understand that kind of thing.

Lakoff eventually came up with an explanation. His theory is that we learn to express moral values differently based on our early experience in our families. According to Lakoff, our adult views on government and how we should organise our whole society are forged by the experience of "governance" that we see in

our childhood families. Lakoff describes two contrasting models of American family life: the conservative “strict father” model and the liberal “nurturing parent” model. This is how he caricatured the “strict father” model in a talk at Berkeley:

“The idea is this. You need a strict father in a family, assuming that there’s also a mother, for certain reasons: namely, there’s evil out there in the world and he’s got to protect the family from evil and mommy isn’t strong enough to do it. There’s competition in the world; he has to win those competitions, to support the family. Mommy can’t do that. And, kids are born *bad*. They’re born bad in the sense that they just do what they want to do — they don’t know right from wrong. They have to be taught right from wrong, and the assumption is, there’s only one way to teach them: punishment, when they do wrong. So if they’re punished when they do wrong, they will try to avoid the punishment, but because of that the punishment must be painful. The punishment must be painful enough that the kids will try to avoid doing wrong and do right, and that’s the *only* way people will ever become moral.”

You can see that Lakoff himself doesn’t think much of this way of raising children. But it’s undeniable that this way has been very popular throughout history, and is still very popular amongst the right-wing Christian fundamentalist part of American society. Today, an influential organisation called “Focus on the Family” promotes discipline by corporal punishment as a key practice in child rearing. The idea is that through discipline enforced by physical punishment, children will learn “right from wrong” and will grow into adults with self-discipline — self-reliant and successful. Lakoff rather pointedly explains the further assumption of this model that those people who are not able to be self-reliant — the poor — therefore have only themselves, or their parents, to blame. Their failure is explained by their lack of self-discipline. Success is regarded as the reward for being moral; failure is the punishment.

Lakoff describes his alternative “nurturing parent” model more sympathetically:

“You have two parents who are equally responsible. Their job is to nurture their children, and to raise their children to nurture others. (The second part’s very important.) What is nurturing? Two things: empathy and responsibility — for others and for themselves. For empathy, you have to know what all those cries mean. When your kid cries, you have to be able to tell what your kid needs. You have to be able to have a connection to your kids, so they can talk to you, tell you what’s wrong. In addition to that, you have responsibilities. You

have to take care of yourself — you can't take care of someone else if you're not taking care of yourself. But, you also have responsibilities to others. And you raise your children to both care about other people, be empathetic, and be responsible for themselves and responsible for others.”

From these descriptions, it seems obvious that the “nurturing” liberal parents are emphasising what we have been calling fairness/reciprocity and harm/care while down-playing the other moral values. In contrast, the “strict” conservative parents don't seem to be emphasising any particular moral value, except perhaps authority/respect. (Remember that corporal punishment generates fear, which I suggested was the emotion behind authority/respect.) So Lakoff's ideas mesh very well with Haidt's findings. Of course, these are very broad-brush models, and many questions remain. Two questions that immediately strike me are firstly, how much are these models really used nowadays in the USA? And secondly, is one model really any better than the other?

Lakoff points out that Americans live in a culture where everyone knows both of the models. People apply one model in some parts of their lives and the other model in other parts of their lives. For example, a nurturing liberal father might go out sailing with his family, and in that setting turn into an authoritarian martinet. The sea is dangerous, with injury and death always only moments away. To be safe, the crew of a boat have to obey orders immediately and without question. They have to trust the captain to look out for them, to keep the boat and crew safe. But back on shore, things can be quite different.

So people can and do use both models to some extent, depending on the particular group and the situation. But people have a preference, reflected in their political preference, and presumably learned in early childhood along with the “display rules” for expressing emotions. When we look at Americans and their political preferences, when exactly was that childhood? Most politicians are quite mature, maybe in their fifties or older. Older citizens certainly form the most active part of the electorate. When these people were being raised, in the 1960s or earlier, both of Lakoff's models were accurate descriptions of family life. Two parents, a mother and a father. The mother stayed at home and cared for the children. The father went out to a job and brought home a wage. Whether the model was “strict father” or “nurturing parents” it really was like that then. But it isn't like that now.

In the USA today, it is nearly impossible to maintain a middle-class lifestyle without two incomes. Both parents must go out to work. A mother today with a 6 month old child is more likely to go out to work than a mother with a 16 *year* old child was in the 1970s. So for modern children, a large part of their early care is in the hands of other people, usually groups of women. Add to this the fact that a large fraction of marriages end in divorce. Add also the fact that women of all but

the upper classes are enthusiastically abandoning marriage, and unmarried couples split up even more frequently than married couples. Many, perhaps most, children are being raised by an assortment of women with only minimal input from their fathers.

Despite the popularity of organisations like “Focus on the Family,” which encourage the “strict father” model, I find it hard to believe that this model is really being applied to modern children as often as it was 50 years ago. Is it even possible to live out the “strict father” model when the father is absent?

It appears to me that, placed in the hands of a sequence of women carers, today’s infants are more likely to see something like the “nurturing parents” model than the “strict father” model, but I fear that many children will see neither. In the past, children mostly had one closest carer in their early childhood. For most children this was their mother or maybe their grandmother; for the upper classes a long-term nanny. Nowadays it often isn’t any one person at all, but rather a series of day-care workers, too busy to give each child very much time or attention. What moral priorities are being learned here? What exactly is the new model of family life? This unusual experiment may, in fifty years time, have the effect of changing the political landscape of the USA. But should we worry? After all, is any model of family life fundamentally better than the others?

To explore that question further, we need to look more closely at a particular small fraction of the population. Yes, almost everyone has the emotions that I have described, almost everyone has the moral values. Recent research has shown that even infant children *do* have a moral sense, and can express it. For the most part, children *do* “know right from wrong,” and the models of family life merely set priorities, they do not install moral values from nothing. Almost everyone has built-in morals. But not absolutely everyone. We need to look more closely at psychopaths.

There are two small groups of people who are different emotionally from the rest of the population. Each group consists of around 1 in 100 people. If you don’t know the difference, you could easily be confused between them, because they have a superficial similarity: they can both appear to lack sympathy for other people. But they are fundamentally very different and you need to understand the difference. This is important because one group is mostly harmless, but the other is very dangerous. Before we look at the psychopaths, let’s take a brief detour and look at the mostly harmless group: people with autism or Asperger’s syndrome.

True autism is a disability, suffered by about 1 in 1000 people, but Asperger’s is much more widespread and not so much a disability as a difference. Autistic spectrum people find socialising difficult, because they find the rules of social behaviour hard to understand. Experiments with brain-scanners have shown that they don’t use the usual parts of their brains to recognise expressions. This explains a large part of their difficulty with other people: their adaptive unconscious

doesn't recognise other people's emotions. Although they have emotions *themselves* they don't intuitively recognise the emotions of others. From their point of view, it's as though ordinary people are mildly telepathic and can effortlessly read each other's minds, but they can't.

So, people with Asperger's find it hard to make small talk and can be rude without intending it. They have unusually strong, narrow interests and they can focus on these interests for very long periods. They like systems and rules. They are happy to tell you about their interests ad nauseam, and don't notice the look of boredom and irritation on your face. They are apt to take things literally, rather than getting an intended metaphor. They like to do things in a repetitive, inflexible way. They find it hard to make friends.

When you look at an Asperger's child you might notice that they have poor co-ordination, find it difficult to see where other people are pointing, or are prone to frustration and angry outbursts. (The number-one diagnostic check for Asperger's children is: do they ever point at things?) Many more boys than girls are diagnosed with Asperger's, but in part this is because the girls tend to show different symptoms: autistic spectrum girls, obsessed with systems and rules, tend to find rules governing food particularly attractive, and so they often suffer from anorexia. (And this is particularly difficult for them to get out of because starvation physically changes the brain — it makes people prone to focus on only one thing at a time and also reduces their ability to unconsciously read other people's minds.)

Clinical psychologist Simon Baron-Cohen thinks that around 1 in 300 people might be formally diagnosed with Asperger's syndrome, but there are many more who have some of the traits. (Like me.) He suggests that people from this autistic spectrum may have a form of "extreme male brain," since men in general are less empathic than women. Although there's a lot of overlap between the sexes, men are mostly better with activities that involve systems and rules; women are mostly better at reading other people's minds. Men can do it, they are just not so good. Autistic spectrum people are really bad at it. To get along socially they have to learn how to consciously read other people's expressions. This is hard work but better than being completely mystified in social situations. It should be no surprise that they are attracted to careers in maths, computing and engineering where interacting with people is less important.

So, although autistic spectrum people can come across as unsympathetic, they are emotionally just like regular people, which makes them mostly harmless. Psychopaths, on the other hand, can be poisonously dangerous. Their brains are also different from those of regular people, but this time the difference is that they don't seem to feel emotions. This is almost impossible to imagine, but it's been demonstrated to be true in experiment after experiment. Regular people have measurable physical reactions when presented with emotionally charged images and words. Psychopaths don't. Regular people anticipating a mild painful electric shock sweat

more in anticipation. Psychopaths don't. A psychopathic rapist explained his puzzlement about his victims: "They are frightened, right? But, you see, I don't really understand it. I've been frightened myself, and it wasn't unpleasant."

The term "psychopath" was coined at the end of the nineteenth century. (Up until then, the condition had gone under other names, such as "moral insanity.") Although the term caught on, and was joined by the synonym "sociopath" in the 1930s, it wasn't until psychologist Robert Hare created a diagnostic check-list in the 1980s that it took on an objective meaning. Hare's PCL-R check-list is still used in research, clinical diagnosis and prison parole decisions. A person's PCL-R score is based on interviews with psychologists, backed-up by documentary evidence. (The main fact to remember about psychopaths is that they are compulsive and talented liars, so you shouldn't believe anything they say unless you can verify it.) The maximum PCL-R score is 40 and a normal person scores around 5. A score of more than 30 earns a clinical diagnosis of psychopathy. Hare found that in the USA, about 1 in 5 prison inmates were clinical psychopaths, and that these were precisely the people most likely to re-offend when released — they caused over half of the violent crime. A study in 2000 found that the *average* PCL-R score for male prisoners in the USA was over 23.

But, as with autism, there's a spectrum. Hare suggests that there is a huge population of "subclinical" psychopaths outside prison, around 1 in 100 of the general population. These "successful psychopaths" are con-men, unscrupulous business men, white-collar criminals and so on. They will never be violent criminals, but they can still be dangerous. They can read other people's emotions perfectly well, even though their own are flat-line. They have no anxiety, so they are smooth and believable liars. When they are caught out in a lie they have no embarrassment, and can pick up again without losing a beat. If you wired them up to a "lie detector" they would pass, because a "lie detector" doesn't actually detect lies, it detects stress, and they are perfectly relaxed when they lie. Although they are unemotional, they can be talented actors and they do still have other physical urges, for example for sex. They are often thrill-seeking, with a pathological desire to win and an inclination to hurt people.

How can you spot them? It can be difficult. Very difficult. Perhaps their cold "goats" eyes might give them away, with their piercing stare, or (despite their glib, confident "gift of the gab") their careless use of language — confusing similar words, ploughing past inconsistencies. Maybe they need more "beats" of hand movement while talking about emotions, because that's like a foreign language to them. Perhaps if you are very empathic, or have learned what to look for, you might notice the wrongness of their micro-expressions even as they smile and reassure you. Or maybe not. Hare describes how he and all his fellow researchers get taken in from time to time, despite their years of experience.

However, with that huge disclaimer, here are some key indicators, taken from

Hare's books. Psychopaths tend to be:

- glib and superficial,
- egocentric and grandiose,
- lacking in remorse or guilt,
- lacking in empathy,
- deceitful and manipulative,
- emotionally shallow,
- impulsive, seeking excitement.

It's also a bad sign if they are unable to:

- share (information, credit, and so on),
- form a team,
- tell the truth (even when there's no reason to lie),
- be modest,
- accept blame (they will fabricate evidence to blame others),
- act predictably,
- react calmly and without aggression.

"Successful psychopaths," the ones who don't end up in prison, will not show all these indicators. In particular they may not seem irresponsible, impulsive or negligent. They may in fact appear competent and disciplined, striving for success. "Winning," however they define it, is their key aim. They can seem to quickly change their feelings about people, but this is because they never really had those feelings to start with, just strategies for getting what they wanted.

Psychopaths also tend to treat you differently depending the role you play in their schemes. They see some people as pawns to be manipulated, others as patrons to be flattered. Some are patsies to be exploited, others are regarded as "police," to be guarded against. Your view of a psychopath can be very different from someone else's: you might see them as an unreliable colleague, while your boss might see them as a trusted worker. You might be able to work out the truth by taking views from different places in a hierarchy, but it might be hard to convince anyone else.

How significant is the impact of psychopaths? Only a professional could offer a diagnosis of psychopathy, and when we look at stories from history we are not likely to have the benefit of such a professional opinion. Probably the best we can do is to keep our checklist at hand when we read stories from history and try to make our own minds up. For example, here's a recent story from journalists John Goetz and Bob Drogin about an Iraqi code-named "Curveball." See what you think.

Rafid Ahmed Alwan arrived in Germany in late 1999. He applied for political asylum at Zirndorf, a refugee camp near Nuremberg. The BND, Germany's intelligence service, learnt that he had helped to run a secret Iraqi biological weapons programme. Over the course of the next 18 months Alwan provided sketches and details of the mobile germ labs that he had built to grow anthrax and other bio-weapons. A BND officer noted that "He was understated. He was the opposite of a braggart, and that was impressive." In the USA, the CIA embraced the revelations of this defector whom they codenamed "Curveball," and in his 2003 State of the Union speech, President Bush declared that he was certain that Iraq had mobile germ factories. Colin Powell showed diagrams based on Alwan's eyewitness sketches to the UN Security Council when he made his case for the war on Iraq.

In 2004, a year after the invasion of Iraq, the CIA concluded that Iraq had abandoned its chemical, biological and nuclear weapons programs after the 1991 Gulf War. The CIA declared that Alwan was a liar. The mobile germ factories had never existed. What happened?

Alwan had studied chemical engineering at university in Baghdad. He graduated in 1990 with a poor grade — his best subject was the "culture and history of Iraq"— but in 1994 he got a job as site engineer at Djerf Nudaf, a warehouse complex 10 miles from Baghdad. His boss, Hilal Freah, was a friend of Alwan's mother. Freah later recounted how "Rafid told five or 10 stories every day. I'd ask 'Where have you been?' And he'd say 'I had a problem with my car.' Or: 'My family was sick' But I knew he was lying." Freah said he had a gift for it, and was unembarrassed when caught in a lie. Freah sacked him in 1995 for stealing.

Despite this, Freah and two friends then joined Alwan in a business to sell locally made shampoo. Alwan overcharged his partners for the shampoo bottles and the business collapsed. Alwan's mother paid her son's debts. Alwan next moved into cosmetics, but this business failed amidst allegations that he had cheated his suppliers. Finally he worked as a technician at Babel, a film and TV company in Baghdad. Alwan fled the country in August 1998, just ahead of an arrest warrant which accused him of stealing camera lenses and selling them on the black market.

And so, he eventually came to be in Germany, a "refugee." While he was telling lies to the BND, he divorced the wife he had left behind in Iraq and married a Moroccan woman. He got a job at a local Burger King, where he told his co-workers that he worked for Iraqi intelligence. Alwan told the BND that he had

worked for Freaah until shortly before he fled in 1998, and that some of the sheds on the warehouse site were used for bio-weapons production. Western intelligence agents checked out the story in 2002, before the war. Locals denied the allegations. They said those sheds were used for fumigating agricultural seeds to prevent mould. The agents found Alwan's version more believable. Journalists Goetz and Drogin wrote in 2008 that Alwan's "reputation as a disinformation agent remains intact." What do you think?

So, after that long detour, let's come back to the question that I left hanging earlier in this chapter: is one model of family life better than the others? Despite being more inclined to the "nurturing parents" model myself, I thought for a long time that the "strict father" model might be better at preventing children with psychopathic tendencies growing up to be serial-killers. If so, it would be the best default model for society to apply, more reliable. But now I'm not so sure.

It's certainly the case that attempting to nurture adult psychopaths has no effect. For liberals, it's a bitter pill to swallow, but unfortunately there are some people who simply cannot be redeemed. The "strict father" model acknowledges that "there is evil in the world." For children who genuinely "don't know right from wrong" it seems plausible that the "strict father" model could instill in them the habit of following society's rules even without moral feelings to guide them. Maybe it might work to teach them right from wrong by punishing them when they do wrong.

That seems plausible, but now — because of the work and example of neuroscientist James Fallon — I'm not so sure. Maybe the "nurturing parents" model is best after all. Maybe it depends exactly what we mean by "nurturing." What exactly makes a psychopath in the first place? Are they always bad from birth? And if not, what makes the difference? Fallon's research is finally throwing some light on those questions.

Studying the genetics, brain-scans and case histories of psychopaths, Fallon discovered three separate ingredients which must be present for someone to end up as a full-blown psychopath. First, they must have enough genetic traits which predispose them to violence, aggression and risk-taking. We now know of over a dozen of these traits and to be a psychopath an individual would need to have many if not all of these traits.

Second, an individual must have a loss of brain function in the orbital cortex, just above the eyes. This is the area of the brain which is responsible for decisions which we would call "conscience" or "impulse control." This brain damage might be caused before or after birth, and it might be caused by developmental problems due to genetics, or by their environment. Comparing the brain-scans of serial-killers to those of normal people, Fallon found that the psychopaths had a wide variety of brain damage, but invariably they all had a loss of function in this key area.

The third necessary ingredient is childhood abuse — being involved in some extreme violence at an early age. This might be sexual abuse, it might be family violence, it might be a war rolling through a previously idyllic childhood. But it has to be really traumatic, “not a little stress,” says Fallon, “like being spanked or something.” Exactly when in childhood the violence happens seems to influence what kind of adult psychopath the child grows into.

But what makes James Fallon uniquely informative is that he himself *has the first two ingredients*. And yet he is not — quite — a psychopath. As he rather poignantly says in an interview:

“I’m right at the edge! But I’m not there — I’ve never been a criminal, never been in jail, and I’m generally considered a nice guy. But there are some deep flaws and I have a lot of flat affect. I don’t really care about people, frankly, especially if they are close to me. I care about people generally, society in general, but you don’t want to be married to me or be my mother. I’m kind of a disappointing person to be close to.”

Fallon’s path to self-discovery started when he had his own brain scanned as part of an unrelated experiment and was surprised to find that his scan was identical to the serial-killers. “What was disturbing,” says Fallon, “was no activity in those areas of the brain that process pleasure, ethics, morality, social interactions — there was nothing there.” But, as Fallon points out, a brain-scan can’t tell you that someone is certainly a psychopath. It can tell you that it’s *consistent* with being a psychopath, but it’s also consistent with being a hyper-maniac or bon-vivant. “And I’m certainly that,” says Fallon.

As part of a different experiment, Fallon also had his genes checked for a range of genetic traits, and to his surprise discovered that he had all 15 of the known genes for behavioural problems. The geneticists said that they had never seen so many high-risk genes in one person. Around the same time, Fallon also discovered an unusually large number of murderers amongst his ancestors: not only was he related to axe-murderer Lizzie Borden, but on his father’s side there were eight other known murderers, going back to the first recorded killing of a mother by her son in the American colonies. Which makes us all want to ask the question posed by an interviewer: “How come you are not in prison yourself?”

Fallon previously thought that genetics would mostly determine behaviour, but in his case it obviously hadn’t worked out that way. He describes how he had a very nurturing, positive childhood, where he was “really taken care of and loved a lot.” He says that “all this love and protection and nurturing must have somehow offset those genes.” We know that abuse can crystallise incipient psychopathy, and maybe Fallon is right that the reverse is also true: that a loving, nurturing

childhood could be protective. (Of course, there's no reason to suppose that it would always make a difference.)

So, as far as achieving the best outcome for incipient psychopaths, which is better: the "strict father" model or the "nurturing parents" model? One example, even an extraordinary example like Fallon, is not enough evidence to settle the matter either way, but it is enough to make me doubt that the "strict father" model has more going for it. Provided that children are protected from abuse and violence, maybe it doesn't matter whether the model is "strict father" or "nurturing parents."

However, what about the new "day-care" model which many parents are forced to apply these days? I'm less optimistic that this will work out well in the end. There just isn't enough love and attention to go around. Will the potential psychopaths amongst these children be able to reflect in later life that they were "really taken care of and loved a lot"? Or will they be in prison?

Once adults *are* psychopaths there is no evidence that they will ever "get better," and nurturing them with that hope appears to be a waste of time, even counter-productive. Modern treatment programs for psychopaths in prison apply something like the "strict father" model, reminding prisoners that they are being punished for their own actions, and if they don't want to go back to jail they will have to act differently in future. It seems to work, to change their behaviour, at least to some extent. If psychopaths make it into their 40s without turning into serial-killers, the danger seems to recede. They may be unpleasant in various ways, but they can also be productive and not generally dangerous.

But outside of prison treatment programmes, the "nurturing parent" model may ultimately be a stronger and more effective defence for the rest of society, if it leads people to resist the psychopaths who inevitably make it into positions of power. Psychopaths have many of the qualities valued in a leader. They are confident, full of themselves, dominant and assertive. Although psychopaths can't easily form a team, they can easily manipulate people into following them. In the face of crisis they are always calm. To be promoted, often all you need is to look busy and to have good hair and teeth. Psychopaths are masters at claiming success for themselves while dumping the blame for failure on others. So of course they will win their way to the higher reaches of companies and government. Winning is what they live for. Although the figure of 1 in 10 is disputed, there seems to be broad agreement amongst psychologists that psychopaths are over-represented in the upper ranks of corporations and government. This is not good news.

When the authority figure in a "strict father" government is a psychopath, it starts to look an awful lot like Stalinist Russia. (Don't be fooled into thinking the USSR was a "nurturing parent" country just because it called itself "Communist.") The "strict father" model relies ultimately on the father figure being trustworthy, and if he isn't there is no other defence. The model just implodes. On the domestic

level we are left with a superficially respectable family where the husband beats his wife and abuses their children, propagating this pattern into the next generation. On the level of government we are left with corrupt communism and crony capitalism. At least in the “nurturing parent” model, everyone sees it as their duty to look out for other people, to see that justice is done, to resist the tyrant, even at great personal cost. There’s a time to follow and a time to strike. You don’t have a duty to support a tyrant who abuses your trust, you have a duty to foment rebellion.

The most important thing is to judge people on what they actually do. Not what they say, not what they promise. What they do. We need to see the truth and act on it. Which brings us to the subject of the next chapter: truth.

Chapter 3

Truth

In the opening pages of the Sherlock Holmes story *Silver Blaze* we find Holmes and Watson on the train from Paddington to Exeter. They are on their way to Dartmoor, to investigate the disappearance of the racehorse Silver Blaze and the murder of his trainer John Straker. It is summer 1892, and when we pause to think, the story contains small oddments of information which are quite strange to modern eyes. For instance, *everyone* smokes — we are told that Holmes spent the previous day pacing back and forth while smoking pipe after pipe of “the strongest black tobacco.”

Holmes and Watson also demonstrate that the late-Victorian gentleman expected to be able to travel with a speed which we would today consider unlikely. In the previous hour or so, they finished their breakfast, took a cab from Baker Street to Paddington Station, bought tickets, bought newspapers and left London on a Great Western Railway train. Installed in their first class compartment they watched the smoke and brick of the city fall behind them, crossed the Thames on Brunel’s magnificent bridge at Maidenhead, and are now well beyond Reading. An hour or so. Impressive.

Holmes finishes reading the newspapers and offers a cigar to Watson. (More tobacco. See what I mean?) Holmes looks at his watch. “We are going well,” he says. “Our present rate is fifty-three and a half miles an hour.” How does he know? Could you do that?

Perhaps your watch has a GPS receiver and tells you your speed, but this is 1892. Holmes’ watch is clockwork, with a gold case and, like all gentlemen, he keeps it in his waistcoat pocket on the end of a gold chain. Of course, Holmes and Watson both know useful little pieces of information about their own era, things that you might not know. For instance, they know that the railway lines have posts every quarter of a mile, near the track. If you put your head close to the window you can see them as they pass by and you can use your watch to time the seconds between them. At your speed it takes 67 seconds to travel a whole mile. Then, since you are a hacker, you know there are 3,600 seconds in an hour and you can do in your head the long division sum 3,600 divided by 67. You get the answer $53\frac{1}{2}$ miles an hour.

Watson is unimpressed. He just says “I have not observed the quarter-mile posts.” He’s telling Holmes that if he had to, he could do the sum too. It’s just

schoolboy arithmetic.

But Watson has fallen for Holmes' gambit. "Nor have I," says Holmes, about to flaunt his knowledge of arcane trivia. "But the telegraph posts upon this line are sixty yards apart, and the calculation is a simple one."

Watson is happy to let Holmes have his little victory. It seems very plausible. But when his conclusions are more unexpected or where there is more at stake, Holmes has to work a lot harder to convince Watson. Exactly how does he do it? We will leave Holmes and Watson on the train for now, but we'll rejoin them later, when they reach the King's Pyland stables on Dartmoor. In the meantime, I want to explore how the different kinds of logical argument used by Holmes actually work.

Nowadays, in the era of Post-Modernism, there is a popular idea that everything is just opinion and that one person's opinion is as good as anyone else's. That nothing is really true. That everything is relative. Holmes and Watson are not Post-Modernists. They are children of the Enlightenment — they believe that there is a truth, and they can find it out and reveal it to others. Their tool for doing this is logical argument.

Logical arguments are very different from moral arguments. To be convincing with a moral argument you need to evoke an unconscious emotional response. With a logical argument on the other hand, you need to get someone to consciously agree on facts, and then to explain to them how these facts lead inevitably, step by step, to your conclusions. As we have seen, the adaptive unconscious is rather good at snap decisions, but tends to jump to conclusions and to be very inflexible in the face of new evidence. Logical arguments are valuable because we can use them to consciously over-ride these unconscious judgements. We can change our minds when we are wrong. This can feel very uncomfortable, but it is better to be uncomfortable and right than to be comfortable and wrong.

Let's begin with facts, the basic atoms of logical argument. When someone tells you a "fact," how do you decide if it is true? When we first hear or see something new, it appears that our immediate reaction is to just believe it. Disbelief, if it happens at all, comes at least a moment later. To disbelieve something that we are told, or that we think we saw, takes an effort — psychologists would say that it imposes a "cognitive load." This effort is harder if we are tired, distracted or under time pressure.

On the other hand, disbelief is easier if the new "fact" contradicts something we already believe to be true. This is because contradiction imposes its own "cognitive load." It's very uncomfortable to try to hold two contradictory things in mind at the same time, to hear one thing and believe another or to do one thing and believe another. In the 1950s, psychologist Leon Festinger coined the term "cognitive dissonance" for this effect. We unconsciously act to reduce this uncomfortable feeling, usually by passively ignoring the new thing, sometimes by more actively

avoiding or denying it.

This effect is essentially the same as what more recent psychologists have called “confirmation bias.” People tend to seek out new information confirming what they already believe and they avoid information which contradicts it. Whatever we call this effect, it means that we are apt to ignore inconvenient facts if we don’t deliberately stop to consider them.

“Facts” that we tentatively accept become more and more believable as we hear them again and again, even when they come repeatedly from the same source. This is because our adaptive unconscious seems to use a rule of thumb that when something is easy to recall, then it must be true. Psychologists call this the “availability heuristic.” So events described in vivid detail seem more plausible, the risks of gruesome accidents seem more likely. And bizarrely, denials can make something seem more believable, because the idea being denied is made more memorable by the denial, while the “not” in the denial fades out after a few days. So if you say, “This man is not a thief,” after a few days, people will tend to remember the opposite.

With conscious effort, we can examine apparent facts more closely and decide rationally whether to accept them or not. The first step of course is to use your conscious mind and not just leave the job to your adaptive unconscious. Stop and think! When you look at it more carefully, you will often find that the “fact” you are being handed isn’t actually a fact at all. Perhaps it is really just an opinion, a rumour, a speculation or a lie.

If we think that a “fact” may be true, but we are not sure, we tend to rely on the respectability or authority of whoever gives it to us. Holmes tells Watson that the telegraph posts on the Great Western Railway are 60 yards apart. Now, Holmes often keeps information to himself, but he doesn’t often lie to Watson directly, particularly about such trivial matters. Watson is happy to take this information on trust. If more was at stake, Watson might want to check how Holmes came to know it — does he have a plausible story? Can he show some document that confirms it? What would be enough to prove it in a court of law? If Watson wanted to be really sure, he might decide to take a tape-measure, walk the line and measure the spacing for himself.

If we can’t go back and measure something for ourselves, if we have to rely on reports from witnesses, then we need to appreciate just how unreliable witnesses can be, and the sort of mistakes they tend to make. People are surprisingly poor at seeing what really happened and even worse at remembering it. Of course, they can do much better if they are prepared and paying attention, especially if they are experts with a lot of experience in what they are watching. But otherwise people are quite easy to fool. We tend to see things and remember things that didn’t quite happen.

We can fool ourselves quite innocently and we can also be fooled deliberately

by other people. Neuroscientist Michael Gazzaniga recounts an especially impressive example, a trick performed by stage magician Harry Blackstone:

Standing beside a large top hat, Blackstone would tip it up and show the audience there was nothing under it, replace it, switch his attention and that of the audience to his beautiful assistant standing on his right, pull parts of a sheet out of a container, and hand them to his assistant, one wad after another. After a minute or so he would pick up a sheet with great gusto, turn to his left, and throw it down over the large hat that had been there all the while. The crowd was ready. What could be the trick? Blackstone then whipped the sheet and hat back, and there was a full-sized donkey—not a rabbit or a chicken, a damn big donkey. Unbelievable.

Even other stage magicians couldn't work out how he did it. (It was all distraction: while Blackstone and the beautiful assistant were keeping the audience's attention with the sheet exchange, a second assistant simply walked on stage with the donkey, placed the hat on it and walked off again. Even though everyone in the audience *saw* the second assistant with the donkey, they didn't notice him at the time or remember him later. He was too uninteresting. Blackstone then simply turned and threw a sheet over the hat and the donkey. When he whipped the sheet and hat away, there was the donkey! The fact that the trick was called "Out of Your Hat" was a further piece of misdirection.)

In recent years, psychologists have demonstrated scientifically what stage magicians always knew: we only *consciously* notice the things that we *unconsciously* consider salient. If you are an expert in what you are seeing, you unconsciously notice more details, so you have a better chance at registering what really happened, but even experts can be deceived. Even other stage magicians couldn't work out Blackstone's trick. If you are not an expert and you are not prepared, you can be deceived even by events that you might think would be transparently clear. You can easily miss a fight by the side of the road. You can even miss someone standing in full view wearing a gorilla costume. (Both of these mistakes have been demonstrated in modern experiments.)

Since we miss so much of what happens around us, it's unsurprising that witnesses to an event tell different stories about what they saw. Even worse, people's adaptive unconscious actually fills in the details that are missing. People can be absolutely convinced that the details they have invented are quite real. Gazzaniga describes an experiment by psychologist Michael Miller:

He asks subjects to study pictures of strongly thematic scenes, for example, a stereotypical beach scene with lots of activity. Later, when he asks subjects if they remember seeing a beach ball, they likely will say

yes even though there was no beach ball. Furthermore, when Miller probes subjects for their specific recollections of the beach ball, they go into a very elaborate description, such as seeing boys tossing a beach ball with red and green stripes.

The detail that people recall seems convincing to us, and it's more than convincing to them — *it's what they remember*. But it can still be false. Perhaps even more disturbingly, recent research by neuroscientist Karim Nader suggests that the old theory of “memory reconsolidation” may be correct after all. In this theory, memories are not fixed things, like images on a film, but very fluid and changeable. Like unpacking and repacking a suitcase, every time we recall something, we re-remember it afterwards, and it's not necessarily the same as it was before.

It's certainly the case that questions from others can prompt memories of things that didn't really happen, and that these memories can become more and more embroidered over time. Witnesses repeating a story can slowly change it, incorporating elements they only found out later, and which may not be correct. Because of this, it is important to get witness statements as soon as possible after an event, and to give more weight to the earliest statements. Subsequent re-tellings are intrinsically less credible, especially if months or years have gone by.

However, when we know about these effects, we can actually use them to our advantage when we interpret accounts from several witnesses. If the general outlines of a story are supported by many witnesses who disagree about details, we can still be confident that the general outline is correct. If a specific detail appears in many accounts which differ in other details, we can still be confident that the specific detail is correct. But if a group of witnesses tell practically the same story, with all details the same, then all we can really be sure of is that their story is to some extent a lie. The only way that many accounts could be identical is if they had been invented, if the witnesses had agreed beforehand on what to say, or been told.

Now that we have learned to be suspicious even of evidence we see with our own eyes, let's move on from “facts,” the atoms of logical argument, to look at “reasons” and “conclusions,” out of which we can build complex molecules of rational thought. For literally thousands of years, children who had a classical education learned about logic in school. These children were always a small fraction of the population. (Holmes and Watson, being gentlemen, would of course have been amongst their number.) Even today, with mass education, only a small fraction of children are taught this material. Perhaps a mental tool that lets you think more clearly is too sharp to put in the hands of just anyone. Who knows what the consequences might be? But you need to know this, and since the odds are that you don't already know it, I'll attempt now to give you a crash course. If it seems a little dry, remember: it really is valuable, and we'll get back to Holmes and Watson on Dartmoor quite soon.

Where to start? Well, I guarantee that all medieval school children learning about classical logic would be familiar with this illustrative example:

Socrates is a man. All men are mortal. Therefore, Socrates is mortal.

This example of logic from the ancient world seems both trite and obvious, but let's use it the way a medieval schoolteacher would, to illustrate the parts of a logical argument:

<i>Socrates is a man.</i>	(fact)
<i>All men are mortal.</i>	(general rule)
<i>Therefore, Socrates is mortal.</i>	(conclusion)

The first line is a **fact**. You know all about them. They can be true or false, and you have to make your own mind up about each fact you meet. The second line is a **general rule**. Like a fact, it can also be true or false, and again you need to make your own mind up. Unlike a fact, which is about a particular thing, a general rule is about groups of things. It's as though the general rule has a hole in it into which we can fit a particular fact, like slotting a shape into a child's puzzle. The fact has to have the right shape. In this case the general rule is about *all men*. Since the previous fact tells us that Socrates is *a man*, the hole in the general rule is the right shape, and we can slot the fact in. The specific fact about Socrates and the general rule about *all men* can now be combined to give a specific new fact about Socrates. This is the third line, the **conclusion**, which is a new fact derived solely from the first fact and the general rule, which we call the **reasons** for the conclusion.

Now, you might object that the conclusion is entirely obvious, that you already knew that. But notice that to reach the conclusion, we didn't use any extra "common sense" knowledge. We only used what was explicitly stated in the reasons. This is the key to the method of logical argument: if we want to convince someone of the conclusion in a more complex argument, all we have to do is to convince them of each of the reasons in turn. When we have done that we can combine the facts and general rules in a purely mechanical way and the conclusion is inevitable. Or if we are uncertain about our own conclusion, we can go back and check our reasons one by one. Are all the facts and all the general rules really true? Do they fit together properly? If so, then despite our misgivings, the conclusion must be true too.

We can also work the method backwards: if we are certain that the conclusion is wrong, then it must be because one of the reasons is wrong, or because we have fitted them together wrongly. The conclusion doesn't depend on anything else. If we go through the reasons carefully, we can find our mistake and correct our thinking. Or if someone else is trying to convince us of a conclusion and we don't

agree with it, perhaps we can go through their reasons one by one and show them their mistake. If we can't find their mistake, then in fact they are correct, and we should believe their conclusion. Maybe we will find that we cannot agree on one particular reason: one of us thinks it's true, the other thinks it's false. However the conversation goes, logical argument helps us to understand each other better and to communicate what we understand.

Let's go back to Socrates, and see how we might write the same argument in different ways. For example, the linking words might be different:

Socrates is a man and (fact)
all men are mortal, so (general rule)
Socrates is mortal. (conclusion)

Or the conclusion might come first:

Socrates is mortal because (conclusion)
all men are mortal and (general rule)
Socrates is a man. (fact)

Or the conclusion might be in the middle:

All men are mortal, so (general rule)
Socrates is mortal because (conclusion)
Socrates is a man. (fact)

People usually signal that they are using a logical argument by using joining words like "so," "because," "therefore" and so on. When you read or hear a logical argument, your first task is therefore to work out exactly what the conclusion is, and then to work out what are the reasons supporting it. Are the reasons actually true? Do the facts really fit properly into the general rules, and if they do fit, do you actually get the stated conclusion?

It's important to realise that the reasons people present for their conclusions can be wrong. Whether they are facts or general rules they can still be wrong. However, the word "because" has an almost magical effect on people. This is presumably due to the effect I mentioned earlier, where we initially believe what we are told and have to expend mental effort to disbelieve it. When you use the word "because," people tend to believe that the following reason really is a valid reason, particularly when they are short of time or there isn't much at stake.

For example, say that two cabs are coming down Baker Street, and Holmes hails the first one at the same time as another gentleman. Who gets that first cab?, If Holmes says to the other gentleman "Do you mind? I need this cab," the other gentleman is unlikely to be impressed. We would expect some further discussion.

However, if Holmes says “Do you mind? I need this cab **because** I have to get to Paddington Station,” the other gentleman is likely to give way quite meekly and take the second cab. Holmes hasn’t really given a convincing reason: obviously he had to get to somewhere, otherwise he wouldn’t have hailed a cab. But such is the power of “because,” that even when the reason offered is completely bogus, it’s quite convincing. Be careful if someone hands you a cheeky “because” like this. Take another look.

When we take a closer look at more proper arguments, they can also be wrong, but for more complex reasons. Let’s have a look at some simple examples of logical argument—can you label the parts? And when you check the argument, does it work?

Holmes is a detective and detectives catch criminals, so Holmes catches criminals.

The phrase “detectives catch criminals” is short for “all detectives catch criminals.” In this case the reasons are true, and they lead to the conclusion.

Watson lives in London, and London is in England, so Watson lives in England.

The phrase “London is in England” is short for “all things that are in London are also in England.” Again, the reasons are true, and they lead to the conclusion.

Watson is a doctor, and Silver Blaze is a horse, so Holmes is going to Dartmoor.

The conclusion “Holmes is going to Dartmoor,” though true, is not supported by the reasons: we have two facts, not a fact and a general rule. They are the wrong reasons for this conclusion, even though they are both true. They don’t combine to produce the conclusion, so the argument is false, even though the conclusion happens to be true.

Watson is an author, and authors like cheese, so Watson likes cheese.

The phrase “authors like cheese” is short for “all authors like cheese.” This is a general rule which is false. Not all authors like cheese. Some do, perhaps most, but not all. The conclusion might be true or false: Watson may or may not like cheese. I’m not sure. Either way, the argument is wrong because the reasons don’t support the conclusion. (Even if we had said “some authors like cheese,” which would be true, the conclusion would still be false: we could only conclude that Watson *might* like cheese.)

Watson is a doctor, and authors write stories, so Watson writes stories.

The conclusion is true, but it is not supported by the reasons. We have a fact and a general rule, but the fact doesn't fit into the "hole" in the general rule. The general rule concerns authors, but the fact is not about authors. Again, we have the wrong reasons for the conclusion, so the argument is false even though the conclusion happens to be true.

Of course, these are very simple arguments. Real arguments have more facts and more general rules, but they slot together in just the same sort of way. For example we could have the following argument regarding when Holmes and Watson's train can leave Paddington Station:

*The train can leave only if the engine is ready
and the driver is allowed to start.* (general rule)

*The engine is ready when it has enough coal
and water for the journey and steam is up.* (general rule)
The engine has enough coal for the journey. (fact)
The engine has enough water for the journey. (fact)
The engine has steam up. (fact)

*The driver is allowed to start when the signal is set to "proceed"
and the guard blows his whistle.* (general rule)
The signal is set to "proceed." (fact)
The guard has blown his whistle. (fact)

Therefore, the train can leave. (conclusion)

We can slot each fact into a hole in a general rule, but this time each general rule has several holes to fill before it disgorges its conclusion. We need the fact "the engine is ready" to slot into the first general rule, but we can only get that by making it as a conclusion using the second general rule and some more facts. It is in the nature of more complex arguments that some intermediate facts, like "the engine is ready," are derived as conclusions from other general rules.

Provided that the structure of the argument is correct, provided all the facts and general rules slot together correctly, then we can also use an argument like this as a *plan* to make the train leave. What do we have to do? Does the engine have enough coal? Check. Does it have enough water? Check. Does it have steam up? Check. And so on: if we can make all the facts come true, then we can make the conclusion come true.

On the other hand, if we observe that the train has not left and want to know why, we can play detective, and work backwards. Is the signal set to "proceed"?

Yes. Has the guard blown his whistle? Yes. Then the driver is allowed to start, so the problem must be that the engine is not ready. Why is that? We can work our way further backwards, eliminating reasons and eventually we will find the false “fact” which is the reason for our delayed departure. (This process is called “debugging” by computer hackers and “detection” by Holmes.)

Another way we can use an argument like this is as an **explanation**. With an explanation, we accept that the conclusion is obviously true. For example, when the train has actually left the station, and the platform is empty, the conclusion is certainly true. With an explanation we are looking for causes; we want to know *why* it happened.

However, when we try to use a complex argument in any of these ways, as a plan to make something happen, for debugging what went wrong or as an explanation why something happened, we find that we have an unpleasant problem: **hidden assumptions**. What if we had a failure of imagination, and we left out some vital condition from one of the general rules? For example, what if the driver is in the canteen, still drinking his cup of tea? The train couldn’t leave yet, could it? We should really have had an extra condition before we said that the engine was ready, something like “the driver is in the engine.” Then we could check that was true too. But in practice, however complete we try to be, there will always be something else that could go wrong. What if the driver was in the engine, but he was hit by a meteor? Should we put that in as a extra condition? No! We have to draw the line somewhere, and only choose general rules which are practically relevant. But clearly, this is a matter of judgement, and we might disagree about particular choices.

All of the examples we have seen so far are what the medieval school teacher would have called “syllogisms” — we are presented with all the general rules and all the facts needed to form the conclusion. We don’t need to bring any commonsense knowledge, everything we need is there already. But in practice when we use logical arguments, we tend to be not quite so thorough. We tend to leave unsaid some things that we rely on. For example:

Socrates is a man, so (fact)
Socrates is mortal. (conclusion)

The medieval school teacher would call this an “enthymeme” (pronounced “enth-i-mee-m”). It’s a syllogism with some of the reasons missing. In this case the general rule is left out, and the reader has to use their stock of commonsense knowledge — they have to supply a general rule which bridges the gap. In practice most real logical arguments are like this. We usually don’t supply all the necessary reasons. Our listeners would be dreadfully bored and cut us off, saying “Yes, I see what you mean.” So we leave out lots of facts and general rules that we take for granted as commonsense knowledge. We call these missing reasons **assumptions**.

Notice that they are not quite as invisible as the previously mentioned **hidden assumptions**, because as we try to follow the reasons in an enthymeme and form the conclusion for ourselves, we will find that one of the reasons we need is missing. You don't need imagination to notice the missing reason, just diligence. Still, some people use arguments with such a host of missing reasons that some of their assumptions are actually quite well disguised: it's a lot of effort to work them all out explicitly. (But this is exactly the kind of argument where it really is worth the effort, since the weak point in their argument is most likely in some assumption that they have swept under the carpet.)

We are now nearly finished with the lightning course on logical argument, but before we can rejoin Holmes and Watson (currently travelling on another train from Exeter to Tavistock) we need to look a bit more closely at general rules and introduce **hypothetical facts**.

We have seen general rules like "all men are mortal" and like "if the engine is ready then the train can leave." At first sight these seem quite different in nature. But behind the scenes they are really very similar when we re-phrase them in terms of hypothetical facts, things that we explicitly *suppose* to be true, without concerning ourselves yet whether they really are. For example, all these general rules really say the same thing:

All men are mortal.

Suppose someone is a man, then they are mortal.

If someone is a man, they are mortal.

All general rules implicitly have this kind of "suppose" inside them, which is why only some facts will slot into the "hole" in the general rule. The hypothetical fact and the actual fact need to match up in their properties or we can't replace one with the other.

We can also invent our own **hypothetical facts** and put them into an argument. Sometimes we do this because we don't think it matters whether a particular fact is true or not, and we think we can prove our conclusion either way. In that case, to avoid getting bogged down in a futile quarrel about whether or not that fact is true, we can let our opponent have it their way "**for the sake of argument**" and show them that we can prove our conclusion regardless. When we suppose a fact to be true for the sake of argument we are not admitting that it is true, we are saying "look, even if you were right about that, it doesn't make any difference to the conclusion."

Sometimes we might invent a hypothetical fact and put it into an argument so that we can make a new general rule as a conclusion. For example, suppose Watson wanted to buy a pork-pie while they changed trains on Exeter station. Could he do it?

*Watson can buy an pork-pie at Exeter if the shop sells pork-pies
and he has time between connections.* (general rule)
The shop sells pork-pies. (fact)

We don't have enough facts to fill in the two slots in the general rule. We only have one fact, so we can't make any progress. Let's invent a hypothetical fact, which can fill that other slot:

Suppose Watson has time between connections. (hypothetical fact)
*Therefore: Supposing Watson has time between connections,
he can buy a pork-pie at Exeter.* (general rule)

In this case we don't say that Watson definitely has time between connections, we just *suppose* it is true. Fitting the reasons together as before we end up with a new general rule, which includes our hypothetical fact as a condition. The fact which we knew to be true — that the shop does sell pork-pies — has disappeared from sight. The final conclusion could be rephrased as:

Watson can buy a pork-pie at Exeter if he has time between connections.

Lastly, we might invent a hypothetical fact because we want to *disprove* it. This is known as "**proof by contradiction**," but our medieval school teacher would probably call it "reductio ad absurdum." If we suppose something to be true, and with other reasons we can reach a conclusion which we know to be false, then something about our argument must be wrong. If the other reasons are true and the argument is constructed properly, then the only possibility is that our hypothetical fact is false. By assuming that something is true, we prove that it's false. This is a strange, but perfectly respectable technique. We'll see a great example of this shortly, when Holmes and Watson inspect the scene of the crime on Dartmoor. Let's return to them now.

Holmes and Watson arrive at King's Pyland in the early evening sunlight. Inspector Gregory and Colonel Ross, the owner of Silver Blaze, greeted them a few minutes ago at the railway station in Tavistock. The steeples of Tavistock are now just visible over the faded brown curves of the landscape. The moor stretches out in all directions from the isolated house and stables. Colonel Ross's landau (a kind of open-top horse-drawn carriage) stops and they all get out. Except for Holmes, who is lost in thought, mulling over what they discussed on the way from the station. Watson has to prod him. Colonel Ross is already leaning towards the conclusion that Holmes is a bit of a nutter.

The only suspect for the murder is Fitzroy Simpson, a somewhat disreputable thirty-something gentleman who makes a living as a bookmaker, taking bets at London clubs on the results of horse races. Two days ago, on the night of the crime, he appeared out of the rain and darkness about 9 p.m., just as the maid

from the house was taking a mutton curry supper to Ned Hunter, the stable-boy keeping watch over Silver Blaze. At first Simpson claimed to be lost, then he tried to offer money for racing tips. The maid ran back to the house, but the stable-boy came out with the dog to chase him off. By the time he had unlocked the door and locked it again behind him, Simpson had gone.

After this disturbance, the stables were locked up again for the night. Ned Hunter was on watch downstairs with the horses. The two other stable-boys, who were eating their supper at the trainer's house when Simpson appeared, went to sleep upstairs in the loft over the harness-room. Later that night, the trainer John Straker and his wife woke, rain still pattering on the windows. Straker had a bad feeling and told his wife he was going out to check on the horses.

In the morning, the rain had gone and so had Silver Blaze. The stable door was wide open and Ned Hunter, who should have been on watch, was found asleep in a chair. So deeply asleep that no-one could wake him. Drugged. Straker was found clubbed to death in a hollow on the moor about a quarter of a mile away. Simpson's cravat was on the ground nearby.

That was yesterday. The police quickly tracked down Simpson and arrested him. When they tested the remains of the mutton curry they found traces of opium. Hunter the stable-boy swore that Simpson had slipped it into his food when the maid was passing it in through the stable window. But considering the story again this evening, Holmes is not convinced.

Inspector Gregory thinks they can make a case against Simpson, but he isn't entirely convinced either. Gregory takes Holmes from the house to the stable and then to the hollow where the body was found. Holmes can't find anything to fault in Gregory's investigation. Whatever he asks, Gregory is there already. Until Holmes picks a spent match off the ground near where Straker was found dead.

"I cannot think how I came to overlook it," says Gregory, crestfallen.

Holmes is on a roll now, and tells Gregory that he and Watson need a little more time to look around the moor. Gregory leaves them to it. With the sun on the horizon and the ferns and brambles golden red, they set off to find Silver Blaze. They apply the scientific method to their problem, and an hour later, with the twilight turning the landscape grey they succeed where Gregory failed.

"See the value of imagination," says Holmes to Watson. "It is the one quality which Gregory lacks. We imagined what might have happened, acted upon the supposition, and find ourselves justified."

Now they have found the missing horse, Holmes decides to play a little game with Colonel Ross, to pay him back for his failure so far to be impressed. He insists to Watson that they keep their discovery a secret.

But what about the murder? It's dark by the time they get back to King's Pyland. Holmes announces that they have done all they can and are going to catch the night train back to London. He's quietly pleased with himself. Colonel Ross is

disappointed and entirely unimpressed with Holmes. Holmes and Watson get into the carriage to ride back to the railway station. As they are about to leave, Holmes asks one of the stable-boys an apparently unconnected question about the medical problems of local sheep, and is very pleased with the answer. Inspector Gregory is intrigued.

“Is there any other point to which you would wish to draw my attention?” he asks.

“To the curious incident of the dog in the night-time,” says Holmes.

“But the dog did nothing in the night-time.”

“That was the curious incident.”

And with that the carriage sets off. What is Holmes getting at? He is inviting Gregory to invent a proof by contradiction, along the following lines:

<i>Suppose that Simpson came to the stable that night.</i>	(hypothetical fact)
<i>There was a dog in the stable.</i>	(fact)
<i>Simpson is a stranger.</i>	(fact)
<i>Dogs bark at strangers in the night.</i>	(general rule)
<i>Therefore, supposing that Simpson came to the stable that night, the dog would have barked.</i>	(conclusion)
<i>But we know the dog didn't bark that night.</i>	(fact & contradiction)
<i>So Simpson can't have come to the stable that night.</i>	(conclusion)

We know the dog didn't bark because the other stable-boys, asleep in the loft, would have woken up. They were not drugged. We can go further and say that whoever came to the stable was not a stranger to the dog. Whoever came presumably also arranged for Ned Hunter's curry to be drugged. This narrows down the number of suspects rather sharply. If you haven't read the story already I won't completely spoil the ending for you. Needless to say, eventually the horse is recovered and the murderer unmasked. Reading between the lines we notice that Holmes probably makes a considerable amount of money out of the case by betting on Silver Blaze at 15-to-1 in the Wessex Cup while the rest of the world believes that the horse is lost for good. Colonel Ross is finally impressed with Holmes. Holmes offers him a cigar.

While Conan Doyle's Sherlock Holmes stories are entertaining, to be honest they are mostly not very good examples of logical argument. A lot of the stories rely on Holmes' remarkable powers of observation. Sometimes there is a lesson for us — for example in *The Norwood Builder* the police at first miss a key piece of evidence. They miss it because at first it wasn't there. It was planted later. But generally, we need to look elsewhere to practice our skills of logical argument.

Newspaper articles are good places to look. When you do this you will find that many down-market newspapers don't present conclusions justified by reasons,

but merely string together a sequence of opinion and speculation: unsupported “facts” that the reader is asked to accept on trust. (Most readers are happy to do this because they already believe these “facts.” Remember confirmation bias? People tend to seek out and accept new information which confirms their existing beliefs.)

Better newspapers and news magazines attempt to give reasons for their conclusions, but of course they don’t hand you syllogisms. That would be far too boring. Instead they are written as enthymemes, with many assumptions that you, the reader, have to fill in for yourself. Rather than just reading these articles and believing their conclusions, you should always think “Exactly what is being assumed here? Is that really true?” Practice talking back to the article. After each paragraph, say “So what?” A well written article, for example from the *Economist* or the *New Yorker*, is like one half of a conversation. The next paragraph will actually pick up on the other side of the discussion and answer your “So what?”

Other than this kind of practice, is there anything else that you can do to improve your powers of logical analysis? Some kind of “performance enhancing drug” for the mind, perhaps? We like to think that modern science can produce frightening and magical chemicals to turbo-charge our brains, but the evidence is equivocal. Some of the “smart drugs” appear to merely give their user the impression that their performance is being enhanced, without actually improving it. Others seem to increase short-term concentration at the price of long-term amnesia about whatever you were concentrating on. And we know almost nothing about the long-term health impact of routinely taking these new drugs.

However, there are two drugs that we know do improve your performance at logical analysis. They have been around a long time, and their side effects and long-term health impact are well understood. They have been used in Europe since the seventeenth century and they were commonplace in Victorian England. Holmes uses them routinely — in *The Hound of the Baskervilles* we find Holmes sitting in his Baker Street rooms, thinking hard about the case in Devon. He tells Watson that his body has “consumed in my absence two large pots of coffee and an incredible amount of tobacco.” The drugs are caffeine and nicotine.

Scientists and engineers, social and political revolutionaries, all of them were absolutely wired on caffeine and nicotine for the 300 years from about 1650 to 1950. After that, the rate of smoking tobacco dropped off due to its bad long-term effects on the health of its users. The rate of coffee consumption is of course still pretty high. Personally, I’m quite happy drinking two or three cups of coffee a day. I’m absolutely not suggesting to you that it is a good idea to smoke tobacco. But in a spirit of historical enquiry, I think we should have a good idea what help our predecessors had in their analytical thinking.

A cup of coffee contains about 100mg of caffeine. It takes between 30 minutes and an hour to take its full effect after you drink it. After that it slowly decays,

with a “half-life” which varies widely between people, but is generally around 5 hours. (So 5 hours later it will have half as strong an effect, then 5 hours after that half as much again, and so on.) In pregnant women, or women on the pill, the half life is about twice as long.

Caffeine is a stimulant, boosting attention and memory. Users of caffeine suffer withdrawal symptoms such as feelings of fatigue and inability to concentrate for a few days when they stop taking it. This has led some researchers to conclude that the supposed benefits come solely from alleviating these withdrawal symptoms. However, there’s evidence that this withdrawal effect is weak and is only significant in people consuming 5 to 10 cups a day. For lower levels of consumption, caffeine really does boost mental performance.

The optimum level appears to be about 200mg, which you could achieve by having two cups of coffee. Pearl Martin and her colleagues at the University of Queensland in Australia performed an intriguing experiment that demonstrated that at these levels their subjects became more easily convinced of the truth of a strong logical argument, but caffeine made no difference with a weak argument. It appears that caffeine really is the drug of reason.

The problem with caffeine is of course that it keeps you awake, so having it late in the day is a bad idea. As we have seen, if you sleep badly you will be impaired in lots of ways. In previous centuries when smoking was widespread, people could offset the effects of caffeine with nicotine because the two drugs interact in an interesting way.

Nicotine has its effect within a few seconds of inhaling tobacco smoke and has a half-life in the body of about two hours. At low doses it is a stimulant, increasing concentration and alertness. (It appears to improve the symptoms of ADHD, and perhaps in the past people with ADHD self-medicated by smoking.) However, it also reduces the half-life of caffeine to around two hours, so it is possible to drink more coffee or to get to sleep sooner after drinking coffee. In addition, at high doses, nicotine becomes a sedative. So the eighteenth-century gentleman could smoke and consume coffee all day in a coffee-house then smoke himself to sleep in the evening.

Of course the problem with nicotine is that it is highly addictive — no less addictive than cocaine or heroin. And smoking kills you in various ways, principally by lung cancer or heart disease. There are suggestions that the lung cancer might be a recent development, caused by the use of mildly radioactive apatite fertiliser since the early twentieth century. But even if that is true and you can find organic tobacco, the other health risks would still be severe. I really wouldn’t recommend it.

Before we leave the topic of logical arguments, I need to mention another health risk. This is a matter of recent research, and still highly contentious, but I think I owe it to you to warn you about it.

In 2009, psychiatrist J. Anderson Thompson and psychologist Paul Andrews published a survey paper *The Bright Side of Being Blue: Depression as an Adaptation for Analyzing Complex Problems* in *Psychological Review*, a journal of the American Psychological Association. Analysing the findings of 352 other papers and books, Thompson and Andrews put forward the radical theory that depression might have a purpose, that rather than merely being “malignant sadness,” it might actually be good for something.

This is a dangerous theory, because it directly contradicts the conventional wisdom that depression is essentially a chemical disorder of the brain, best cured by drugs. It’s only to be expected that people who sell drugs or prescribe drugs are going to be hostile to an alternative theory. People don’t like having their beliefs challenged, particularly when there is money at stake. However, as Thompson and Andrews point out, in clinical trials antidepressants often have no significant effect compared with placebos. When they do have an effect, it seems to be only in cases of severe depression. Relapse occurs promptly when the drugs are discontinued. This looks like evidence that the drugs are treating a symptom rather than the cause of depression.

Thompson and Andrews suggest that depression may be like a fever. A fever hurts us and disrupts our life, but it has a purpose in fighting infection. Of course, in some cases the fever can run out of control and kill us, but that’s rare. Perhaps it is the same with depression. Although there are a few cases where the depression is so severe it can cause death by suicide, that’s rare too. Although like a fever it causes suffering, perhaps mostly depression could be helpful, and merely treating the symptoms might only prolong the suffering. But how could depression be helpful?

Thompson and Andrews think that a depressed mood is actually triggered in response to an important complex problem. Just as our adaptive unconscious triggers different emotions in response to the world around us, and those emotions steer our thinking, in their *analytical rumination hypothesis* the adaptive unconscious triggers a depressed mood in response to an important complex problem that we are unable to solve. This depressed mood then steers us into slow, sustained analytical thinking in several ways: we find that we can’t stop thinking about the problem; it’s difficult to concentrate on other things. We don’t feel like doing other distracting things; we are not interested in enjoying ourselves, even in having sex. We are not interested in engaging with other people, and we lose our appetite, further reducing distractions. And of course, we feel pain and suffering. But the purpose is achieved: in their paper, Thompson and Andrews survey a large number of apparently contradictory experiments and demonstrate that people in a depressed mood really are better at analytical thinking.

If their idea is correct, then something rather clever is going on here: the adaptive unconscious registers that there is a serious problem that it can’t resolve, that

can only be resolved by conscious analytical reasoning. Its as though there's a box labelled "in case of emergency break glass." The adaptive unconscious registers that there is an emergency and smashes the glass. And so our mood darkens and our analytical powers are focused on to a task not consciously chosen. There's no reason why we would consciously know what was happening, just as the house-buyers in the previous chapter did not consciously know what kind of house they really wanted to buy. We don't have privileged access to our own unconscious minds. Often other people can see us better than we can ourselves.

So why did I feel the need to warn you about this? Am I suggesting that you should play sad music and think bleak thoughts to improve your analytical reasoning? No, I'm not. That would probably work, but it would be quite dangerous. No, I'm actually concerned about another effect. Unfortunately, Paul Andrews has shown that the the link between depression and analysis runs both ways: when you are thoroughly focused on an analytical task, that *makes* you feel more depressed. Which of course, makes you better at the task. Presumably the adaptive unconscious, observing you devoting so much attention to a particular task, comes to the conclusion that this is an Important Complex Problem. So if you focus for a long time on any analytical task that you treat as very important, you risk becoming depressed.

This is the danger. You might feel that you are walking through life wearing lead boots. Whatever you achieve won't seem good enough. You'll doubt yourself, whether you can ever do what you set out to, whether you are any good at all. It will be an effort to go on. You'll ask yourself, "What's the point?" This pattern of thought has happened countless times to analytical thinkers, from artists to engineers, throughout recorded history.

If you solve the problem, or decide that it isn't important, then the depression will ebb away. The colour will start to seep back into your life. But if you don't realise what is happening to you, then you might notice that you are depressed, and be frightened about *that*. You might fall into the kind of pointless recursive rumination about being depressed that seems to be a key feature of long-term depression. (If your Important Complex Problem is *being depressed*, rumination will certainly not solve that.) You might decide to dull the pain by taking drugs, either legal anti-depressants, alcohol or illegal drugs. It really is best if you can avoid that. So, notice what is happening to you. You can keep going and use the depression to help solve your problem. You can reconsider whether the problem actually is important. Maybe it isn't. Either way, realise what is happening and don't get stuck.

Chapter 4

Tricks

In north London, on Walthamstow High Street, there's a jeweller and pawnbroker. It's a couple of minutes walk from the Tube station, sandwiched between a Chinese take-away and a chemist's shop. It's not a wealthy part of town; the shop-fronts are a bit threadbare; the jeweller advertises prominently that it also cashes cheques. The door is locked, so Tracey rings the doorbell and waits to be buzzed in on the electric latch. She's tall and elegant, blond high-lights contrasting with her smart black coat and high heels. Inside, a shop assistant presses the button to open the door and Tracey comes in. Let's watch a robbery go down.

Tracey smiles and says "Hiya!", shivering and rubbing her hands together. "God, it's so cold!" Tracey's accent reveals that she's not quite as posh as her clothes.

"Yes, I know, it's horrible today," says the shop assistant.

"I'm looking for a necklace," explains Tracey. She gestures round her neck to show how long, and takes off her black leather gloves.

"Gold or silver?" asks the assistant.

"Silver," she says, as the assistant turns away to let in another customer. It's a man, bundled up in a winter jacket over his business suit. The shop assistant turns to greet him while her older colleague starts to show some necklaces to Tracey. The man just wants to look at rings in the display cabinet. He doesn't seem in a hurry to buy anything, so they leave him to browse and concentrate on Tracey, who looks eager to spend money on the right necklace.

"Got a nice one here," says the older assistant.

"Yeah, that's the sort of length," says Tracey, as they cluster around. "How much is this one?"

"It's quite expensive, actually," says the older assistant.

"Whoo!" says the first assistant, catching sight of the price tag. Tracey smiles and laughs.

"Six hundred and twenty pounds," says the older assistant.

But Tracey is happy; this is the one for her. She says she'll have it, and takes out a stack of twenty pound notes from her handbag. She counts them out, one hundred at a time, onto the counter, but just as she is finished, it happens. The browsing man turns and quickly grabs Tracey by the arm.

"Okay. Stop right there. Police!" he says loudly.

She turns to him, mouth open in surprise. He flourishes a police warrant card in his other hand.

“Walthamstow Police!” he says.

“What?” says Tracey and tries to pull away.

“Tracey, I’m placing you under arrest for deception and fraud.” He turns to the shocked assistants and says “Leave that money on the counter. Please let my colleague in.”

There’s another plainclothes policeman outside, pressing his warrant card to the glass of the door. They let him in. A bit older and balding, he’s clearly number two in this operation. He takes Tracey by her other arm and leads her away from the counter. The assistants look at her with tight lips. The first policeman starts dealing with the evidence.

“We’ve been following her all day,” he explains. “There’s been counterfeit cash. She’s been passing it off at jewellers.”

The assistants eye the stack of cash dubiously. They nearly accepted it.

“Can I have a look?” one asks.

“Yeah, go ahead,” says the policeman, as he starts to stack it up and put it into evidence bags. “They’ll all go in for evidence, for her.”

The first shop assistant is now turning the the silver necklace over in her hands, looking at it. The policeman looks at her regretfully.

“I’m afraid that’s part of the evidence as well, now.” Then he smiles. “You will get it back, obviously!” He continues to bag up the cash. When he’s finished, he picks up another evidence bag and holds it open.

“I’d ask you just to pop that in here,” he says.

The assistant holds the necklace between finger and thumb, as though it’s dirty, and drops it into the bag.

“Thank you,” he says.

The assistant looks down, then over at Tracey, who’s now in handcuffs. The second policeman’s ready to take her back to the police station. He has the appearance of a man who’s looking forward to a cup of tea after standing around in the cold all day. Tracey looks glum.

“You bitch,” says the assistant. “You could have cost me my job, you know that?”

The second policeman doesn’t want a big scene, so he takes Tracey outside and they wait in the doorway while policeman number one finishes up the paperwork with the assistant. She writes the shop’s address on the form attached to the evidence bag and hands it back to him.

“Okay,” he says. “I’ll be back in one hour. I’m going to take a full statement from you, because obviously, it’ll go down as evidence for her, yeah?”

The policeman leaves, stuffing the evidence bags into his coat pocket as he goes out of the door. The assistants start to relax. Excitement over. Maybe it’s time to

put the kettle on and have a cup of tea.

Did you spot the robbery? All of this really happened, filmed through hidden cameras for the BBC TV programme *The Real Hustle*. The programme shows real-life scams, executed on unprepared “marks” like these shop assistants. In “The jewelry shop scam,” Tracey is actually presenter Jessica-Jane Clement and the policemen are co-presenters Alexis Conran and Paul Wilson. The money was real, not counterfeit. It was just a prop for the scam. When did the robbery happen? Conran, playing policeman one, walked out with the necklace in his “evidence bag” right at the end.

In this chapter I’d like to explore the general principles behind scams like this. Scams are built out of a number of carefully chosen little tricks. There must be hundreds or thousands of these tricks, but they all fall into only a few categories. Similar tricks are used by other, more legitimate, persuaders like car salesmen, marketers, lobbyists and advertisers. Their tricks fall into the same categories. When you know about the categories, you will be able to see how a scam worked after it’s over. There’s no fool-proof way to defend yourself against these tricks, but understanding the categories will make you somewhat more resistant. And of course, knowing the categories will help you make up new tricks of your own. Dangerous knowledge.

I’m going to rely heavily on the work of experimental psychologist Robert Cialdini. He started his academic career in the 1970s with a three year stint working alongside and observing “compliance professionals”: salespeople, fund-raisers, advertisers and so on. His textbook *Influence*, now in its fifth edition, summarises decades of work and shows how their myriad tricks fall into only six basic categories. These are the principles of **reciprocation**, **scarcity**, **authority**, **commitment**, **liking** and **social proof**. As we’ll see, they are closely related to the moral arguments that we met in chapter two.

Let’s start with **reciprocation**. This is the principle that people are more likely to take an action in return for something they previously received. Or to put it another way, people like to say “yes” to those they owe. I think you’ll find it easy to agree with me that this principle exactly corresponds to the moral value reciprocity/fairness. A reciprocation trick plays on our innate sense of fairness by using a small “gift” to extract a bigger pay-back.

It’s important to note the way that this works: first the gift, then the obligation, then the pay-back. It works better if the gift is unexpected. For example, suppose someone approaches you, offers you a flower, and without thinking you take it. You don’t want it, but they aren’t taking it back. They say “It is our gift to you.” It seems rude to drop it on the floor. The flower-wielder’s accomplice then asks you to make a donation to their charity. Probably you do so. Then probably when they aren’t looking you put the flower in a bin. (And when *you* aren’t looking they take the flower out of the bin and use it again on their next mark.)

You are put in a similar predicament when a charity sends you some cheap gift like a pen or some address labels and asks for a donation. You don't want the gift, but you don't feel you can just throw it away. Perhaps you send them a donation to resolve your feeling of obligation. After that, you feel happy to throw the gift away or forget about it.

The principle says to do unto others as you would have them do unto you, *but do it first*. Asking for a donation first and giving the flower in exchange afterwards simply wouldn't work. That is just selling flowers, a purely commercial transaction. The gift has to come first. A small gift can be surprisingly effective. Cialdini notes that mailing out a \$5 cheque with an insurance survey prompted completion rates far higher than a mail-shot that promised \$50 afterwards in return for sending back a completed survey. This technique was even more cost-effective than you might think, because the people who decided not to fill in the survey almost never cashed the cheque. It wouldn't feel fair.

Larger-scale donations and pay-backs can be seen throughout politics. I don't mean outright bribery and corruption, where crooked politicians consciously sell their influence, but rather a more subtle feeling of obligation. Whether they notice it or not, the recipient of a political donation tends to feel beholden to their donor. Although politicians might insist that they take the money then vote the way they please, the statistics show otherwise. (The fact that so many businesses in the USA contribute equally to rival candidates also demonstrates that they are not attempting to get one elected rather than the other. Instead they are stockpiling obligations for the future regardless of who wins.) Even scientists, who like to think that they are unbiased, are influenced by financial contributions which apparently have "no strings attached." Their findings tend to be much more supportive of the interests of their sponsors. No one is immune from reciprocity. (Except probably psychopaths. Do any of these techniques work on psychopaths? It's not clear.)

The gift doesn't even have to be a tangible item, it can be a concession. Cialdini calls this variant "rejection-then-retreat." Supposing I ask you for a big favour, but you turn me down. What happens if I now come back and ask you for a smaller favour? Surprisingly, you are more likely to agree to the smaller favour than if I'd asked you for that the first time round. It's as though by asking for less than I need, I'm making a concession to you and that concession feels to you like a gift, a gift that you pay back by doing me the small favour.

When we look at the jewelry shop scam, can we find a trick there based on reciprocation? At first sight no — but think about the reaction of the assistant to Tracey near the end. She says, "You bitch! You could have cost me my job!" It looks as though the policemen have given the assistant a tremendous gift. They have saved her job. Obviously, she's going to be more cooperative after that, at the point in the scam when the robbery actually happens.

How can you defend yourself against this technique? The defence against all these techniques is first to engage your conscious brain, to stop and think. The techniques work on the adaptive unconscious and they work best on distracted people under time pressure. So the first defensive step is always to stop and think. In this case, when you have stopped, ask your self this question: is it actually a gift, or is it a trick? When you see it for what it really is, then it loses its power.

Cialdini's second category is **scarcity**. This is the principle that we tend to over-value things that seem scarce and things that are likely to be unavailable in the future. I think this principle corresponds to the moral value of harm/care. This time the link isn't so clear, but it seems appropriate to me because all the scarcity tricks rely on forming a feeling of loss or potential loss in the target.

For example, suppose a supermarket has a few remaining TVs on a "special offer" display. You've been looking for a new TV but haven't made your mind up. Seeing the few left on the display gives you a slight pit-of-the-stomach feeling. There are so few left, they must be a bargain. You should go away to think about it, but maybe they will all be gone before you come back. It's hard to resist.

At Christmas there is often a "must-have" children's toy, and the thing that makes it most valuable to children and their parents is that it is in short supply. Once the toy is a "must-have," parents will go from shop to shop looking for it and they will pay inflated prices when they finally find one.

Even something that we can have but others can't seems more valuable. Classified intelligence reports carry far more weight with their readers than is warranted simply because they are secret. Often their core information is gleaned from two disreputable men chatting in a bar. You would have no confidence in them if you met these men in person, but once their words are typed up in a report, the restricted circulation gives it an added aura of credibility.

The root of all these effects is the possibility of loss. Decades of psychological experiments have shown that we do not weigh gains and losses equally: losses loom much larger than gains. Psychologists say that we show "loss aversion." At first this sounds completely facile: obviously anyone would rather have a gain than a loss. But that's not what they mean. What they mean is that we value something that we have, but might lose, more highly than something that we don't have, but might gain. Even if the things are absolutely identical.

This effect is also known as "the sunk costs fallacy" and the "endowment effect." It explains why people in auctions can end up paying far more for something than they intended. They make a bid and are winning the auction. Someone bids against them. They counter-bid. At some point they are close to their "fair price" and their bid is the last. They feel that they now have the item. It's theirs. They own it. Then someone else tops their bid. They have lost the item. It's just as if the counter-bidder had walked into their home and taken it off a shelf. They feel the loss. And in that very moment, it feels more valuable. They make a slightly higher

bid, in line with the new value. And so does the counter-bidder. And again. And again. Eventually someone drops out, and often the loser is left with the thought “Thank heavens I didn’t win! What was I thinking?”

Rather disturbingly, we can often frame the same situation in terms of a gain *or* a loss. We can then be prompted into making a different choice depending on how it is framed. Cialdini describes the example of an energy-saving “home efficiency audit.” After the audit, one group of householders were told how they could gain, saving say 50 cents a day, by installing insulation. In contrast, the other group were told that they were currently *losing* 50 cents a day, but they could stop that by installing insulation. Over twice as many people from the second group decided to install insulation. Obviously, the situation was exactly the same, the only difference was how it was framed.

Even more strangely, the risks that people are willing to take also depend on whether the situation is framed in terms of gains or losses. With a gain, “A bird in the hand is worth two in the bush,” and people prefer a sure thing rather than gamble for more. But with a loss, people are inclined to play “double or quits,” and take a risk rather than swallow a sure loss. Since the same situation can be framed as a gain or a loss, we can be driven to take different risks depending on how a situation is presented to us.

A particularly easy way to generate scarcity in a scam is to impose an artificial time limit. “For one day only,” or “Deal only valid until you leave the premises,” or “My ride’s going to leave. Do you want to buy it or not?” All scams work better when the victim is distracted and under time pressure, but this is doing something extra. It creates scarcity from nothing, making the deal much harder to resist.

Do we see scarcity in the jewelry shop scam? It’s not so obvious as in other scams. There isn’t a time limit or scarce item, but we certainly see loss aversion used as a trick. The scam-within-the-scam, where Tracey seems to pass off counterfeit cash, generates a sense of loss in the shop assistants. They are made to think about the loss they nearly suffered, maybe even losing their jobs. It’s such a relief to be spared that loss that they don’t really notice the actual loss when it happens — after all, the policeman says with a smile “You will get it back, obviously!” Not really a loss at all.

How can you defend yourself against scarcity tricks? First, notice that you are feeling more agitated. If you are feeling agitated, you know that you are not thinking straight. Calm down and take your time. Yes, you will feel a pit-of-the-stomach feeling of “I could lose this.” But ask yourself why do you really want this one, right now? Just because it looks scarce? That doesn’t actually make it better. And maybe it’s not really even scarce. Maybe it’s just a trick.

The next category is **Authority**. This is the principle that we tend to obey people who look like they are in charge, that we tend to defer to people who seem to be expert. I think that you’ll find it easy to agree that this corresponds

to the moral value authority/respect. The classic example used to demonstrate the power of this principle is of course Stanley Milgram's infamous "electrocution" experiments from the 1960s.

In the good old days before ethics committees, research psychologist Stanley Milgram wanted to investigate how the terrible things done by the Nazis in the Second World War could have happened. Were the people who did these things devoid of morals? Or were they ordinary people who knew that they did wrong, but they did it anyway because they were told to by the authorities? To what extent do people just follow orders?

Milgram put an advert in the local paper, asking for participants in a "study of memory and learning" and offering \$4 for the one hour experiment. The experiment itself was really a carefully designed scam. When the unwitting subjects arrived at Yale University, they found Milgram dressed in a white lab-coat and carrying a clip-board, the very image of a respectable scientist. Milgram explained that one of the two subjects in that session would be the "Teacher" and the other the "Learner." These roles would be chosen by lot. The Teacher's job was to test the Learner's memory and to deliver increasing electric shocks for each mistake.

In fact, the other subject was an actor, and Milgram arranged that he always played the Learner. Milgram took him to a nearby room, and came back to direct the Teacher, always played by the true subject of the experiment. As the experiment progressed the Learner made mistakes, and each time Milgram directed the Teacher to follow the planned experiment, increasing the voltage and delivering another electric shock. The settings increased in 15 volt increments up to 450 volts. Of course, the experimental setup was fake too. There were no electric shocks.

Before the first experiment, Milgram surveyed colleagues at Yale to see how far they thought the subjects would go. How many would go all the way to 450 volts? Professional opinion was that maybe 1 in 100 or 1 in 1000 people would go that far. They were wrong. Around 2 out of 3 subjects followed through right to the highest settings, despite hearing first cries, then pleas to stop, screams, and finally an ominous silence from the Learner in the nearby room. They made it clear to Milgram that they were very unhappy to keep going, but Milgram told them that they must, and they did. They bit their lips, trembled and stammered, pulled their ears and clawed at their own flesh. But they did what they were told.

After a whole series of these experiments in the 1960s, Milgram concluded that the primary lesson was that adults were very willing to go to almost any lengths at the command of an authority. The Nazis were not different people, they were not less moral. No, for the most part they were just people following orders, and ordinary Americans in Milgram's experiments would have done just the same. He tried many variations on the experiment, with essentially the same results. When he made the authority figure more disreputable, the subjects were only slightly less willing to obey. The trappings of authority send a powerful message.

Scam artists can exploit this by giving themselves titles and introducing themselves as Doctor or Professor. Diplomas on the wall are a sign of authority, as is an ID badge or a business card for a claimed identity. Clothing has a big effect, from the uniform of a security-guard, through the semi-uniform of the lab-coated scientist to the suit and tie of the businessman. They are all trappings of authority. Tools of the trade, such as a clip-board, can give further reassurance, and even an accent or manner of speaking can give an aura of authority.

So, we are very likely to obey the orders of an apparent authority. We are also very likely to take the advice of an expert who appears to be a “credible authority.” What makes them a credible authority? Well, first they have to look like an authority — with appropriate trappings — but they also need to appear trustworthy. Experts can build trust over time, working with the same people again and again, but Cialdini describes a trick which works straight away. This is to confess a small but relevant weakness just before giving the expert advice. Never make your best point then follow up with a minor caveat. Do it the other way around. Say “there’s this small related problem you need to know about,” and tell people the caveat. Then say “but,” and go on to lay out your strong point. The word “but” indicates to your audience that they should put aside what you just said: the real message is coming next.

The jewelry shop scam is, of course, absolutely built around authority. The fake warrant cards, handcuffs, evidence bags, the unfashionable winter coat over suit-and-tie, the air of command, everything the “policemen” do just shouts authority. So the shop assistants do exactly as they are told.

How can we defend ourselves against authority tricks? As always, time to think helps a lot. Ask yourself is this person really an authority? How do I know? And if they are really an authority, should they be telling me to do this? Is that really what an authority would do?

If they claim to be an “expert,” ask yourself firstly whether they are an expert on this particular thing. Even genuine experts on one thing can falsely think they are experts on another thing. And if they really are an expert, can you expect them to be truthful? Or do they have vested interests? Did they carefully give you a piece of negative information about themselves just before they offered you their advice?

Let’s next go on to Cialdini’s fourth category which is **commitment**. This is the principle that people prefer to be consistent: they prefer to do what they said they would do; they prefer to do things in line with their past actions. Of all Cialdini’s categories, this seems to have least to do with moral arguments. It seems much closer to Festinger’s idea of “cognitive dissonance” that we met in the previous chapter. (A point that Cialdini himself emphasises too.)

Cialdini gives the amusing example of a researcher who posed as a volunteer worker going door-to-door in California, asking residents if they would allow a

“public-service” billboard to be installed on their front lawns. To give the residents an idea what it would look like, the researcher showed them a photograph of a very large and poorly lettered sign saying “DRIVE SAFELY.” In the photograph the sign more-or-less hid the house behind. Not surprisingly, less than 2 out of 10 residents agreed. However, one particular group of residents did agree in much greater numbers: over 7 out of 10 of them said “yes.” What was different about that group?

Two weeks earlier, a different researcher, also posing as a volunteer worker, had asked that group to display a little sign, only 3 inches square, which read “BE A SAFE DRIVER.” The influence of saying yes to this seemingly innocuous request was enormous, even weeks later. This is what salesmen call a foot-in-the door technique. First ask for a very small concession, then later ask for a much bigger related concession.

How does this work? It appears that our adaptive unconscious maintains an assessment of what kind of person we are, and we tend to act consistently with this assessment. When we are influenced to act somewhat differently, our adaptive unconscious re-evaluates what kind of person we are, and we tend to act consistently with that new assessment. As Cialdini notes:

You can use small commitments to manipulate a person’s self-image; you can use them to turn citizens into “public servants,” prospects into “customers,” prisoners into “collaborators.” Once you’ve got a person’s self-image where you want it, that person should comply *naturally* with a whole range of requests that are consistent with this new self-view.

Be careful what small things you agree to do. The same researchers tried a related experiment where instead of first displaying the little sign, they asked people to sign a petition that supported “keeping California beautiful.” Two weeks later they were asked about the big “DRIVE SAFELY” sign, and half of them said yes! The experimenters were at first at a loss to explain this, but then they realised that these people’s self-image had been changed, into the kind of person “who does this sort of thing, who agrees to requests made by strangers, who takes action on things he believes in, who cooperates with good causes.” Cialdini says that he rarely signs any petitions any more, even when he already supports them. He thinks it’s too dangerous for his self-image.

However, not all commitments change self-image. To have this kind of influence, a commitment must be a deliberate choice, made in public and it must feel like a free choice. When we feel coerced, this induces a backlash. When we feel forced into something our self-image doesn’t change. So, badgering someone to do something, or even giving them several strong arguments for something, is counterproductive. One good argument is more convincing than several great ar-

guments. Several arguments, even several great arguments, can be confusing and *feel* like badgering. In contrast, people who are only only barely convinced feel that they made a free choice for themselves. Their new self-image will drive them to fill in the rest without effort. Stand back and let them do it.

Explicit public commitments are more effective than private or implicit commitments. Cialdini gives an example which reduced the rate of no-shows for bookings at a restaurant. Previously, the booking-taker at the restaurant had said “Please call us if you change your plans.” The restaurant changed this script very slightly to “*Will* you please call us if you change your plans?” The booking-taker was instructed to then pause, waiting for a reply. The customer filled the pause by replying, “Yes.” No-shows dropped from 3 in 10 bookings to 1 in 10 bookings.

Written commitments are even more effective. Companies selling door-to-door found that sales went down when new laws setting a “cooling-off” period made their previous scarcity-based tricks ineffective. Many people who had agreed to the pressure-selling tactics on the day cancelled their agreements after they had time to think. However, the companies discovered that they could counteract this by getting the customers to fill out the sales agreement themselves in their own handwriting. Cancellations fell dramatically. People want to deliver on commitments they have written down, particularly where these commitments are witnessed by other people. It seems that the more effort that goes into a commitment, the more it changes the self-image of the person who made it.

Do we see commitment tricks in the jewelry shop scam? It’s quite subtle, but when you look carefully, commitment explains lots of little points in the script. The policeman tells the assistants to “Leave that money on the counter.” They show no sign of doing anything else, but of course they obey in this trivial request. Then he asks them to let in his colleague, which of course they do. It all looks very official. One little request leads to another, a cascade of compliance. At the very end we see the assistant filling in the form on the evidence bag *in her own handwriting*. She is completely committed to believing the scam.

How can you defend yourself against commitment tricks? That pit-of-the-stomach feeling can give you a clue. If you get that queasy feeling that you have been set-up, that you are being led a step too far, you can just stop and back out. Once the trick is visible to your conscious mind, it’s been defeated. The worst the scammer can do is to complain at you for not being consistent, which you can probably brush off as mere whinging.

If you don’t have that pit-of-the-stomach feeling, but you still have suspicions, you could try the “heart-of-hearts” technique: ask yourself, if you could go back in time knowing what you now know, whether you would make the same choice again. Say you decide to buy a particular car, but after making your choice the salesman says “I’m very sorry, but that special deal isn’t available any more, I’ll have to charge you the regular price.” (This technique of deliberately renegeing on

their *own* commitments is known by salesmen as the “low-ball” technique.) Would you still buy it? Ask yourself, in your heart-of-hearts, what you would do if you knew at the very start that this would be the price. Probably you will walk away.

Cialdini’s last two categories are **liking** and **social proof**. They are related but different. Liking is the principle that people tend to say “yes” to those they like. Social proof is the principle that people tend to follow the lead of others, to look around and see what’s normal and then do the same. I think that liking corresponds quite strongly to the moral value ingroup/loyalty, but social proof appears not to be based on moral values. Let’s look at liking next.

We find our friends more convincing than strangers, and not just because they have built up a trustworthy reputation over time. In general we believe people who we like, and we believe people more if they seem similar to us or attractive in some way. Physical attractiveness has a very large effect on how we treat other people, though we don’t realise that it does. Cialdini gives many examples where researchers have found that attractive politicians get more votes, attractive job applicants get hired more and paid more, attractive criminals get lighter sentences, and so on. The only exception is when an attractive person is seen as a romantic rival. Other than that, physical attractiveness has a kind of “halo” effect, translating in other people’s eyes into perceived intelligence, good-will and trustworthiness.

Even if they are not especially attractive, people who look and act the same as you also seem more convincing. We like people who are like us, for example if they dress the same, or have the same interests. In other words, people who seem to our adaptive unconscious part of the same “ingroup.” Successful salesmen are adept at finding similarities with customers and pointing them out. These really do make a difference. Even a trivial similarity like a similar sounding name can make a large difference to success rates.

We also like people when they like us, so we tend to like people who smile at us. However, to be convincing, you need a true “Duchenne” smile, which is hard to fake. We also unconsciously tend to mimic people who we like, adopting a similar posture, speaking in a similar way and mirroring their gestures. A salesman can consciously and deliberately “mirror and match” their customer to exploit this effect. But there’s a risk in doing this that it won’t quite ring true. If the customer consciously notices the trick, it will just seem creepy and dishonest, scuppering any deal. It’s more reliable to just boldly say “I like you” or something similar, because we seem to be suckers for praise, even when we realise that it’s insincere.

Even mere familiarity can breed liking. The key here is that it must be in the context of a situation which is cooperative or at least neutral. In that setting, the more we see someone, the more we like them. However, when we are forced into contact with people under unpleasant conditions, where there is frustration, competition and conflict, then the more we see them, the *less* we like them. This is exactly as you would predict from the moral value ingroup/loyalty: people whose

status is initially unclear will be gradually sorted by our adaptive unconscious into two categories: “ingroup,” who we like and “stranger,” who we have contempt for. (It’s possible to revise this classification by distracting people and getting them to engage in a common cooperative task, but it’s hard work.)

Cialdini gives another example, which we might call “shoot the messenger,” where events themselves rub off and influence whether we like someone. He was once called by a distraught weatherman from the local TV station, who wanted to know why people hated him so much. The weatherman was getting hate mail:

“One guy threatened to shoot me if it didn’t stop raining,” he said.
 “Christ, I’m still looking over my shoulder from that one.”

Cialdini explained that it was just human nature to associate good or bad news with the person carrying it. In ancient times a messenger carrying good news could expect to be lauded as a hero, while a messenger carrying bad news would get a terminally frosty reception. The weatherman was just an innocent messenger, blamed in the same way. When he understood this, the weatherman saw that his situation literally had a bright side. As he said:

“I’m in Phoenix where the sun shines 300 days a year, right? Thank God I don’t do weather in Buffalo.”

Turning back to the jewelry shop scam, can we see any tricks based on liking? Tracey is obviously a very likable woman, attractive and well-dressed. But from her accent, she is closer socially to the shop assistants than you might assume from her clothes. She would be the perfect person to operate the pretend scam-within-the-scam of passing counterfeit cash. This is what makes the subsequent turn of events so convincing. The division of roles between the first policeman and his backup was also well chosen: the first policeman is clean-cut and handsome, while his backup is heavier, balding and less attractive.

Can we defend ourselves against tricks based on liking? Cialdini notes that there are so many potential tricks that it’s pointless trying to look out for them. Instead, he recommends that we should be on our guard for their *effects*. Stop and think: do you feel an unusually strong rapport with the salesman who you only met 20 minutes ago? If so, spend a moment to separate the person from the deal. After all, this person is not going to be your new best buddy. You are only going to get the deal. Is it a good deal in itself? Would it still seem like a good deal if someone else was offering it?

Let’s turn now to Cialdini’s last category, **social proof**. This is the principle that we look at the people around us and we tend to act the same way. This seems to be based on the “availability heuristic,” which says that we consider things more

believable when they come easily to mind. Social proof is related to that effect: when people do something right in front of us it's easier to believe that it's normal. When a lot of people do something, it's easier to believe that it's normal. But most people don't realise how influenced they are, how hard it is to go against this apparent normality.

For example, when my son was at infant school I would sometimes pick him up at the end of the day. The parents would gradually gather next to the playground gate, but we were not supposed to go through until five minutes before the home-time bell rang. With only a few people by the gate, someone would notice the time and open the gate. But there was a critical number of waiting people. When the group was larger than this, no-one was willing to make the first move. Numbers built up further outside the gate, people looked at their watches, but no-one went in. Often it was only when the school bell rang that someone at the front of the throng of parents felt that they now had permission to open the gate.

Think of this as a kind of herd instinct. When we see people walking past a prone body in the street, we are inclined to keep walking too. When depressed people read about a suicide in the paper, they are more inclined to kill themselves too. When people see TV adverts for fast-food restaurants, they are more inclined to eat there, not because their attitude to the product itself changes, but because they regard eating there as more normal. As you might expect from the phenomenal sums spent on advertising, seeing people on TV is just as effective as seeing them in real life.

People can be prompted into desirable behaviour by making it seem normal. They can also be accidentally prompted into undesirable behaviour by chastising messages saying how bad it is. "Look at all the people who are doing this bad thing," says the message. But what people hear is "This is normal. You can do it too." Cialdini gives an example of one of his graduate students who stopped at the Petrified Forest National Park in Arizona with his fiancée. Because so many visitors had been stealing pieces of petrified wood, the park had put up a large sign by the entrance, which said "Your heritage is being vandalised every day by theft losses of petrified wood of 14 tons a year, mostly a small piece at a time."

The graduate student recounted how he was shocked when they read the sign at the entrance and his fiancée — who he described as the most honest person he had ever known — nudged him with her elbow and whispered in his ear "We'd better get ours now." By making it clear that the thefts were frequent, the sign had inadvertently made it seem that they were normal.

Subsequently, Cialdini organised experiments which showed that bad signs like the one by the entrance really do increase theft (by a factor of 3 in their study). They also tried signs that marginalised theft, saying "If even one person steals, it undermines the integrity of the forest." Those signs halved the rate of theft. The moral of this story is to be careful when expressing concern about a problem.

Don't do it in a way that makes it seem frequent, common and normal.

Two factors make social proof especially powerful. Firstly, when the situation is uncertain, and people are confused about how to act they rely on others for reassurance. Is the man on the pavement drunk, or is he having a heart-attack? What do other people think? In a clear-cut emergency, people are eager to help, even to risk their lives. If they are not sure, and they see others doing nothing, they will hang back. The second factor is similarity: people are most influenced by social proof from people similar to themselves. (A clear link here to the previous category, liking.)

Looking at the jewelry shop scam, we can see some clear examples of social proof. When Tracey is arrested, she is open-mouthed with surprise. The assistants are very surprised and the situation is very uncertain. However, Tracey has already established that she is likable, so when she accepts the policeman's story, this is strong social proof that the assistants should accept it too. She lets the second policeman take her away from the counter and put her in handcuffs. She looks glum and resigned. Her role now is to offer social proof that the story told by the policeman at the counter really is true.

Social proof is often used in scams. The people obviously working the scam are often surrounded by a supporting cast of "shills" who appear to be innocent members of the public. Their rôle is initially to draw in the "mark" using social proof by showing interest and enthusiasm for the scam. After the central part of the scam is over, and the mark has been separated from their money, the shills perform damage-control by "cooling off the mark." They offer social proof that the mark shouldn't attempt to recover their money, that they shouldn't call the police, that they should just let it go. **The scam is often bigger than it seems** and social proof is a vital part of it.

How can we defend ourselves against social proof tricks? When you know what to look for, you can easily see attempts at social proof in advertising. They are as easy to spot as canned-laughter backing-tracks to cheap sitcoms. Once we notice, they still have some influence on us, but it's as much annoying as convincing. However, with well prepared scams like the jewelry shop scam, you are unlikely to notice the shills until the scam is over, and maybe not even then.

Those are Cialdini's six categories of influence: reciprocity, scarcity, authority, commitment, liking and social proof. But if you have been keeping count of the corresponding moral values, you'll have noticed that there should be at least one more category, corresponding to purity/sanctity. Did Cialdini miss one? I think he did, because he was concentrating exclusively on legitimate influence techniques, not illegal scams.

I think we should call this new category **contamination**. This is the principle that people tend to avoid things that make them feel contaminated, and if they do feel contaminated they want to conceal it from others. I'm reassured that this

really is a category of tricks by recent work from security expert Frank Stajano and Paul Wilson, co-presenter of *The Real Hustle*. (He plays the second policeman in the jewelry shop scam). They have constructed another taxonomy of scams, related to but different from Cialdini's and not based on moral values. They call one of their categories "the dishonesty principle," but it's essentially what I am calling contamination.

It's a routine part of many scams that the mark is tempted into doing something which is dishonest. For example, they might be lured into buying something from a man in a pub which "fell off the back of a lorry." There's a tacit understanding that really it's been stolen, but out of politeness, nobody says that explicitly. It's too good a deal to resist, so the cash changes hands. The operator of the scam leaves and when the mark gets a chance to look at his purchase, it's not what he saw earlier. He's been duped. He feels angry, but also embarrassed, dirty. He knew that he was being dishonest. Is he going to tell the police? No.

We see a contamination trick being used in the jewelry shop scam. Tracey counts out her money onto the counter in a rather unusual way, in several separate piles of notes. When she is finished the money is all over the counter. The policeman then pounces and announces that this is counterfeit money — even though it looks real, it's contaminated and *it's all over the counter*. But now it's evidence, and the policeman starts to gather it up. Unfortunately, the necklace is also evidence — so it's contaminated too. The assistant holds it gingerly between finger and thumb, dropping it into the evidence bag at arms length. In a way, she's relieved that the nice policeman is decontaminating her shop.

So, contamination is an important category of tricks. Are there any more? I suggested in an earlier chapter that by analogy with the corresponding emotions there could be two more moral values, which I called wonder/curiosity and loving-kindness. Are there tricks based on these other moral values?

I think that tricks based on loving-kindness are used everyday by beggars and sometimes by salesmen. They are so obvious that Cialdini didn't think it worth mentioning them. Let's call this category **distress**. You see a beggar with a moth-eaten dog, you put your hand in your pocket and leave them some change, or you feel guilty that you should have done so. You meet a salesman who seems down on their luck, and you buy something you don't really want. But were they really needy, or just faking it? This fraudulent appeal to charity is so commonplace that we have to take a moment to realise that just asking can still be a trick. (Is it really based on loving-kindness? That makes my classification look neater, but you could argue that maybe it has more to do with harm/care.)

I'm also happy to suggest that there should be another category which I will call **mystery**, based on wonder/curiosity. This is the principle that people just can't resist looking in a forbidden place to see what's there. This is over and above feelings of greed and envy. After all, greed is just a misplaced sense of fair-

ness/reciprocity — in a fair world I would have more stuff. Similarly with envy, in a fair world I would have that stuff, not you. With wonder/curiosity we are driven to look inside the box without any expectation of profit. We don't know whether it's good or bad. Yet it's hard to resist, isn't it?

How many stories revolve around forbidden secrets? The heroine is told, "You can go anywhere else, but don't open that locked door." Or an old guy in a beard says to the hero, "Look at this garden. I've planted all kinds of trees. You can eat the fruit of all of them except that one there. Don't eat that." Or someone gives our heroine a box and says, "Under no circumstances are you to open this." We know what happens.

A report by the British Office of Fair Trading gives an example of someone tempted into an e-mail scam by curiosity:

"Every other day, I got it through and I used to delete it and then I was just sitting there and I thought 'Oh, I'll just do it this time and I'll see what it's all about and...'"

Researcher: "So almost like curiosity."

Interviewee: "It probably was curiosity, just to see what actually happened, because I kept getting it through and through, for ages and ages and ages."

Cialdini explains the value given to censored or banned material in terms of the scarcity principle. And yet, as he says:

The intriguing finding about the effects of censored information on an audience is not that audience members want to have the information more than before; that seems natural. Rather it is that they come to believe in the information more, even though they haven't received it.

In some ways this sounds more like mystery than scarcity. To use mystery as part of a scam, the operator could deliberately arrange for something to be forbidden so as to tempt the mark. Cialdini lends some support to this idea, saying:

The worrisome possibility is that especially clever individuals holding a weak or unpopular position on an issue can get us to agree with that position by arranging to have their message restricted. The irony is that for such people — members of fringe political groups, for example — the most effective strategy may not be to publicise their unpopular views but to get those views officially censored and then to publicise the censorship.

So, I think there are tricks based on mystery, but they are much rarer in practice than the others.

The key lesson from all these tricks is to notice that they work at all levels from small-scale scams to national governments, from door-to-door salesmen to international advertising campaigns. It seems to be an open question whether they work on psychopaths. From first principles we would expect that only commitment and social proof would have a significant effect on them, because those two categories of tricks are not founded on moral values and emotion in the same way as the others. However, I'm not aware of any research which would resolve the question.

Chapter 5

Science

Let's go back to Dartmoor, to the Sherlock Holmes story *Silver Blaze*. Remember when inspector Gregory showed Holmes and Watson the scene of the murder? Holmes found a small but telling piece of evidence that the police had overlooked. He then told Gregory that he would need a little more time to look around. Holmes wasn't being entirely candid. He needed more time, but not to look at the murder site. He needed more time to find the missing horse.

I said previously that Holmes and Watson search for the horse using the "scientific method." What did I mean? Look around you. I'm confident that almost everything you see is a product of science and its brother-in-arms, technology. In other words, a product of the "scientific method." You rely on it every day. But can you explain it? Can you apply it yourself to your own problems? Science is the ultimate hack, the hack that can generate every other hack. How does it do that?

The usual explanation of the scientific method is that it consists of **hypothesis** and **experiment**. We see this clearly in the Sherlock Holmes story. The ground near the murder site was quite dry and hard. Gregory had searched for tracks but found none. Which way had the horse gone? Holmes applies his imagination to the problem. "See the value of imagination," says Holmes. "It is the one quality which Gregory lacks." Holmes looks at the rolling brown landscape and he imagines the horse running off on its own. Which direction seems most plausible? In the scientific method this imaginative step is the hypothesis. It's a hunch, an unproved speculation. The next step is to prove it true or false. We need an experiment.

Holmes and Watson set off across the moor, following the path of their imaginary horse. If the hypothesis is correct, they might find evidence to confirm it. They walk away from the murder site, far beyond the ground searched by the police. They come to a depression in the moor. Today the ground is baked hard by the summer sunshine, but on the night of the murder rain was streaming down. This ground would have been soft and muddy. They cast around and soon find hoof-prints. Holmes checks one of the hoof-prints against one of Silver Blaze's horseshoes, given to him earlier by Gregory. The horseshoe matches. The experiment has proved the hypothesis. "We imagined what might have happened," says Holmes, "acted upon the supposition, and find ourselves justified." A triumph for the scientific method.

Hypothesis and experiment. Is that it? Where exactly is the hack? Is it in Holmes' special powers of imagination? But then how can we learn to do that for ourselves? What if we are not as special as Holmes? Or maybe the key is looking at things? But that seems rather mundane, doesn't it? Surely there's more to science than lucky guesses and looking to see the if guesses are right? Well, there is more to science than that, and I'm going to explain it to you, but first it's important to realise that even scientists often don't realise how science works. They can be good at doing science without knowing how it works or why it works. Instead they often believe in a distorted image, a caricature of science. There are two especially popular distorted images of science. As scientific historian Simon Schaffer explains:

One image is that scientists are absolutely special people; that they're much more moral and much more virtuous and much much cleverer and that they do things *nothing like* what anybody else does. On the other hand, there's an equally powerful public image of science, which is that science is organised commonsense, that it's just cookery raised to a fairly sophisticated art. Those are the two dominant public images of science in our culture, and neither of them is right.

Schaffer and his colleagues in the "Science Studies" movement came to this conclusion after studying scientists in their natural habitat. They wanted to know how science really worked, what scientists really did in their day-to-day lives. So they took the methods invented to study tribes in New Guinea and used them to study scientists in research labs. They went back and looked again at historic discoveries. What did scientists actually say and write beforehand? What really happened?

Outsiders studying science had previously just asked scientists what they did and assumed that their reminiscences were accurate. They hadn't actually been to look, to see what really happened in practice in laboratories and field stations. When they did look, they discovered that the reality was quite different from the two views of science described by Schaffer, views very popular with the scientists themselves.

You might imagine that scientists would be pleased to know how science really worked. But no. Instead, for most of the 1990s, the supporters of those two popular images of science attacked the historians and anthropologists who were studying them. This feud became known as "the science wars." As Schaffer recalls with a lingering bitterness:

It was a very unpleasant period indeed. Several of my friends either lost their jobs or were threatened with losing their jobs, on the grounds that they were the enemies of the sciences.

The main thought-crime of the historians and anthropologists was to suggest that science was “socially constructed.” This really touched a nerve. The self-appointed defenders of science said that something was either true or it was socially constructed. It couldn’t be both. Science was all about objective truth. People who suggested that there was a social aspect to science must therefore be Post Modernist wreckers. They must be denying the reality of objective truth. Schaffer and his colleagues were denounced as “constructivists.” This was especially ironic because they were self-consciously trying to be scientific in their investigation of science, trying to draw conclusions based on real-world observation.

Schaffer’s particular sin was to have written, with Steven Shapin, a book about science in seventeenth century England. In *Leviathan and the Air-Pump* they investigated a long-forgotten controversy, an argument which started in 1660 between Robert Boyle and Thomas Hobbes. Most likely, the argument was forgotten because Thomas Hobbes, political theorist *par excellence*, was on the wrong side, the losing side. He argued against Boyle’s experimental method, the method which became the cornerstone of modern science. However, by putting the argument in its historical context, Shapin and Schaffer demonstrated that Hobbes’ concerns were entirely valid at the time. And not only that, Hobbes’ old objections raised disturbing questions about the two popular modern-day images of science.

Here is the story of Boyle and Hobbes in a nutshell. Boyle was a wealthy aristocrat, a gentleman with a keen interest in science. He is today regarded as the “father of modern chemistry.” In 1660, he published a book describing experiments with an “air-pump,” a device for removing the air from a container, leaving a vacuum. At the time there were only a handful of air-pumps in the whole of Europe. Boyle’s air-pump had been constructed with help from his talented friend Robert Hooke, and in fact Boyle often left the operation of the temperamental air-pump in Hooke’s reliable hands.

The air-pump was central to Boyle’s new idea of how to plumb the mysteries of nature. Before that time, natural philosophers had tried to understand nature by looking at what usually happened when things were left in their natural state. Boyle had the novel idea of interfering with nature using a specially constructed engine, to see what happened when nature was pushed into an extraordinary state. Schaffer says that Boyle’s genius was to realise that “if you want to know about the properties of something, it’s a *really* good idea to get rid of it, and then see what difference that makes.” The idea seems obvious to us now, but it was brand new then.

Boyle put all kinds of things in the air-pump. He found that removing air had the effect of extinguishing flames, and also of extinguishing the life of animals. This seems to us rather cruel and pointless, but Boyle was trying to resolve a current scientific mystery. Thirty years before, William Harvey had published his findings about the circulation of the blood in animals. Harvey demonstrated that the blood

was pumped, again and again, around the body and though the surface of the lungs. But why? Something happened in the lungs and Boyle was attempting to find out what.

But Boyle was attempting to do more than this. He put forward his new method of “experimental philosophy” as the best way to find out the truth and to resolve disputes without conflict. This sounds reasonable enough, but at the time these were big claims. In Europe, the appallingly destructive Thirty Years War had ended only a decade or so earlier. The English had shockingly executed their own king Charles I at about the same time, the culmination of the English Civil War. This was followed in England by a humourless military dictatorship under Oliver Cromwell, who even banned carols and mince pies at Christmas. Only in 1660 was England restored to a version of the previous order when king Charles II was crowned king. In a seventeenth century version of “truth and reconciliation,” the new king gave an amnesty to all participants in the Civil War, with the understandable exception of the few men who had signed his father’s death warrant.

In this context, Boyle’s claim that “experimental philosophy” could resolve disputes without conflict was a big one. How was this supposed to work? Boyle’s method was to perform his experiments in front of respectable witnesses, in a sense in public. When they saw what happened, they would agree on what they had seen and Boyle would write it up in a style that allowed his readers to imagine in their mind’s eye that they had also been “in the room” and seen the same thing. The respectable witnesses who really were in the room would then back up Boyle’s testimony in writing.

In this way, Boyle’s readers could be assured that the experimental observations were authentic. They could be confident that, if they accepted Boyle’s invitation to repeat an experiment themselves, they would see the same thing. By following this process, Boyle considered that the observations he made were established afterwards as “a matter of fact.” Even though in practice almost nobody could repeat his experiments, due to expense and technical difficulty, nevertheless they could rely on these “matters of fact” and use them to deduce the general rules of the natural world. Not only that, said Boyle, but the same method could be used to settle wider disputes, because it was a general method for establishing undeniable truth and allowing people to reason about the world without resorting to violence. Hobbes thought this was complete nonsense.

Born in the year of the Spanish Armada, Thomas Hobbes was in his seventies in 1660. He had seen the disasters which had fallen upon Europe in his lifetime, the consequences of disputes resolved with a lot of violence. He was as keen as Boyle to find a way of resolving disputes without violence. Today he is best known for his theories of government, which still underpin western political thought. In his own lifetime he was renowned for his wider scholarship in the sciences and arts.

He also had a reputation as a bit of a heretic, perhaps even an atheist. (Despite this, the new king Charles II had a soft spot for Hobbes, who had once been his maths tutor, and gave Hobbes a pension.)

Hobbes had two objections to Boyle's "experimental philosophy." Firstly, he said that Boyle was wrong to say people would agree just because they were shown something. Hobbes said that in his own experience, when people really had something at stake then they wouldn't agree. Merely showing them something wasn't enough to make them change their minds. Boyle's method could not compel agreement, so Boyle was wrong to claim that it would guarantee agreement.

Secondly, Hobbes said Boyle was wrong to claim that an experiment done on one occasion in one place could ever prove a general rule. Even if the witnesses did agree about what they saw, one experiment only proved what happened there, not everywhere. Experiments, even repeated experiments, could not compel agreement about a general rule, because a dissenter could say "Show me it happening everywhere. I saw it here and there, but not everywhere. That doesn't prove the general rule." Again, said Hobbes, Boyle was exaggerating the power of his method when he claimed that it could establish undeniable truth.

Hobbes was not making these arguments fresh for himself, but rather echoing two thousand years of philosophical objections to observational science. Hobbes was steeped in classical learning. (For example, he made the first translation into English of the *History of the Peloponnesian War* by Thucydides.) He knew all the old arguments, and he was just wheeling them out against a new opponent.

The classical, Platonic, view of reality was that there were two worlds. The visible world was more or less an illusion, fickle, dynamic, in flux, but behind this there stood a logical, non-material unchanging reality. For example, a particular oak tree might change from day to day, from season to season, never quite the same. But behind it there was an unchanging ideal oak tree, always the same. In this classical view, the route to knowledge must necessarily turn away from the deceptive physical world and instead focus on the logical reality behind the scenes. Hobbes thought that pure logical argument was the only reliable path to true knowledge, as demonstrated for example in the classical mathematics textbooks of Euclid.

It's difficult for us to send our minds back to the time of Boyle and Hobbes. We can see that Hobbes and the classical philosophers made an enormous hidden assumption that human intellect runs parallel to the hidden logical reality, without any physical link between them. They assumed that general rules can be simply recalled to mind, because the mind is itself part of the ideal, behind-the-scenes reality. We find that hard to believe. We take Boyle's experimental method for granted. It seems obviously the right way to establish the truth.

Shapin and Schaffer tried to tell the story even-handedly, and for doing so they were vilified as being "anti-science." Although we don't agree with Hobbes' classi-

cal philosophy, his objections are very substantial, and we can't discount them just because science had such triumphs in the following centuries. Hobbes' objections *do* undermine the foundations of science, so we can't just brush them off. We must have answers, and when we do have answers we will understand how science, the ultimate hack, really works.

Let's start with Hobbes' first objection. Why should witnesses agree? And even if they do agree with each other, why should we agree with them? Boyle was eager to emphasise that his experiments were done in public, not furtively in secret like an old-time alchemist. Hobbes pointedly asked whether anyone could come and watch, knowing full well that that the answer was "no." They were not actually done *in* public, but rather in front of *a* public, constituted from Boyle's friends in the Royal Society.

The Royal Society, the oldest scientific society in the world, was established under the patronage of the new king Charles II. It was self-consciously modelled after the fictional national college of science in *The New Atlantis*, a science-fiction book written 40 years earlier by former Lord Chancellor Francis Bacon. In the book and in reality, this college had a wider political role, pursuing scientific discovery not just for its own sake but also for the benefit of society. But such noble aims did not change the fact that it was in practice a gentleman's club. The Royal Society has been described as open to the public in the same sense that the Ritz Hotel is open to the public. You were quite welcome, provided you looked respectable and had enough money.

So, if you couldn't go and watch for yourself, you would have to rely on the accounts of these gentlemen. But as we have already seen, and Hobbes would be keen to remind us, people make very unreliable witnesses. They are easily fooled and even when they see the same thing, they don't recall the same thing afterwards. Why believe them?

The answer is reputation — or in other words, our moral value of authority/respect. James Boyle and his witnesses "in the room" could be believed because they were gentlemen. Why would Boyle, son of the Earl of Cork, lie about his air-pump? And why would his gentlemen friends support him if he lied? They had reputations to preserve. Hobbes found this answer very unsatisfactory, and never accepted it as a reliable foundation for establishing truth. Despite that, it really is our modern answer to Hobbes' first objection. Truth in science is "socially constructed" in the sense that scientists have constructed a communal system for reputation management. This system is very much founded on the moral value of authority/respect.

Most people think that scientists are unusually sceptical, that they take nothing for granted, that they insist on everything being proved to them. Nothing could be further from the truth. When the anthropologists went to the research labs and studied scientists at work they discovered that the key feature of science was the

tremendous amount of trust. Scientists use equipment made by other people, and they trust that it is calibrated correctly. They use materials made by other people, and trust that they are formulated correctly. They use data gathered by other people and trust that they have been collected correctly. This tremendous amount of trust is for the most part warranted, because of the largely unnoticed social system for reputation management. Scientists have developed a social process for calibrating not just their laboratory equipment but the trustworthiness of other scientists, and then relying on that trust to support work over decades of time and thousands of miles of space. Science works because scientists continually recalibrate their trust for each other.

How does this work in practice? Scientists working in the same field of course know each other, gossip about each other. They also publish their work in journals and at conferences, just as the early members of the Royal Society published their findings and theories. They have reputations to build and to preserve. They adopt a style of writing that takes care to acknowledge previous work, to establish that they know and respect those who trod their path before them. Mistakes are embarrassing, so people try hard to remove sources of error from their experiments. Rather than rely on personal observation, they prefer to build experimental engines that make measurements automatically. Scientists are determined at all costs to avoid the perception of fraud. Mistakes are understandable, but outright lying is a mortal sin. So, the truths established by science are objective, but this system of reputation management means that they are still “socially constructed.”

This social system of reputation management works excellently most of the time. Scientists make much faster progress when they don't have to check everything for themselves. Instead they can plug into the network of trust and build on a pretty solid foundation. If you want to work effectively in a scientific field, you also need to plug into this network, or at least be aware that it exists. As a hacker, of course, your own reputation in this network will be close to zero. However, as an outsider, you can still use the scientific network of trust. When you read someone's work, ask yourself first of all, what's their reputation? Is it flaky? Reliable? Reactionary? Who are their friends? Their rivals?

Hobbes was right to be worried whether the witnesses to an experiment were disinterested observers, whether they would act like gentlemen. Scientists are not special people, they are not morally superior. As a society, we rely on their network of trust just as much as the scientists themselves, and the price of science is constant vigilance. Because of the network of trust, the results of science are mostly trustworthy. But not always. Do we really trust experiments run by drug companies? No, not entirely, not when they can decide what to publish and what to withhold. Do we really trust the claims of GM crop manufacturers? No, not entirely, not when they can veto the publication of unfavourable trials. Often nowadays we see medical scientists selling their reputations for money when they

put their names to biased articles ghost-written by drug companies. Sometimes we even see scientists attempting to crush weaker rivals through the network of trust, undermining their reputations rather than disproving their theories.

Since you are more likely to be on the outside of a scientific network of trust than on the inside, what can you do to establish the truth for yourself if you are dubious about the scientists' conclusions? If you can, the best thing would be to understand the technical arguments and establish for yourself whether their data justify their conclusions. We will come back to this approach later, when we address Hobbes' second objection. However, the problem with understanding the technical arguments fully is that it might take a very long time. It might take years. Are there any techniques to triangulate on the truth from a distance, by using information from the network of trust?

Legal scholar Eric Johnson has made some useful suggestions in his article *The Black Hole Case: The Injunction against the end of the world*. This article deals with legal and scientific arguments about the safety of the Large Hadron Collider (LHC) at CERN on the Swiss-French border. This is one of the largest scientific programmes in history, with a staff of around 10,000 scientists and a construction budget of at least 10 billion Euros. It is an amazing scientific engine, a very distant descendant of Boyle's air-pump. The snag is that it has a small chance of destroying the whole world. How small depends on the precise details of the particle physics theories which the LHC is itself designed to investigate. Only the insiders at CERN are in a position to really know what the risks are.

They said that it was entirely safe, but outsiders challenged this claim and attempted to get court injunctions to stop the LHC being operated. There was a lot at stake. On one hand, the whole world; on the other hand, the future of all the physicists at CERN. While it was not likely that the LHC would destroy the world, it was certain that if the LHC was stopped, all those physicists would be out of a job. This led to some rather intemperate remarks. For example, physicist Brian Cox said "Anyone who thinks the LHC will destroy the world is a twat." I hardly have to point out that this is not a scientific argument, but a reputational attack.

Johnson's article uses the LHC as an example, but he is really more interested in exploring how courts might deal with similar "end of the world" cases in the future. In that future case, whether it be nanotechnology, asteroid mining or whatever, how could a court break a log-jam of self-interested experts and how could it deal with arguments that were too technical to properly understand? Johnson suggests that we look for the following four defects:

- **Defective theoretical groundings.** Sometimes, scientists think they know the answer, but their answer is wrong. A theory which seems obviously true in one era may look hopelessly naïve in another. We should be especially dubious when insiders change their argument again and again in the face

of contrary evidence, so that they can maintain their original conclusions. In the case of the LHC, the claims about its safety were suspect precisely because insiders were forced to change their argument several times as flaws were exposed.

- **Faulty technical work.** When scientists need to draw extraordinarily reliable conclusions, they need to rely on extraordinarily careful work by other scientists. However, the network of trust might fail — those other scientists might not have taken extraordinary care in their work, because they didn't expect that much would depend on it. The other work might contain small-scale errors, such as miscalculations, inaccurate observations or flawed assumptions. As outsiders, we might still be able to check, or estimate, whether enough care was taken in subsidiary work. As outsiders we can also consider how many assumptions were needed to draw the conclusions: more assumptions means more room for error. The safety arguments for the LHC not only made a lot of assumptions, but depended on observations of a handful of stars made by other scientists. It is unlikely that the scientists observing those stars took *extraordinary* care with their observations, since they could not know that the fate of the world might depend on them.
- **Credulity and neglect.** We have already seen many factors that can lead to groups of people making innocent and unintentional mistakes. For example, people see what they expect to see, and suffer from confirmation bias. “Reputational cascades” endow conclusions with more and more confidence each time they are passed on. Moral arguments can override logical thinking. Ingroup/loyalty in particular leads to “groupthink,” where group members value consensus over truth. As outsiders we can see some of these effects more clearly than insiders. Hostility to outsiders, such as Brian Cox's remark about critics of the LHC, is a bad sign.
- **Bias and influence.** The final defect is that people can deliberately make errors, because of self-interest and ambition. As outsiders we can try to use the network of trust in reverse, to find conflicts of interest. We might not have to look far. The defenders of the LHC had numerous conflicts of interest. Insiders may also be prone to hopeless resignation: they may conclude that they are powerless to change things, despite being convinced that things are wrong. Or they might decide that if they succeed it will be just as bad for them — the whistle-blower is usually punished by those who have lost out, even when they do succeed in changing things. We cannot, as outsiders, rely on the absence of whistle-blowers to prove that all is well on the inside.

Science has been so successful, has expanded so much, that other institutions now use science's cloak of respectability to further their own aims. This dishonesty is not lost on the public, and perhaps explains the current public disillusionment with science as a whole. It looks to the public as if some of these "gentleman" scientists have sold out. Which they have. But this disillusionment is short-sighted — we need science now more than ever, and rather than turning our backs on it, we need to revitalise the network of trust that makes science work. We need to disentangle money and truth. We need to make coercion, bribery and bias more obvious — libel lawsuits and copyright injunctions have no place in the conduct of science. But perhaps most of all we need to understand the limits of science. We need to understand that scientists are not the high priests of truth and that the results of science are always uncertain and provisional. Which brings us back to Hobbes' second objection.

Hobbes said that no single experiment or even a series of experiments could establish the truth of a general rule. You can prove a fact true using an experiment, but it's harder, usually impossible, to prove a general rule using an experiment. For example, Holmes conjectured that the horse Silver Blaze was at a particular place nearby on Dartmoor. Holmes and Watson then conducted an experiment. They found hoof-prints and then they found the horse. They could prove their conjecture because it wasn't a general rule, it was a hypothetical fact. They just had to demonstrate that it was actually a true fact.

While they were doing this, inspector Gregory remained unaware of what they had found, and still believed in the general rule "Silver Blaze is absent from every place on Dartmoor." Gregory had looked in several places on the moor around the murder site. He hadn't found hoof-prints and he hadn't found the horse, so he concluded that Silver Blaze was not anywhere on the moor. We can clearly see in this case that he was wrong. The essence of Hobbes' objection is that all arguments of this kind are wrong. Unless you look *everywhere*, and establish the facts about *everywhere* by observation, then you haven't proved a general rule which claims that something is true *everywhere*.

The technique of looking everywhere is more practical these days than it was in Hobbes' time, and we do sometimes use it in practice. Computer hackers call this technique "exhaustive search." You need a problem where a computer can do all the experiments for you, and do them in a sufficiently short time. Before computers, most forms of exhaustive search were impractical. Even now, most general rules are not candidates for exhaustive search, so the only way to prove a new general rule using logical argument is to derive it from an existing general rule which you already know to be true. Hobbes was right.

This fatal flaw in the experimental method didn't kill science in the seventeenth century. Science was inventing useful new general rules. People not only understood more about the world, they were making money. Hobbes' objections were

forgotten. Science continued for several hundred years, like one of those cartoon characters running off the edge of a cliff, not noticing that they are supported only by air. Finally, in the twentieth century, the embarrassment grew too much, and some attempts were made to underpin the enterprise with more respectable logical foundations.

The best known attempt from the mid-twentieth century was made by philosopher Karl Popper. Popper's idea of **falsifiability** is still considered the acid-test of whether a theory is properly scientific. Popper said that to count as scientific, a theory had to be "falsifiable." By this, he meant that it wasn't important that a theory couldn't be proved by an experiment, provided that in principle it could be *disproved* if it was wrong. So Inspector Gregory's theory that "Silver Blaze is absent from every place on Dartmoor" is perfectly scientific. It's just that it's wrong. Holmes falsifies the theory by finding the horse.

Popper's idea has a sort of Darwinian flavour to it. People create many theories to explain the world. People attempt to disprove the theories by experiment. Most theories are falsified. A few remain. The remaining theories are accepted provisionally. It's a sort of "survival of the most plausible," but no surviving theory is actually proved true. Falsifiability has been a popular idea, but it has some subtle problems. When experiment goes against theory, it is seldom clear exactly which part of a theory is wrong. Popper thought that it was better to drop the complex parts of a theory and keep the simpler, more general parts. This corresponds to the medieval idea of Occam's Razor, the principle that simple, general explanations are to be preferred over complex, specific explanations. The best theory is a simple theory that explains a lot. But why? Popper could not bring himself to say that simple, general theories are more likely. Popper agreed with Hobbes that although disproved theories are false, the other surviving theories are no more true than they were on the day we first thought of them. How could a theory be more likely and yet no more true? There seems to be a paradox here.

Happily, we now know the answer. There is no paradox. But the answer wasn't accepted easily by scientists. In a curious parallel with the "science wars" fought by historians and anthropologists, the mathematicians and physicists who invented the new logical foundations for science had to fight to have their ideas accepted. The fight was at times very acrimonious. Although the key work had been done in the 1940s and 1950s by Harold Jeffries, Richard Cox, Claude Shannon and George Pólya, the fight ground on through to the 1990s.

The solution was to redefine what we mean by the terms "true" and "prove." This was the step which many scientists found unpalatable. A sequence of confirming experiments does not make a theory any more true using standard logical arguments. But suppose you were a bookmaker, taking bets on the outcome of the next experiment. What odds would you offer? As each experiment failed to disprove the theory, I think you would be happy to offer longer and longer odds

on the next one disproving it. In the rather strange sense of changing the odds for bets on the theory, confirmatory experiments *do* make the theory more and more true. For a long time, this approach, called **Bayesian reasoning**, was regarded with deep suspicion. In recent years, the idea of using betting odds for reasoning rather than the true and false of classical logic has finally become respectable.

Bayesian reasoning contains the earlier classical logic as a special case, the case where we know that something is absolutely true or absolutely false. Bayesian reasoning can also work with facts and general rules which are not completely certain. Given the odds for each fact and general rule, Bayesian reasoning can combine them and calculate the odds for our conclusion. That conclusion is still uncertain, but we are able to put a precise number to that uncertainty. For example, we might establish that the odds of a particular conclusion being wrong are 1 in 1000. Depending on what is at stake, we might decide that we have effectively “proved” that conclusion and that it is “true.” True enough, that is, for us to make a decision, true enough to place a bet, but not true in a sense that would really satisfy Hobbes or Popper.

Thick textbooks have been written about Bayesian reasoning, but don’t worry. I’ll show you how Bayesian reasoning works in only a few pages. Let’s start with a problem that Hobbes or Boyle might have met in a London coffee-house in 1660, the problem of how much to charge for marine insurance. Let’s say the owner of a ship comes to you and wants to buy insurance for their next voyage. Most ships return safely, but there are some losses from storms and piracy. The owner essentially wants to place a bet that their own ship will be lost, as a hedge against that disaster. How do you set the odds?

Let’s use the standard hacker’s technique of first solving a problem which is related but simpler. The insurance problem is a bit like being a bookmaker in a gambling game where you can’t quite see the operation of the game. For example, suppose you have a friend who is playing a gambling game on the other side of the coffee house. We’ll let him call out to you the results of each game. When your friend wins, he calls out “one,” when he loses he calls out “nought.” Here is what he calls out in sixty games:

010011001101011000110100001100011001111111001000111011111110

Now, say someone comes to you and wants to place a side-bet on your friend. What odds should you set? What’s the chance that he will win his next game? The data look quite random. (There are a couple of runs of seven ones in a row, but this exactly the sort of thing you expect from time to time in truly random data.) Out of 60 games, he won 33. So, your best estimate for his chance of winning is 33 in 60. You can’t expect to have exactly the right odds, and you would need a lot more data to come up with a better estimate. To see what difference more data would make, let’s say that we collect the same data every day for a year, and each

day put an “x” against the number of times out of 60 our friend won on that day. Here is a year’s worth of data:

```

15
16
17
18  x
19  x
20  x
21  xx
22  xx
23  xxxxx xx
24  xxxxx xxxxx xx
25  xxxxx xxxxx xxxxx
26  xxxxx xxxxx xxxxx xxxxx
27  xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxx
28  xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
29  xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx x
30  xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx x
31  xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx x
32  xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
33  xxxxx xxxxx xxxxx xxxxx xxxxx
34  xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xx
35  xxxxx xxxxx xxxxx xx
36  xxxxx xxxxx
37  x
38  xxxxx xxx
39  xxxxx
40  xx
41
42  x
43  xx
44
45

```

If you turn the page sideways you get a sort of mountain shape, rising out of a very flat plain. (To save space I left out the lines for less than 15 wins and more than 45 wins. They are all empty.) With this much data we can see that the true odds must be close to 30 in 60, which we might equivalently call 1 in 2, or a probability of $\frac{1}{2}$ or a 50 percent chance of winning. The mountain shape, which we call a **probability distribution**, shows that there is a lot of variation around the **average** of 30 wins each day. To turn a profit we would have to set odds that were slightly more in our favour than 1 in 2, and even then we would risk losing money in the short run if our friend had a winning or a losing streak.

Many probability distributions have this same shape, mountains rising sharply out of a very flat plain. This shape is so ordinary that it is called a **normal** distri-

bution. Extreme events, like 60 wins in a row, are so unlikely that we can ignore them. Collecting data every day, we would still be really surprised to see 60 straight wins even once in the life of the universe. But not all probability distributions rise so sharply from the plains. Some have shallow foot-hills — the so called **long-tail** distributions. Extreme events are much more likely with these distributions. One of the reasons for recent financial disasters is that the financial hackers using computers to place bets on the stock market thought they had normal distributions when in fact they had long-tail distributions. Oops.

So, after that long digression through bookmaking, can we see the answer to our first problem? If you were in a London coffee-house in 1660, how would you work out what to charge for marine insurance? The problem is quite similar. Obviously, you would need to collect and count data on merchant ships. You would need to keep count of ships coming and going, and to find out what happened to the ones you expected that didn't turn up. You would subscribe to a shipping newsletter, or perhaps even pay someone to hang around the Pool of London and keep notes. You could then start to analyse the data more closely. Maybe there's a difference in losses between different kinds of ships, different destinations, or different cargoes? Can you come up with some probability distributions? Based on your data you can make a plausible estimate of the odds that a particular customer's ship won't return.

This is just straightforward book-keeping, but when we calculate odds in more interesting cases, we need to use the rule invented by Thomas Bayes in the eighteenth century. This is usually explained using a complicated-looking mathematical formula, but you can understand and apply Bayes' rule perfectly well without knowing that formula. You only need the formula when you are dealing with very complex situations. In that case you will also need a computer to help you do the calculations. Until then, the method I explain here is entirely adequate and gives accurate results.

To demonstrate the method, let's look at a question posed by psychologist Gerd Gigerenzer. He was trying to see how well medical professionals calculate odds when interpreting the results of medical tests. This is everyday work for these professionals, so when Gigerenzer posed the following question to 160 gynaecologists it was a surprise that they mostly chose the wrong answer. Here's Gigerenzer's question. See how you do.

Assume you conduct breast cancer screening using mammography in a certain region. You know the following information about the women in this region:

- The probability that a woman has breast cancer is 1% (prevalence).

- If a woman has breast cancer, the probability that she tests positive is 90% (sensitivity).
- If a woman does not have breast cancer, the probability that she nevertheless tests positive is 9% (false-positive rate).

A woman tests positive. She wants to know from you whether this means she has breast cancer for sure, or what the chances are. What is the best answer?

- A The probability that she has breast cancer is about 81%
- B Out of 10 women with a positive mammogram, about 9 have breast cancer
- C Out of 10 women with a positive mammogram, about 1 has breast cancer
- D The probability that she has breast cancer is about 1%

Which answer did you pick? (The right answer is ‘C.’) Before Gigerenzer taught his technique to the gynaecologists, they were disturbingly bad at choosing the right answer: only 1 out of 5 of them chose correctly. This is worse than if they had picked their answer at random!

To get the right answer, we first need to understand what the question is telling us. The question gives us the results from some previous surveys. There must have been a survey which counted women in the region, and also counted how many of them had breast cancer. That survey tells us the **prevalence** of breast cancer in this region: the figure is 1% — in other words 1 woman in 100 has breast cancer. We might equivalently say that the **prior probability** of having cancer is 1 in 100, or that the **base-rate** for breast cancer is 1 in 100. All these terms mean the same thing: if you pick one woman out of this region at random, the chance that she currently has breast cancer, not knowing anything more about her, is 1 in 100.

There must have also been another survey looking at breast cancer screening using mammography, to find out how good that test is at finding whether a particular woman actually has cancer. It’s not completely reliable. The results of that survey tell us the **sensitivity** of the test: when women who definitely have cancer are tested, 90% of them test positive — 90 women out of 100. We are not told explicitly, but we are expected to notice for ourselves that this means the test can give the wrong result: that 10 women out of 100 with cancer will nevertheless test *negative*. (The test will give them the all-clear when in fact they have cancer.) That figure — 10 in 100, or 10% — is also called the **false-negative rate**.

Finally, and presumably from the same survey, we have our last piece of data, the **false-positive rate**. This is the chance that the test makes the other kind of mistake, telling healthy women that they have cancer. When women who definitely

do not have cancer are tested, nevertheless 9% of them test positive — 9 women out of 100. For these women, the test will disturbingly say that they have breast cancer when actually they don't. Of course the test usually gives the all-clear for these women: 91 in 100 women without cancer will correctly test negative, just not all 100 of them.

So, if you are a gynaecologist presented with this data about your patient, what do you tell her? Does she have breast cancer for sure? Or what are her chances? Here is the easy way to work out the correct odds. First, don't think directly about odds. Instead, think about a large enough number of people. This might be 1000, it might be 10,000 or more. If your calculations give you nice round numbers of people, you picked a big enough number. If you get annoying fractions of people, choose a bigger group to start with. In this case, it turns out that 1000 women is a large enough group. So, start with this invented group of 1000 typical women, and rephrase the data you were given as smaller sub-groups :

- Out of 1000 women, 10 have cancer. (The prevalence is 1% and 1% of 1000 women is 10 women.)
- Out of those 10 women with cancer, 9 test positive. (The sensitivity is 90% and 90% of 10 women is 9 women.)
- Out of the 990 women without cancer, about 89 nevertheless test positive. (The false-positive rate is 9% and 9% of 990 women is about 89 women.)

It might help you to draw a diagram, showing how the original 1000 women get divided into sub-groups.

1000 women			
10 breast cancer		990 no breast cancer	
9 positive	1 negative	89 positive	901 negative

Now, you are not interested in the women who tested negative — your patient tested positive. Count the women who tested positive: we can see that there are $9 + 89 = 98$ in total who test positive. Now count the women who tested positive and actually have cancer: of the 98 women who tested positive, only 9 actually have

cancer. The rest are false-positives. So as a gynaecologist advising your patient, you should tell her that the chance she has cancer is now 9 in 98 or about 1 in 10.

That's answer 'C' in Gigerenzer's question. Before Gigerenzer taught the gynaecologists how to do this calculation, nearly half of them thought that the best answer was 'B' (9 out of 10). Most of the rest wrongly chose answer 'A' (88%).

A woman who tests positive in this example is still quite unlikely to actually have cancer, but a positive result means that it's a good idea to investigate further, since this risk is likely to be the biggest one facing her right now. Notice that for women who test negative, their odds change in the opposite direction. They go from 1 in 100 before the test to 1 in 902 after the test. They still have a very slim chance of having cancer, but we would be happy to tell them that the test has "proved" that they don't have cancer. Not proved in the old-fashioned sense of course, not in a way that would really satisfy Hobbes or Popper, but proved enough that we can make a decision.

We can use exactly the same techniques to update the odds on the truth of general rules using the evidence from experiments. When we design our experiments, we try to make them as clear as possible, to reduce the chance of both kinds of error. We try to make the false-positive rate as small as possible, close to 0%. We also try to make the false-negative rate as small as possible, close to 0%. (Or equivalently, try to make the sensitivity as big as possible, close to 100%.) We can never do quite as well as this, but provided the sensitivity is bigger than the false-positive rate, any confirmatory experiment must make the general rule more likely.

One really clear experiment can move the odds of a particular general rule from very unlikely to very likely. But the same change in odds can also happen if we apply the results of a long sequence of less clear experiments one after the other. Either way, this is how in Bayesian reasoning a theory becomes more likely and more true through a series of confirmatory experiments.

Bayesian reasoning has been demonstrated to give commonsense answers and has been proved consistent with classical logical arguments when we are dealing with completely true or false statements. So why was there hostility from mainstream science? The biggest problem was probably that in the twentieth century, scientists had adopted a different way of deciding whether experimental results should be accepted. Unfortunately the way they chose was wrong.

Early in the twentieth century, scientists decided that they would say that an experimental result vindicated a theory provided the false-positive rate, which they called the **p-value**, was 5% or less. They called this a **significant** result. They called a p-value of 1% **highly significant**. This special meaning of the word "significant" persists throughout the whole of science. You will find it almost impossible to get the results of an experiment published unless you demonstrate a p-value of less than 5%, regardless of the sensitivity of your experiment. On the other hand, you

will find it relatively straightforward to get your results published if your p-value is less than 5%, again regardless of the sensitivity. Worse than this, most scientists and most of the educated public think that a p-value of 5% means that there is a 5% chance that the theory tested by the experiment is wrong. Or to put it another way, they think that after the experiment the probability of the theory being true is now 95%!

I expect that you find this slightly horrifying. Times *are* changing, and Bayesian reasoning has moved from a fringe belief to mainstream respectability. But journals still use the 5% rule to decide whether to publish new results. Medical researcher John Ioannidis published a scathing article in 2005 with the provocative title *Why Most Published Research Findings Are False*. He pointed out the flaws I just mentioned, but also explained another problem with the 5% rule: when a lot of research groups attempt the same experiment, some of them are bound to get results that appear to confirm their theory, just by accident, when the theory is false.

Negative results are unpopular and hard to publish. So, the many research groups with negative results just file them away and forget them. (This form of **survivor bias** is called the **file-drawer effect**.) The one research group who quite by chance gets a positive result finds it easy to publish this. For a little while after that publication, there is a window of opportunity for another group to publish an oh-no-it-isn't paper — this is the only time a negative result is interesting. So much for Popper's idea of falsifiability.

Clearly, to really judge how much a theory is true we need to use Bayesian reasoning properly, and to use *all the experimental results*, not just the results the journals like to publish. Drug companies are particularly criticised for funding many studies, but only publishing the ones that support sales of their products. Bayesian reasoning can't reach the truth if we don't give it all the data. All it reveals then is our own biased preconceptions. (Ioannidis suggests that published papers in medicine currently tell us much more about the popularity of theories than about their truth.)

I expect that the situation will improve due to the operation of the social mechanisms of science — it has already improved a lot. The network of trust will gradually ensure that scientists who make reliable judgements will be believed more than flaky scientists, and the more reliable methods will become standard. Bayesian reasoning will eventually become the orthodoxy. But until then we have to take care when interpreting scientific results, because they might not mean what people say they mean.

The fundamental strength of science comes from the network of trust. The important thing when inventing a new hypothesis is not the imagination you have yourself, but the imagination you can make in a group of people. The important thing when judging truth is not the truth you reach on your own, but the truth

you establish as a group. When we see this, we can see that science is actually the distilled essence of Western civilisation. Historian Carroll Quigley, writing in his book *The Evolution of Civilizations*, summed up this essence with the somewhat cryptic maxim that that “Truth unfolds in time through a communal process.” Quigley explains this in the following way:

This outlook assumes, first, that there is a truth or goal for man’s activity. Thus it rejects despair, solipsism, scepticism, pessimism and chaos. It implies hope, order, and the existence of a meaningful objective external reality. And it provides the basis for science, religion, and social action as the West has known these.

Second, this attitude assumes that no one, *now*, has the truth in any complete or even adequate way; it must be sought or struggled for. Thus this outlook rejects smugness, complacency, pride, and personal authority in favour of the Christian values and a kind of basic agnosticism (with the implication “We don’t know everything”), as well as the idea of achievement of good through struggle to reach the good. The earliest great work of German literature, *Parzival*, has as its subtitle “The Brave Man Slowly Wise.” This is typical of the Western ideology’s belief that wisdom (or any real achievement) comes as a consequence of personal effort in time. The same idea is to be found in Dante’s *Divine Comedy*, in Shakespeare’s tragedies (taken as a whole), and in Beethoven’s symphonies.

There are two important ideas here: one is that no one has the whole truth now but that it can be approached closer and closer in the future, by vigorous effort, and the other is that no single individual does this or achieves this, but that it must be achieved by a communal effort, by a kind of cooperation in competition in which each individual’s efforts help to correct the errors of others and thus help the development of a consensus that is closer to the truth than the actions of any single individual ever could be. We might call these two aspects the temporal and the social. They are covered in our maxim by the words “unfolds” and “social.”

There is also a third idea here; namely, that the resulting consensus is still not final, although far superior to any earlier or more individual version.

Quigley wrote these words, which seem to perfectly describe the nature of science, in 1961. It makes you wonder why the “science wars” were ever necessary.

Part II

Groups: Organisations and States

Chapter 6

Patterns

Carroll Quigley never intended to become an historian. As a teenager, he was a science geek, interested in rocks and minerals. As an undergraduate at Harvard, he intended to become a biochemist, and in his first year he came top of his calculus and physics classes. But he was forced, in the interests of intellectual breadth, to also study one humanities course. He chose the history course “Europe since the fall of Rome,” and was awarded a ‘C’ grade. Despite this mediocre result, he decided to abandon his previous plans and transfer to the history department. Eventually, he graduated top of his class in history and went on to a PhD at Harvard.

He moved in 1941 to the School of Foreign Service at Georgetown University, where he remained until he retired in 1976. Quigley devoted himself to teaching, and his course “Development of Civilization” was the centrepiece of the Georgetown history department, enthusiastically praised by his students, even years later. Former student Bill Clinton even mentioned Quigley’s inspirational influence in his speech when he accepted the Democratic party nomination for President in 1992. (Clinton had taken Quigley’s class in the 1960s.)

Quigley was both an insider and an outsider. As an insider, he consulted for the State Department, the Department of Defence, the Brookings Institution and other bodies in government or close by. He regarded himself as in the intellectual mainstream of Western civilisation, but at the same time he was an unusual historian, an outsider who attempted to apply the methods of science to the study of history. This meant studying many different periods of history to find common patterns — patterns which were never perfectly developed, but always distorted. Most historians, then and now, prefer to concentrate narrowly on a particular topic in a particular period, so they can be an unchallenged expert on one thing. Breadth is dangerous, because it invites mistakes, and Quigley did make some mistakes. But the patterns he saw are a tremendous help in understanding our history and our world.

To understand any subject deeply, you need to see patterns. You need to have a structure on which to arrange detailed facts. Through all of history some particular patterns of social organisation and national government seem to recur again and again. One pattern noticed by Quigley, which I will call **instruments and institutions** explains why all social organisations tend to degenerate and deviate from

their original purpose over time. Another pattern, **finite and infinite games**, invented by religious scholar James Carse, explains very neatly why the “establishment” elite in any society often makes decisions against the best interests of the society and even against the best interests of the establishment itself. A third pattern, noticed by Quigley, which I will call **aspects of sovereignty**, catalogues the levers of power in a nation and illuminates exactly how some governments have less control than others.

Let’s start with Quigley’s **instruments and institutions**. In his book *The Evolution of Civilizations*, Quigley talks about the various needs of humans living in groups. For example, we might think about the following different human needs:

- Military: for group security.
- Political: to organise inter-personal power relationships.
- Economic: for material wealth.
- Social: for companionship.
- Religious: for psychological certainty.
- Intellectual: for understanding.

Quigley suggests these categories, but doesn’t claim they are “correct” — he’s keen to emphasise that the precise number of categories isn’t important. If you don’t like those categories, feel free to invent your own. The important thing is to notice that in groups of humans, social organisations come into existence to satisfy particular needs. These organisations don’t attempt to satisfy every need; they each concentrate on some particular category. These organisations don’t need to be formal or “official.” They consist mostly of personal relationships, of people working together to get things done. Quigley defines a social **instrument** as an organisation which is satisfying a particular need, its purpose, with relative effectiveness. But over time, all instruments tend to deviate from their original purpose, and become **institutions**. Quigley explains:

An instrument is a social organisation that is fulfilling effectively the purpose for which it arose. An institution is an instrument that has taken on activities and purposes of its own, separate from and different from the purposes for which it was intended. As a consequence, an institution achieves its original purpose with decreasing effectiveness.

This particular pattern is almost a golden rule of history: **all social instruments tend to become institutions**. There are three reasons for this:

- Firstly, an instrument consists of people organised by personal relationships. These relationships and duties are like shards of the original purpose — they can be reassembled into the original purpose, but they also have an extra structure. These relationships and duties become an end in themselves. Most people think only of their own petty concerns, and almost no-one holds the original purpose as their personal day-to-day aim. For example, the purpose of an army is the defence of a society, but hardly anyone in the army has that as their day-to-day aim. Instead, they are concerned with discipline, feeding and paying the troops, training, providing intelligence, entertaining visiting dignitaries, and so on.

Another way to look at this is to notice that an organisation as a whole has a “global” purpose, but individuals in it usually act “locally.” Since Quigley’s time, the business world has realised that this leads to inefficiency, a point demonstrated by the success of books like *The Goal* by Eliyahu Goldratt. (This book is a bizarre combination of a love-story and a textbook on queuing theory. It tells the story of a manufacturing company which escapes from the curse of local optimisation and turns an institution back into an instrument. The heroes of Goldratt’s tale are rebels who break the rules to restore the original purpose of their organisation.)

In a very small organisation, people have a clear idea of the purpose, so it’s less likely to be an institution. Often a big organisation relies on a charismatic leader to maintain a sense of purpose, but when they lose control, leave or die, the organisation can rapidly regenerate into an institution. Managers can try to enforce the original purpose by imposing more rules or central decision-making, but these measures are self-defeating. When rule-books expand, some people follow the letter of the rules, however perverse. Others spend time and energy working around the rules, “to get things done.” Either way, the organisation is inefficient. Central decision-making is just as bad — it takes too long for decisions to go up and down a chain of command and there’s seldom enough information at the centre to make the right decision anyway. Again, the organisation is inefficient.

- Secondly, people in organisations have their own individual goals, quite distinct from the purpose of the organisation. They have human weaknesses and ambitions. They seek their own advantage and seek advancement within the organisation. This takes time and effort which is not then available to fulfil the original purpose of the organisation.

This effect has been observed by others, in particular by historian C. Northcote Parkinson who noted in 1955 that in a bureaucracy “the number of the officials and the quantity of work to be done are not related to each other at all.” Parkinson saw that officials want to multiply subordinates, not rivals,

and officials make work for each other. They want to multiply subordinates because this automatically brings greater importance, pay and prospects for promotion. (Rivals would reduce their prospects for promotion.) Officials make work for each other because of the extra administrative overheads and communication required when a group of people address a single task together.

“Parkinson’s Law” is usually quoted as “work expands to fill the time available for its completion.” This phrase is in the first sentence of his original article, which shows how far most people read. His conclusions were actually more scientific: he also derived a mathematical formula for the rate of growth of a bureaucracy, in the absence of extra real work. This formula usually gives a figure of between 5% and 6% growth per year, a figure which is well-supported by Parkinson’s data for the growth of the British Admiralty and Colonial office in the early twentieth century, at times when the responsibilities of these organisations were constant or declining.

People may also *join* an organisation because of the social opportunities it brings, rather than to help achieve its original purpose. This is illustrated most graphically by the work of terrorism expert Max Abrahms. Building on the “natural systems” model of organisation-theorist Chester Barnard, Abrahms marshals a convincing body of evidence to show that the vast majority of terrorists join terrorist organisations for social reasons, rather than to achieve political ends. So, in our terms, almost all terrorist organisations are institutions rather than instruments of political change. This explains some otherwise puzzling properties of these organisations: they recruit from lonely, alienated young men, rather than from the politically committed; they seek to prolong their own existence regardless of the political consequences, and struggle most fiercely against groups similar to themselves; most of their foot-soldiers and many of their leaders are ignorant or uncertain about their organisation’s political purpose.

Psychopaths are another problem for organisations. Almost by definition, they focus on their own interests, rather than the original purpose of the organisation. They seem to be over-represented in the upper echelons of organisations — although only 1 in 100 of the general population, psychopaths are thought to form a much larger proportion of company executives, perhaps as many as 1 in 10. They show the qualities of confidence and decisiveness admired in leaders, and they have no qualms about shifting the blame for failure or stabbing colleagues in the back.

- Thirdly, times change, and today’s world is not the same as the world that gave birth to an organisation. To continue to achieve its original purpose, an organisation must change to match the world. However, individuals with

“vested-interests” will resist change if they would personally lose out. On the other hand, even people who would personally gain from the change will not be so eager to press for change. This is because of “loss aversion,” which we previously encountered in chapter four. The prospect of a loss is more motivating than the prospect of a gain, when the loss and the gain are of equal size. So individual selfishness tends to favour the status-quo.

Also, in long-lived organisations, old members leave or die, and if the organisation is to survive at all, they must be replaced by new members. However, the new members may not be adequate replacements for the old members — the old members will have tacit knowledge, which even they are unaware of, but which is necessary to achieve the organisation’s original purpose. So any organisation which fails to nurture tacit knowledge will in time become less an instrument and more an institution. The skill to re-create the organisation again in each new generation is itself tacit knowledge. If this is lost, the organisation is doomed to eventually become an institution.

For all these reasons, all social instruments tend sooner or later to become institutions. But when an instrument has changed into an institution, what about the needs it should be addressing? Often those needs will still be pressing on the society. In fact, the society may not be able to persist in its current form unless those needs *are* addressed. Quigley suggests three outcomes:

- **Reform.** The organisation is rearranged so that it is once more an instrument, more-or-less satisfying its proper purpose. Clearly, the vested-interests in the institution will resist this course of action.
- **Circumvention.** The vested-interests of the old institution are left with their privileges intact, but a new instrument is created which fulfils the original purpose. The more foresighted of the vested-interests might notice that the new instrument must necessarily grow and the old institution shrink, so the privileges of the the vested-interests could be at risk in the future. This worry might inspire the vested-interests to resist circumvention more energetically.
- **Reaction.** The vested-interests of the institution prevent either reform or circumvention. The pressing needs are therefore addressed by no-one and the society suffers some change, perhaps a decline or even collapse.

When we look at military history we can find some particularly good examples of instruments turning into institutions. In the Hundred Years War, says Quigley, “the inability of the French knights to analyze their defeats is one of the best examples we have of the reactions of an institutionalized force to weapons innovation.” Faced with longbow-armed common-folk from England and Wales, the French

were unable to register that men of noble blood could be killed from a distance by their social inferiors.

But you don't have to go far to find institutions. Think about schools — what is their purpose, and how well do they really achieve it? Do they really help transform children into self-reliant mature adults? Why not? What are they doing instead? Think about hospitals, police forces, trades unions, charities. All around, you can see instruments and institutions in your own life. Instruments solve problems; institutions perpetuate the problems they should be solving. And all instruments tend to become institutions.

Another way to look at social groups is to think in terms of **finite and infinite games**, an idea proposed by religious scholar James Carse. The simplest definition of a finite game is one that you play to win. For example, football and chess are finite games. By contrast, an infinite game is one that you play to keep the game going. Carse gives an example of an infinite game from his childhood. Near to his house there was an empty double-lot where children would gather and play softball. In the summer, with no school, they would play all day long. Sometimes they would keep score, sometimes not. It was, says Carse, an endless game.

Although infinite games share many of the characteristics of finite games, there are some critical differences. In an infinite game there is some ambiguity about who is or isn't a player and exactly what the rules are. A finite game has definite rules and definite boundaries. The rules are unchangeable, because otherwise there would be no way to tell when someone had lost. For the same reason, in a finite game everyone has to understand and agree where the boundaries are.

Carse explains that an infinite player has the talent to see when someone is about to lose, and is able either to change the rules or otherwise find a way to get that person back into the play. In his childhood softball game, at the end of the summer the Catholic school a few blocks away went back a week early. So each day, in the late afternoon, a stream of high-energy Catholic kids looking to let off steam joined in and nearly broke up their game. Carse recalls how one of the players saved their infinite game. A little kid with a gift for poetic names called the interlopers "Speed," "Ace," "Slugger," "Champ," and so on. The kids, says Carse, were charmed. The infinite game went on — not entirely easily, but it went on.

Infinite games can contain finite games. *The All England Lawn Tennis and Croquet Club* in Wimbledon is an infinite game, but each year's Wimbledon tennis championship is a finite game. Some lunchtimes, I play badminton in an informal club that's been running for years. It's an infinite game. Some days there are twenty people, some days only a couple, and there's a steady turnover from year to year. We play doubles, singles and when there are odd numbers, two-against-one, which is not an official variant of badminton at all.

When you understand the concept, you can easily apply this classification to other social systems. Most religions are infinite games. An army is an infinite

game, but a battle is a finite game. A trading company is an infinite game, and so usually is commerce in general — people like to band together in guilds, cartels and unions to seek their mutual advantage and to “keep the game going.” They resist the efforts of outsiders to shut the game down.

However, not all commerce is an infinite game. Sometimes one firm gets close to a monopoly, then concentrates on removing all remaining competitors by any means available — in other words, winning a finite game. Capitalism is not supposed to work like this — it is supposed to always be an infinite game, but in practice it sometimes becomes a finite game. The only real defence is to have a bigger infinite game called “government regulation,” but of course even that is not infallible. Since money brings political power, someone with enough money might use that power to change the regulations in their favour — again turning an infinite game into a finite game that they can win.

Most political elites or “establishments” can be viewed in terms of infinite games. When you see them this way, it becomes clearer why they take some otherwise strange decisions, harming their society and themselves in the longer run. Although he doesn’t use the term “infinite game,” Quigley gives a good example from the the Roman republic in his book *Weapon Systems and Political Stability*:

It has often been said that the Romans had no plans of world conquest and that they became rulers of the world in fits of absent-mindedness, like England acquired its empire. This may be correct, but it means nothing. The Romans had no long-range plans for world conquest because they had no long-range ideas on anything. But a state and a ruling group that obsessively judges every situation and every act in terms of aggrandizement of power will end up ruling the world or will be destroyed in the process. The Romans achieved both of these.

That last statement must be modified at once, because it is not true that the Romans were obsessively concerned with *power*. They were not, for they were obsessively concerned with something else, with honors, or with what they themselves called *dignitas*. The impression that they were obsessed with power arises from the fact that the chief methods of acquiring *dignitas* required the use of power. But we must see the relationship clearly, which is not easy because we must see it through Roman eyes, which were quite different from our own. Indeed, we cannot even accept this last sentence as stated because *dignitas*, the real motivating element in the Roman system, was not a concern of the average Roman and may have been almost as incomprehensible to such an average Roman as it is, say, to the average modern classicist. The fact is that the average Roman, or even the overwhelming majority of Romans, had almost nothing to do with the decision-making pro-

cesses within the Roman system and were as remote from the thirst for *dignitas* as they were from any thirst for power. In fact, excluded from both *dignitas* and power, the average Roman concerned himself with quite other things, including a thirst for land, or for money, or for sensual pleasures or for numerous other things. But these motivations of ordinary Romans, found, perhaps, among the majority of persons then, now, and at most times in history, were not the motivations which made history, least of all among the Romans. The vital decisions which made history in the Roman system were based, more often than not, on the thirst for *dignitas* possessed by that small and exclusive group who controlled the Roman system and made up the Roman establishment.

Political power in the Roman republic was in the hands of an “establishment” drawn from a couple of dozen noble families. These families were playing an infinite game that they called *dignitas*. There was always a danger of outside power in the form of military force, money or popular uprisings upsetting that game. The political rules used to dole out power in the Roman republic appear to modern eyes quite strange. But the rules had a purpose:

One of the chief purposes of the rules of the establishment was to exclude these three real elements of power (force, wealth, and numbers) from the system. These rules were set up like those of a game. The game was played according to the rules of families (rather than individuals) and the goal of the game was to maximise the “honors” possessed by each family. These “honors” were very concrete objects and were on display in the atrium of every successful establishment family. Such an atrium was like the trophy room of a yacht club or the gymnasium of a great university, placed so that all visitors to the building must pass by the display and recognise the prestigious record of those who own it.

This was the point of winning office as consul or censor; it was the point of military victories and foreign conquests. Force was excluded from the system by ensuring that the armies of Rome remained at a safe distance from the city. Wealth was excluded from the system by effectively restricting high office to the nobility, and although wealth was always useful, it was not possible to directly buy *dignitas*. Numbers were excluded from the system by a voting method where the establishment votes counted for more than common folk and where election days could be declared “inauspicious” by the official soothsayers and delayed until the lower classes had dispersed. The celebration of *dignitas* was most obvious at establishment funerals:

Every great family of the senatorial nobility had a hereditary clientele of supporters and dependents. These had the obligation to report every morning to their patron, the head of their noble family. As they came in, they paid their respects to the honors displayed in the atrium. When their patron died, they formed part of the funeral procession, the culminating event of a noble Roman's life. In that display the death masks, robes of highest office, and insigniae of honors were worn by relatives or other persons led by the representative of his most remote ancestor (who had made the family noble by first holding a curial magistracy), each ancestor's representative walking in file, ending with the one who acted for the dead man himself, wearing his mask and robes, and walking just before the coffin. Here on display was what the Roman establishment was all about, the motivation of the Roman nobility, and the key to the strange anomalies of the Roman social and political system.

The establishment in every society play their own infinite game, though they keep score in different ways. One of the strange anomalies of our own age is the persistent greed of the fabulously rich. For these people, as the *Pet Shop Boys* put it, "too much is never enough." This is because the score in their infinite game is measured in wealth. Trophies include the obvious mansions and private jets, but also "charity": a new wing at a museum or a university building. (In nineteenth century Britain, similar philanthropists built public infrastructure too. This is not fashionable with the modern elite unless it is infrastructure in a third-world country.) For the very rich, money is an end in itself, because it buys the trophies in their infinite game of wealth. Given the choice of further enriching themselves or allowing the lower classes to have slightly more wealth, they make the obvious choice. They can never have too much wealth, just as the Roman establishment could never have too much *dignitas*.

The British establishment of the nineteenth century had a somewhat different way to keep score. I don't want to paint too romantic a picture — these were the men whose self-serving "free trade" policies starved to death a million people in Ireland — but they were motivated by something more than mere wealth. "Honour" could not be bought, and it was a gentleman's most prized possession, sometimes higher than life itself. Their infinite game was closer to *dignitas* than to wealth. How else can we explain the dedication of middle ranking men who spent decades as "political agents" on the North West frontier of India and then quietly retired to Eastbourne?

There is a danger within all infinite games that the players just assume that the game maintains itself, that they don't need to make any effort to keep it going. If too many players just assume that the game will continue, regardless of their actions within the game, then it can collapse — perhaps into nothing at all, or per-

haps into a finite game with winners and losers. This is how the Roman republic ended. The thirst for *dignitas* drove the expansion of Roman power abroad. These conquests transformed the countryside around Rome, and changed the balance of Roman society. Once a patchwork of small farms, worked by free yeoman farmers, the countryside became a gulag of slave-labour estates. The free farmers had to sell-up and move to the provinces they had recently conquered as foot-soldiers. The previous inhabitants of those provinces were shipped to Rome, where they worked the fields as slaves. The establishment paid for both the land and the slaves with their war profits.

The game was changing. Where once the Roman army had been an army of land-owners, fighting for their property, now it became an army of the poor, following a particular establishment general, hoping for a payoff when they were triumphant. Once land had been a prerequisite for military service; now it became the reward. The thirst for *dignitas* concentrated power more and more in the hands of individual establishment generals. From time to time, the establishment united and turned on individuals from their own ranks whose success might break the infinite game. The last, and most successful, of these generals was Julius Caesar. When the dust finally settled, Julius Caesar was dead, but so was the Roman republic. The first Emperor, Augustus, ruled in Rome. Someone had finally won.

Let's now turn to the last of our three patterns: **aspects of sovereignty**. We say that nations are "sovereign states" and have something called "sovereignty," but what exactly is that? Sovereignty is usually something that governments have — but there are organisations which are not governments, and yet seem to have something like sovereignty. On the other hand, there are places even nowadays where claims of sovereignty by any government look pretty thin.

Political theorist Max Weber suggested a useful definition of sovereignty: it's a monopoly on the legitimate use of physical force in a particular place. Your government has sovereignty because if you decide not to pay your taxes, they will send round the police and force you to pay. Their use of force is *legitimate*, in contrast to a loan-shark's use of force if you don't repay him. The government has a *monopoly* on force: they choose how much force other organisations can use and when they can use it — the police are allowed to use limited force, but the loan-shark isn't supposed to use any.

However, some states seem to have partial sovereignty, and don't quite meet Weber's definition. For example, what about Mexico, where drug cartels use anti-tank missiles to blow up police cars? Where uniformed gunmen from the cartels walk around with the name of their organisation stencilled on their bulletproof jackets? Where gunmen emerge from prison at night to kill their rivals, then return to safety before the sun rises? The Mexican government has no monopoly on force. On the other hand, the cartels are not "legitimate," but that just raises a further question: who decides?

On the other hand, some organisations not recognised as states do seem to have something like sovereignty. We could call these organisations quasi-states — good examples would be FARC in Columbia or Hezbollah in Lebanon. We need a definition of sovereignty which is a bit more discriminating, and fortunately Quigley provides it in eight **aspects of sovereignty**, arranged in the order in which they historically tend to appear. Quasi-states tend to have only the first few of these aspects, mature nation-states have most of them.

- **Defence.** A community must be defended against attack and exploitation by outsiders. Without this, the other aspects of sovereignty cannot be preserved; some other organisation will come and steal them. The subject of defence against external threats is too large to properly explore here, so we will have to return to this in the next chapter.
- **Settling disputes.** There will be disputes within a community, and whoever is recognised as the effective and final arbiter of these disputes has this aspect of sovereignty. Note that this has *nothing* to do with laws and the enforcement of laws. It concerns things like feuds, rebellions, strikes and insurrections. It is purely about force or the threat of force, but this time force used against insiders in a society. This is the aspect of sovereignty which the government of Mexico lacks, and which the drug cartels, legitimate or not, have taken for themselves. To a significant extent they also have this power immediately across the border in the USA.

The drug cartels didn't at first realise that they were quasi-states. For example, the Cartel Del Golfo, operating in the eastern part of Mexico, saw itself primarily as an import-export business, because it did not produce its own drugs. So in the 1990s, along with many other businesses, they decided to outsource activities which were not part of their "core competence." They decided that settling disputes was not a core competence, and they contracted this out to an external organisation composed of former soldiers and American-trained counter-insurgency experts — the Zetas.

It turns out that the sovereign power to settle disputes *is* a core competence of a quasi-state which runs an *illegal* import-export business, because without this power there is no business. The Cartel Del Golfo was forced to bring this activity back "in house" but by then they had inadvertently created in the Zetas a rival quasi-state and a business competitor.

As with all categorisations, sometimes real-world events don't exactly fit. For example, what if an insurrection is promoted by an outside power? There is a grey area between defence and settling disputes. The important thing here is not to nit-pick about dividing lines, but to notice that there *are* different

aspects to sovereignty, and that it's possible for a state or quasi-state to have some aspects without having the others.

- **Administrative power.** For a community to continue to exist, there are certain things that need to be organised. For example, food has to be grown and distributed, fuel needs to be available, and so on. All these minutiae of life go unremarked most of the time; they are too ordinary to notice. The administrative power only becomes really noticeable in an emergency. For example, if there were a plague, someone would have to organise the quarantine of those infected, set-up improvised mortuaries, distribute medicine and vaccines. Who has the power to do this effectively? This is administrative power. It isn't following the prescriptions of a law — usually there could be no law in advance, and it wouldn't really be useful anyway.

Who chooses the new assistant secretary of the Treasury? Who selects the the new chief of police? Whoever has the power to make such a choice, at their own discretion, has administrative power. We also see administrative power at a small scale, at the scale where it makes no sense to have laws, where society operates through “common sense.” For example, a traffic policeman who directs cars to stop and start at a junction has administrative power. Who stops and who goes is purely at his discretion. He decides and the drivers obey him. The operation of an army also depends on administrative power: the officers invent the orders they think appropriate for each situation, and their troops follow those orders.

After hurricane Katrina, it was administrative power that was missing in New Orleans. The national and local authorities dealing with the aftermath concentrated almost exclusively on enforcing laws, particularly laws protecting property. The state demonstrated an almost complete lack of administrative power, and even attacked local groups organising their own survival.

- **Taxation.** The resources of a community are mobilised for public purposes via taxation. Almost all the other aspects of sovereignty incur some cost, and they must be paid for somehow. A state with the previous three powers still might not be able to raise taxes effectively: it's only worth trying to tax those who have wealth, and the wealthy may have enough power that they can resist the state's claims. It's worth looking more closely at a government which appears to have financial difficulties: although it may seem to have many aspects of sovereignty, it may be weaker than it appears. Power to tax seems to be a worthwhile diagnostic for this weakness. For example the “absolute monarch” Louis XVI did not have the power to raise adequate revenue through taxes — that's why he had to call the Estates General in 1789. We know what happened after that. In recent years, the government

of Greece hardly has any power to collect taxes, so we might eventually expect a similar outcome.

Taxation can take different forms: where gangsters run a quasi-state, their tax gathering looks like collecting protection money. States sometimes contract-out this aspect of sovereignty to commercial organisations, which on the ground can be indistinguishable from gangsters. Taxation need not be in money — the government of the later Roman empire gathered taxes in kind (shoes, grain, clothing and so on), to defend against the inflation which they themselves created.

- **Legislation.** This is the power to decide on and adopt new laws. In the early centuries of Western civilisation this power did not exist. There were laws and rules, but these were based on tradition and custom, community by community. The law was found, not created, by recording these local customs. Writing down the rules was not at first considered to be making new law, because it wasn't. This changed over time, so that in some places, the law was what was written, even if that contradicted what was customary. But not all states have this power. For example, the law of France before the French Revolution was the first kind of law, mere transcription of custom. After the Revolution, the *Code Napoleon* was the second kind: laws contrary to custom, created out of nothing. Napoleon had legislative power where Louis XVI did not.

In modern America, there has been a curious transfer of this sovereign power from the official legislative body, Congress, to corporations and to their masters, the merchant princes of the modern world. New laws with dense texts like telephone directories are proposed, debated, amended and passed without the members of Congress reading them at all. It's not clear who wrote the post-9/11 PATRIOT act, but it wasn't Congress. The 2005 bankruptcy law, making it harder for individuals to get out of debt by going bankrupt, was mostly written by lawyers working for the banking corporations, according to bankruptcy expert Elizabeth Warren. When threatened with regulation in 2010, the same banking corporations hired thousands of lobbyists, at a cost of over a billion dollars, to write and re-write the proposed law. Members of Congress were essentially their skills. The bankers got what they wanted.

- **Executive.** This is the power to enforce the law, to impose "law and order." Notice the difference between this and the administrative power — administrative power is arbitrary and discretionary, while executive power is a limited power to enforce the rules. Most customary law requires little power to enforce it because most of the enforcement is informal. But when

new laws can be created out of nothing, some power is necessary make sure they are enforced even when many people don't want to obey them. For example, during the Prohibition era, a large and mostly fruitless effort went into enforcing the unpopular law against alcohol. An even larger and more fruitless "war on drugs" is still being waged nowadays against other drugs, most of which were once legal. (On the other hand, even popular laws will be ineffective if those with executive power refuse to enforce them.)

- **Money control.** Control of coinage has been the prerogative of royalty from ancient times, with counterfeiting close to treason. But in the modern world, many states do not have the power of money control. Nowadays money control is about much more than coinage — only a tiny fraction of money is in the form of coins. Most money is just numbers in a computer, and is literally invented out of nothing by banking corporations. The subject of money is another topic which is too large to explore properly here, so we will come back to it in another chapter.
- **Incorporating power.** This is the power to create and destroy corporations — legal entities which are treated in some ways as if they were people. Corporations are make-believe people who are granted limited rights, for example the right to own property, and the right to sue and be sued in court. Until relatively recently, corporations in the English-speaking world were closely controlled, with very specific purposes and often with limited durations. The reason for these limitations was to stop the wealthy hiding behind these pretend "people," pulling the strings but shielded from the consequences of their actions. The United States does not currently have this power, because the government has no control over the rights of corporations; nor does it have any control over their purposes or duration.

This situation arose in a rather bizarre way, with a Supreme Court judgement in 1886. After the American Civil War, the fourteenth amendment to the constitution was adopted in 1868 with an "equal protection" clause intended to prevent discrimination against freed black slaves. It said that all persons were entitled to equal protection under the law. Well, not *all* persons — an attempt in 1874 to win votes for women on this basis failed when the Supreme Court said it was intended to apply only to black males. This didn't stop corporate lawyers claiming over and over again that it meant that corporate "persons" should also be entitled to equal protection. In 1886, one of the Supreme Court justices made an off-the-cuff-remark before delivering judgement on a case. This remark, to the effect that corporations *were* persons, technically had no legal standing. Nevertheless, this apparent precedent was wheeled out again and again by corporate lawyers over the decades and used to claim more and more rights for corporations. In 2003, a

broadcasting corporation even won the right to tell lies without penalty, on the grounds that having to tell the truth would infringe its “constitutional right” to free speech.

(At a risk of digressing from the main line of my exposition, I feel the need to point out an unnoticed contradiction at the heart of this scam. A corporation is undoubtedly property, and is also claimed to be a “person.” There is a name for a person who is property: a slave. All slaves in the United States were freed by the thirteenth amendment. So surely, if corporations are persons, they must be freed too? And freed without compensation to their former masters. But like a person in a coma, they are not competent to run their own affairs — if we ask them to say what they want, they will be unable to speak directly. Nowadays they only “speak” via a representative appointed by their master. So some sort of guardian will have to be appointed, and certainly not the representative of their previous master. Following this line of argument, it’s hard to see how the corporations can avoid eventually being made “wards of court,” administered by the state.)

When we split up sovereignty into aspects like this, we can see that some states have many of these aspects, some have only a few. Some states have these aspects in some part of their territory, but not everywhere. Some quasi-states — not recognised as nations by the UN — actually have more sovereignty than the official government. When we break up sovereignty into aspects like this, the issue of legitimacy fades away. We no longer have to decide whether an organisation has a *legitimate* monopoly on force. All we need to decide is who, if anyone, controls each aspect of sovereignty.

These patterns allow us to look at history and current affairs from different angles. In every society there are “elites” or establishment groups who have dominant political power. By “political power,” I mean the power to get other people to do what they want. The levers of political power are force, money and persuasion. Of the three, persuasion is most reliable. When you persuade someone that what they *already* believe means that they should do now what you want, then they are likely to keep doing it when you go away. Take away force or money, and there’s a good chance that they will go back to their old ways, because they never really changed their mind. (In case you didn’t notice, most of the previous chapters were about persuasion. The next two chapters are about force and money.)

Every elite or establishment group plays some kind of infinite game. In order to succeed in that game, the players want political power, and to get that power they each try to control some aspects of sovereignty. Or, since only relative strength is important, they might try to make the aspects controlled by rivals *less* effective. (Establishment groups can sometimes span several states, and disputes

which are apparently between different states may in fact just be jockeying for position in the infinite game played by their common elite.)

The social organisations supporting these aspects of sovereignty are themselves to some degree either instruments or institutions. The members of the establishment have little interest in whether these organisations fulfil their proper purpose, satisfying some human need in the society. Instead, the most important consideration is how much each organisation satisfies their personal need as a player in the infinite game. To satisfy their needs, they may want some organisations to be instruments, and others to be institutions.

Within the establishment there will therefore be a tension between two groups of people, with different approaches to the infinite game. One group, the **long-termers**, understands that winning and losing are secondary to keeping the infinite game going, and accepts that it is worth paying to keep society and its instruments in working order. They understand that it is necessary to “leave some money on the table” to preserve the infinite game. The long-termers are really conservatives, but they often look like radicals, because they have to work against vested-interests to reform or circumvent institutions.

The other group, the **short-termers**, are intent only on winning. (And, of course, psychopaths are most likely to fall into this group.) They assume that the infinite game will continue with no special effort on their part. They might appear to be conservatives, protecting the institutions that benefit them, or they might appear to be radicals, carelessly upsetting the status-quo and going “all in” without thought for the consequences. Although most will be knocked out of the game completely, just by chance one of the gamblers might win big.

Infinite games do sometimes end. Perhaps a short-terminer wins so big that they believe they can knock out all the other players for good. Perhaps the game runs up against some resource limit. In a game of accumulation, when there is no more stuff to accumulate, most players will realise that they can never beat the current winner, unless they change the game completely. Long-termers might engage in a rearguard action and try to prolong the game. Short-termers will of course do their utmost to be winners. One way or another, when most of the players want the game to end, it will end.

This was the situation at the end of the Roman republic, and it might be the situation today in the West in general and in the United States in particular. Author William Gibson, in his novel *Spook Country* suggests that the United States is in the grip of a kind of “cold civil-war” within the establishment, a civil war between long-termers and short-termers. He could be right. Despite its apparent military strength, the United States is in a difficult financial position. The infinite game of wealth has sucked money out of the pockets of ordinary people for decades, but this cannot go on forever. When something cannot go on forever, at some point it will stop. What then?

Chapter 7

Threats

I prefer to talk about threats rather than “defence.” For me, the word “defence” conjures up images of jet fighters and aircraft-carriers, camouflage uniforms and razor-wire. But this kind of military hardware only addresses a few of the external threats facing a state or quasi-state. Although “defence” is important, it’s also important to notice the other threats and not waste all your money on techno-porn weapons that look impressive at an annual parade, but only protect against one kind of danger. A state can defend itself if it can draw a boundary and control what crosses that boundary, and this mostly means control over the movement of people, goods and money.

It’s fairly obvious why a state has to control the movement of people across its borders: for example, in May 1940 when German ‘Army Group A’ motored and walked across the border into France, this conclusively demonstrated that the French state had less sovereignty in practice than anticipated. But it’s not just armies: any movement of people across a frontier is a threat to sovereignty.

On the last day of December in the year 406, in the depths of a bitter winter, a huge number of Germanic refugees were able to walk across the frozen Rhine and into Roman Gaul. Not just soldiers, but a whole society on the move: men, women and children. The late Roman Empire was, for most of its citizens, an oppressive totalitarian state, ruled by the property-owning, slave-owning establishment entirely for its own benefit. But for these Germanic refugees, pushed from place to place by the Huns behind them in the east, asylum in the empire looked like the best option. The Romans usually prepared a terminally frosty reception for such asylum seekers, but on that occasion they had their hands full elsewhere. The result was temporary ruin for Gaul — one witness said that “All Gaul was filled with the smoke of a single funeral pyre” — and eventual ruin for the whole western Roman Empire when a generation later the children of these refugees conquered Rome’s grain-growing provinces in north Africa.

Patriots in the southern states of the USA have a similar vision in their minds when they contemplate the refugees fleeing from the chaos in Mexico. They arrive in a steady trickle rather than an overwhelming wave, but in the end this is just as big a threat to sovereignty. People who are concerned about immigration are not necessarily bigots. Limited immigration can be advantageous — refugees are often the self-selected most dynamic members of their society. But imagine if the

population of the place where you are living more than doubled, so the incomers were the majority. Would you be concerned about that? Do you think it would change the character of your country? Would you be confident about your future, or that of your children? Now that we have established that there's a level of immigration you consider threatening, all we are really left to argue about is where to draw the line. The bigots draw the line at an absurdly low number, hoping to blame their current troubles on outsiders. But we all draw the line somewhere, for very good reasons.

This is one of those threats where an army doesn't really help: lethal force is not appropriate. Effective border police would be a better idea, or better still, some kind of political or economic action on the other side of the border so that people did not *want* to cross the border in the first place. (In fact, this was the approach that the Romans took for a long time: one of the reasons for the continual inflation and oppressive taxes in the late Roman Empire was the chronic need for large sums of gold, used for "foreign aid" and to pay the army. The "foreign aid" convinced the leaders of nearby tribes to be friendly and stay the right side of the frontier. The army was in fact mostly border police, often recruited from the same barbarians that they were holding back.)

The threat of population movement also works the other way around: it is dangerous for a state if too many people leave. Keeping a disaffected population imprisoned in a country is a poor long-term strategy, but it can work for a while. For example, in 1961 the government of East Germany decided to build a wall around the western-controlled sectors of Berlin, so as to forestall further mass defections through the city. (About 1 in 5 of the East German population had left during the previous decade.) The Berlin Wall stopped more people leaving, and for the next few decades they were forced to make the best of things where they were.

In the modern world, people can attempt to cross a frontier not just on foot, by land or by ship but also in aircraft, which can come from anywhere in the world. So states now effectively have borders with more neighbours than they did a century ago. Today you can get anywhere inside a day, so refugees can come from everywhere. And yet inside today's states there continue to exist small regions, unacknowledged quasi-states, with strangely complex boundaries that can only be crossed on foot. This is most obviously true about faraway places like the mountainous tribal regions of Afghanistan, but you can probably think of places closer at hand. Places where the police go in force or not at all, places where different rules apply, places where the sovereignty of the surrounding state is more theoretical than real.

But controlling the movement of people is not enough. To properly defend a state it is also vital to control the movement of goods and money across its boundaries. I realise that this idea is contrary to the current capitalist euphoria for "globalisation." According to the globalists, free movement of goods and money

brings economic benefits to everyone, and it is perverse to impose restrictions. Nevertheless, governments do place restrictions on the movement of goods and money. Why do they do this? Don't they realise that they are causing harm?

The key here is to understand that this is an issue of national security, not just economics, and that the interests of the globalists are not the same as the interests of states or their peoples. Although the globalists themselves enjoy almost unlimited freedom to travel, they are happy to see the masses pinned in place behind national borders. But when states restrict the movement of goods and money across those borders, this reduces the profit of the globalists, maybe even puts them out of business. Obviously the globalists will rail against restrictions on "free trade," as though this was a human rights issue. However, free movement of goods and money bring substantial threats to state security.

Let's look first at the movement of goods. Economist Adam Smith famously demonstrated in *The Wealth of Nations* that division of labour could make goods cheaper. People who try to do everything for themselves are less productive than people who specialise. A skilled craftsman can make something more quickly and cheaply than you, so when you want that thing you should buy it from them rather than trying to make it for yourself. There will be things that you are better at, so you can make money by specialising in those things. That way both you and they will have more things and more money than if you decided to do everything for yourselves.

Not only that, but a group of people can specialise in the different aspects of making one particular thing. Smith's example of a group of people making pins together is today celebrated on the back of the British 20 pound note. Each person specialises in one aspect of the manufacture, production of pins goes up and cost goes down. With increased volume of production, it becomes worthwhile to invest in special tools to make pins even faster and more cheaply.

The same argument can be applied almost everywhere: specialise in the things that you can make more cheaply than other people. Buy the other things you need with the money you make. Why dig coal when you can buy it more cheaply? Why grow corn when you can buy it more cheaply? Specialise in what you make best and buy the rest from the cheapest seller. Both you and they will be better off. This is the killer argument for free trade. Everyone wins.

Until it goes wrong. What seems like a plausible argument about a local pin-factory stops working when we scale it up to the size of a whole country. Take the example of Britain in the nineteenth century. Britain specialised in industrial production, importing raw materials, processing them and selling the finished products abroad, often to the very countries that had supplied the raw materials in the first place. Britons were keen globalists, apostles of free trade, if only because the whole "business model" of the British state required other countries to accept British goods without the import taxes that might give local production a chance

to compete. The British Empire acted in large part as a sink to absorb the excess industrial production of the British Isles.

But free trade had unanticipated consequences. At the time of the Napoleonic wars, Britain grew almost all her own food, but as the nineteenth century grew older the fraction of imports gradually increased. After the American Civil War, railroads were built out into the prairies in the United States and new farms produced wheat far more cheaply than any farm in Britain. After the financial panic of 1873, some countries, for example Germany, imposed import taxes to protect local agriculture and industry. But Britain stuck to her free trade principles (and was gradually overtaken in industrial production by Germany). On the eve of the First World War, British agriculture had declined to such an extent that Britain imported about half of her food from abroad. From an economic point of view this was cheaper and better, but strategically it was extremely dangerous.

Amongst the various causes of the First World War were the conflicting strategic needs of Germany and Britain. Germany needed access to overseas markets so her industrial growth could continue, but the Germans did not want to ask permission from the Royal Navy to cross the oceans of the world. The Germans wanted their own navy, just as good as the Royal Navy, so they could deal with the British as equals. The British on the other hand could not allow the Germans to have such a powerful navy, because it would be an existential threat to Britain. The British had accidentally put themselves in a position where they could be starved out. This possibility never occurred to the British at the start of the First World War — in fact the British used their naval strength to blockade Germany and prevent any neutral ships sailing to her ports. The Germans were so inconvenienced by this siege that they eventually decided to allow their submarines to sink without warning any ships heading to Britain. As a result, Britain came within a few weeks of famine, and more resolute submarine warfare by Germany might have changed the outcome of the war.

The moral of this story? When a large fraction of something vital is imported by a state, it's never just a matter of economics, it's always a matter of national security too. An attack doesn't need to come with guns and planes. It can come in the form of subsidised cheap grain, putting your farmers out of business, driving them to shanty towns and destroying your ability to grow your own food. It can come in the form of cheap gas, pumped half-way around the world through a pipeline, and switched off by an enemy in the depths of winter.

Movement of money across borders is a slightly more subtle security threat than movement of goods, but it's a threat that has devastated many countries. It's a threat that the United States government thinks it understands. It's a threat that the Chinese government understands perfectly.

The threat comes in two flavours, which I'll call "slow-ruin" and "quick-ruin." Slow-ruin works a lot like the loans made to people in the "sub-prime" housing

crisis. Banks make loans to people who can't really afford to repay them. The people handling the money each take their cut, so they are enthusiastic about the deal. The money is spent, usually with little to show for it a few years later. The debt payments go on. And on.

States borrow in the same way. Does a state have the power to stop the flow of money? If things go wrong, can a state default on its debt? Can it effectively declare bankruptcy and start again? If it can't then it loses almost all other aspects of its sovereignty. Outsiders, these days usually from the IMF, will come and take over the administration of the state, so that even if it still has a seat in the United Nations, it has less real sovereignty than unrecognised quasi-states such as the FARC or Hezbollah.

The other money threat, quick-ruin, looks like an investment rather than a loan, but the results are equally unpleasant. The way it works is that outsiders bring a lot of money into a state and invest it in a bank. The bank pays the investors interest in the usual way, and loans out the money in turn to local businesses. These businesses spend their money in productive ways, building factories and hotels, clearing land, planting crops and so on — things that will be profitable and pay back the loans in five or ten years. However, the outsiders don't give them that long.

In two or three years, they pull their money out of the bank, and the bank now has a problem. It doesn't have the money on hand — it's all loaned out. The bank has a "liquidity crisis" — if it can't raise money quickly it will be bankrupt. So it calls in loans where it can, refuses to make new loans. Local businesses can't replace these loans, so they in turn have to sell what they can, maybe sell their whole business, even though it is profitable, because *they* now have a liquidity crisis too. In this "fire sale" everything is going cheap, which is what the outsiders wanted all along. The outsiders are waiting with their money, and when the crisis is at its peak they come back to buy up the factories, hotels and plantations at knock-down prices.

Something like this scenario unfolded all over east Asia in the late 1990s, and explains a lingering bitterness towards western bankers amongst those who understand what happened. The Chinese seem to have a keen appreciation of the importance of controlling the flow of goods and money across their borders, which is unsurprising given the way their country was taken apart during the nineteenth century by European states using exactly these threats. The United States has been very happy to employ these threats against other countries, but has not yet noticed its own vulnerability. It currently enjoys imports of goods produced by other states, paid for with money borrowed from other states, with no prospect of ever paying it back. Only in the area of military hardware is the United States still pre-eminent — the USA spends more on warfare than the whole rest of the world put together. But its lack of control over the flow of goods and money make it

extraordinarily vulnerable.

Having established that there is more to defence than warfare, there's still a lot that we can usefully say about warfare itself. If you want to understand current events or history, you need to understand warfare. If you are a hacker trying to resist a tyrant by force, you need to understand warfare. But the first thing to understand about warfare is that:

All war is shit; no one walks away with clean hands.

War is not nice or clever or elegant. It's inevitably worse than awful, and no one should go there with a light heart. Sometimes, faced with oppression, exploitation and death, it's the least bad alternative, maybe even the honourable choice. But it's still shit.

With that disclaimer, let's look at some practical issues. I imagine that if you have a personal interest in warfare, if you are a hacker facing a tyrant, then you will be the underdog, but that's not as bad a position as you might think. The underdog in warfare has a considerable advantage. Old established military organisations are, in Quigley's terms, social institutions: more concerned with maintaining themselves and advancing their own interests than in defending their society against real threats. Although all social organisations tend to become institutions eventually, an underdog organisation is at the start a social instrument: its members put a considerable effort into achieving its fundamental purpose.

In an article entitled *How David Beat Goliath*, writer Malcolm Gladwell explains what this difference looks like in practice: it's a combination of extreme effort plus a willingness to break the perceived rules and play by the actual rules. For example, in the First World War, archaeologist and military historian Thomas Lawrence was instructed by the British army to organise a force of Bedouin irregulars and make trouble for the Turkish garrison at Medina. Rather than assault the city, Lawrence decided to play by different rules: his troops sped around the desert, again and again dynamiting the one railway line to Medina and causing disruption out of proportion to their small numbers. This tactic took extreme effort and a willingness to engage in a disreputable form of warfare. From the point of view of the British, Lawrence was a guerrilla or commando; from the point of view of the Bedouin, a freedom fighter; from the point of view of the Turks, a terrorist.

Lawrence's most spectacular victory came in 1917 when he emerged unexpectedly out of the desert with a few hundred Bedouin and captured the Turkish port of Aqaba with its 1200-man garrison. The Bedouin lost only two men in the assault. The Turks were surprised because they had expected an attack from the sea, and they thought their rear was secure, protected by impenetrable desert. Lawrence and his troops had just made a 600 mile trip through that desert, at the height of summer. As Gladwell says:

The Turks simply did not think that their opponent would be mad enough to come at them from the desert. This was Lawrence's great insight. David can beat Goliath by substituting effort for ability — and substituting effort for ability turns out to be a winning formula for underdogs in all walks of life.

In the words of Sun Tzu, “all war is deception,” and like the deception of a stage-magician, the main part of the deception is that the audience doesn't appreciate the extreme effort that was needed to prepare and execute an apparently simple but mystifying trick. It looks like a miracle.

In war, part of the effort is physical, but part is moral: a willingness to find the true rules and to exploit them, even though that breaks the perceived rules. Successful underdogs don't play the respectable way. They look awkward and foolish. In the American War of Independence, the underdogs at first hid and shot from cover, they didn't stand out in lines on the open field of battle like a respectable army. They broke the perceived rules. But the moral pressure to play by those rules is immense. As soon as he could, George Washington formed his guerrillas into a disciplined army that stood in line and fought the British in the proper way. They lost. When you fight the proper way and lose, criticism is minimal. On the other hand, when you break the perceived rules, even if you win you will be treated as an underhanded cheater, dangerous and untrustworthy. It takes a moral effort to turn your back on respectability and play to win. If you can do it, if you can keep doing it, you have a tremendous advantage.

The Turks considered Lawrence a cheater and a terrorist. The British were not terribly happy with Lawrence's tactics, but they were happy to accept his victories as a guerrilla leader. In truth, there is a spectrum from conventional warfare via irregular forces, guerrillas, commandos and “special forces” to out-and-out terrorists. There is no definite point where one stops and the other starts. Rather than try to classify them on a scale of respectability, it's instead more fruitful to classify the different kinds of attacks that these people carry out.

The best classification of attacks I've found is in a book published anonymously on the web called *Tremble the Devil: The story of terrorism as Jesus Christ, James Bond and Osama Bin Laden would tell it*. The unknown author, who for want of a better name, I will call “Tremble,” claims to be a Harvard graduate and to have worked as a counter-terrorism expert for the US Department of Defence. We can't tell whether that is true, but the book reads very well and seems plausible.

Amongst the many insights in this book is a classification of different kinds of terrorist attack, but this classification actually applies more widely to all kinds of warfare. Tremble draws a distinction between **symbolic attacks** and **material attacks**. The purpose of a symbolic attack is to send a message, mostly to supporters on the side of the attackers or to undecided people on the side-lines. The message is that the other side is vulnerable, that the fight goes on, that victory is possible.

The symbolic attack drums-up support for the cause, so it is always necessary to claim responsibility for it. Though it may seem despicable to its victims, the symbolic attack must seem morally justified to supporters on the side of the attackers, otherwise it's counterproductive.

By contrast, the purpose of a material attack is to cause substantial damage to the enemy, to reduce the enemy's ability to wage war and to convince the enemy that the fight is not worth it. This is usually the ostensible purpose of conventional military action, but it is sometimes the purpose of terrorist attacks too. Since a material attack doesn't send a message to supporters, it's not important to announce who it came from, and there's no need for the attackers to claim responsibility.

Tremble uses the 1983 bombing of the US Marine barracks in Beirut as an example of a material attack. Hezbollah had been commissioned by Iran to carry out this attack and they quickly built a replica of one of the bright yellow Mercedes trucks that passed by the barracks every day. Loaded with explosive equivalent to around 6 tons of TNT, and with a kamikaze-driver at the wheel, the truck turned off its usual early morning route and raced up to the barracks. The explosion killed 241 marines, mostly while they lay asleep. There was no need to claim responsibility. The origin of the attack was still unclear when, a few weeks later, President Reagan announced the withdrawal of US forces from Lebanon. The material losses were unacceptable.

Hezbollah was willing and able to execute this material attack because it was not at the time a tiny underdog organisation — it was a substantial quasi-state. In contrast, a small organisation has to concentrate on symbolic attacks, because it needs to gather support. The biggest danger for a small organisation is that it appears powerless, irrelevant and boring. Secret victories are a luxury which a small organisation can rarely afford.

Building on this basic classification, Tremble introduces the more sophisticated idea of a **political attack**. This takes place in three phases: first there is a symbolic attack, which acts as a provocation. Second, there is a reprisal, and the point of the symbolic attack is to provoke as dramatic and unfair a reprisal as possible. This is so appalling that the original symbolic attack seems insignificant in comparison. The third phase is retribution: the original symbolic attackers gain many more supporters as a result of the reprisal, and with this increased support they are able to achieve their political aims.

A good example of a political attack is the 1916 Easter Rising, in which a small group of Irish separatists seized some buildings in central Dublin and declared a republic. A highly symbolic act. However, it was not a coup in the usual sense. They did not capture Dublin Castle, the seat of government, nor did they capture the communications infrastructure vital to a successful rebellion. Instead they hunkered down in places like the Post Office and waited for the British army to come and get them. It was a short wait.

The inhabitants of the surrounding slums were not enthusiastic about the rebellion. There was at the time close to a famine in Dublin, and several poor Dubliners were killed by the rebels as they went out searching for food. In contrast, the British army commandeered supplies from warehouses and distributed food to the poor. The rebellion failed, crushed within a week. If the British had shown restraint, that would have been the end of it.

Instead, the British insisted on revenge. As well as the 450 people killed in the week of the rebellion, the British afterwards executed all of its leaders. And so the separatists had their retribution: in the elections of December 1918, the Republican party won 73 of Ireland's 103 seats and the war for Irish independence began in earnest.

You can also see these ideas unfold in conventional warfare, not just in terrorism and rebellion. For example, after France fell to the Germans in 1940, the Luftwaffe waged a campaign of aerial warfare against Britain, known as the "Battle of Britain." This was a material attack, directed at the airfields and air defences of Britain. If the Germans had been able to establish "air superiority" over Britain, the British government would almost certainly have had to seek an armistice, like the French, even if the Germans did not invade across the English Channel.

Although the Germans came within few days of achieving their aim, they in fact decided to break off the attack on military airfields and switched instead to bombing civilians, mostly in London. Why? The British had launched a symbolic attack, which eventually unfolded into a political attack. In the last days of the Battle of Britain, a force of British bombers dropped bombs on civilians in Berlin — a symbolic attack of no material consequence. But the attack touched a nerve. It couldn't go unanswered. Hitler instructed the Luftwaffe to break off attacks on RAF airfields and instead to concentrate on civilian targets. "The Blitz," as it became known, had started. That September, there were thousands of civilian casualties and the East End of London was smashed into a ruin.

The reprisal was out of proportion to the symbolic provocation, and British resolve was strengthened by the German attacks. Not only that, but it became more acceptable in the neutral United States to give material support to plucky Britain, seen to be resisting German aggression against the odds. The Americans lent the British the weapons and food they needed to continue the war.

Of course, as Tremble points out in his book, the most effective form of political attack is one where the initial symbolic attack is just an insult, a demonstration or a protest. He says that, looked at this way, the protests of Martin Luther King and of Mohandas Gandhi were extraordinarily successful political attacks on the governments of their countries. They provoked disproportionate reprisals, leading to a surge of political support for the protesters.

There is one further kind of attack which Tremble does not mention, but which we need to look at for the sake of completeness. This is the **false-flag attack**.

When the enemy cannot be provoked into a reprisal by insults or symbolic attacks, a reprisal can be faked-up. The reprisal attack is not what it seems: really it is make-believe, hence the term “false-flag.” This apparent enemy attack is then used to recruit popular support for the subsequent “retribution.”

It’s in the nature of false-flag attacks that they are not what they first appear. However, we have a few clear examples from history, and there are presumably more that we don’t know about yet. For instance, in 1931, the Japanese arranged what is now called the “Mukden Incident” as an excuse to invade Manchuria. The Japanese claimed that the Chinese had planted a bomb that exploded under the railway line near Mukden in Manchuria, the north-eastern province of China. At that time, China had little effective sovereignty, and Japan had owned the railway line through Manchuria since its war with Russia in 1905. Japanese troops were garrisoned in the railway zone, and following the railway bombing, the Japanese retaliated by attacking Chinese military installations at Mukden. Shortly after that they invaded and seized all the rest of Manchuria.

In fact the bomb was planted by the Japanese. As is typical with false-flag attacks, the Japanese retribution was rather too well prepared. The Japanese, for example, were able to conveniently shell the Chinese barracks and airfield at Mukden with two substantial pieces of artillery, installed secretly in a nearby gun emplacement. This installation, built under the pretence of digging a well, was completed only days before the bomb exploded.

In a similar vein, the Nazi government of Germany staged several false-flag attacks on the eve of the invasion of Poland in 1939. At Gleiwitz, German troops dressed as Polish insurgents seized the town’s radio transmitter and made a short broadcast in Polish. To make it look more convincing they left a dead body behind, apparently one of the “Poles,” made to look as if he was shot dead during the attack.

Of course, we only know about false-flag attacks whose perpetrators eventually ended up on the losing side of a war. The successful ones may never come to light clearly. The most convincing kind of false-flag attack would be one which used informers or double-agents who genuinely did work for the other side. If they died during the false-flag attack, who afterwards would be able to say that it was a fake?

So — things start with these different kinds of attacks, but how do things end? Only very rarely do they end with the complete annihilation of the losers. There are examples of this, but they are unusual. In 146 B.C., the Roman Republic triumphed over Carthage for the third and final time. Roman soldiers burned the city and systematically demolished its walls, stone by stone. The devastation was exactly as if an atomic bomb had exploded very slowly, taking months to do its damage rather than seconds. Except that the inhabitants, rather than being transformed into radioactive toast, were carried off to Rome as slaves. In Rome they filled the ecological niches which are occupied in our modern world by household

appliances and agricultural machinery.

But this is rare. Perhaps the best perspective to think about the end of wars is that of finite and infinite games. Most wars are finite games, which means that both sides must share a common definition of what it means to lose the game. At that point one side gives up, the victor picks up some prize, and life goes on. Think about France and Germany in 1940. The Germans followed the advice that Sun Tzu would have offered them: take a state intact, don't destroy it. The Germans offered an armistice to the French which left most aspects of ordinary life unchanged. The French accepted the deal because they shared the same definition of losing.

What happens when the sides don't share the same definition of losing? When the Germans fought the Russians in World War II, the Russian soldiers at first surrendered to the Germans. However, the Germans were unwilling to accept this surrender in the usual way: they killed millions of their prisoners. The victors didn't accept that the losers were out of the game. Russian soldiers learned that the German definition of "losing" was nothing short of death, so there was little point in surrendering. Eventually the two sides did agree: the Russians applied the same definition of losing back to the Germans, which was in some sense fair but perhaps not what the Germans had intended.

This can work the other way around too. In the First and Second Punic wars, the Roman Republic suffered several utterly devastating defeats, but they never accepted that they had actually lost. Any other state in the Mediterranean world would have negotiated a peace, but the Romans refused to give up. In the words of Ennius, "The victor is not victorious if the vanquished does not consider himself so." The Romans doggedly fought on, and eventually they got the upper hand. There came a point in each war where the Carthaginians were willing to concede that *they* had lost. (The Carthaginians never admitted defeat in the Third Punic war — it was a fight to the death.)

The British position at the end of 1940 looked pretty bleak too. The Germans couldn't invade Britain, but Britain had no allies left and little hope. (Remember that Russia and Germany were still friends at that time, and although the USA was lending food and weapons to Britain, it was not itself at war.) The sensible thing to do would have been to sign an armistice with the Germans. Winston Churchill refused to contemplate the idea, and instead used one of the two classic British stratagems: "play for time." In the British national game of cricket, it's possible to turn a losing position into a draw if you "play for time." Wellington did this at Waterloo against Napoleon, and Churchill did it in 1941 against Hitler. (The other traditional British stratagem is "death or glory" — in a pinch, go "all in" and risk everything to defeat the enemy. Nelson did this at Trafalgar; Fighter Command did this at the height of the Battle of Britain. The British, probably unintentionally, risked and lost their whole empire in order to defeat Hitler.)

Sometimes in war something rather odd happens, and the two sides turn what started as a finite game with winners and losers into an infinite game. We can find good examples of a this in the trenches of World War I — to the despair of their commanders, the soldiers tended to strike informal truces with the enemy. The famous example of soldiers playing football in no-man’s land on Christmas Day is just one of many cosy local arrangements. The soldiers knew that any attack would provoke a tit-for-tat reprisal, but kindness would also be reciprocated. Both sides refrained from shelling meal deliveries to the front, so that they could each eat their own food in peace. Towards the end of the war there were wide-spread mutinies, and the soldiers on both sides were starting to form the idea that they had more in common with the “enemy” on the other side of the barbed wire than they did with their own high command.

Government propaganda, attempting to dehumanise the enemy, had failed due to long and close proximity of the two sides. By the end of the war, France had lost 1 in 5 men of military age. But it would have been even worse if everyone had tried their hardest to kill each other all the time, rather than sometimes saying “let’s live and let live.” (In the seventeenth century, amongst the countries involved in the Thirty Years War, 1 in 3 of the *entire population* died.)

So, as an underdog you can defeat a stronger enemy by substituting effort for ability. Use disreputable tactics, and do what is effective rather than what is respectable. When you are weak, use symbolic attacks to attract support. Turn these into political attacks when you can, by provoking unfair and disproportionate retaliation. You can win in the end, even if you have lost right now, provided you don’t admit defeat and you keep the game going.

As an incumbent, faced by an underdog, it’s most important to trivialise and forgive symbolic attacks. Don’t be provoked into disproportionate retaliation unless you can utterly crush the underdog. The underdog’s organisation is a social instrument, far more effective than your own institutions. Try to even things up by accelerating the underdog’s transformation into an institution. Be kind to the underdog’s political supporters, give them part of what they need: maybe they won’t support the underdog any more. Infiltrate the underdog organisation and recruit double agents. Try to sow distrust, and split the organisation into factions if you can. (Of course, the underdog can also work these tricks the other way around.)

What more can we say about warfare? Countless books have been written on the subject, from Sun Tzu’s *Art of War* onwards. (Still worth a read.) You can find out what you need. Perhaps the only remaining topic that’s not widely understood is the nature of weapons and their effects on society.

Carroll Quigley, in his book *Weapon Systems and Political Stability*, drew a useful distinction between two basic kinds of weapons: “shock” weapons and “lethal”

weapons. Examples of shock weapons are spears, clubs, swords, bayonets and so on. They can be used to kill, but they can also be used to coerce and control. Shock weapons can be applied gradually, along a scale from prodding to killing. They are the weapons of choice for police forces, controlling crowds with batons and riot-shields or even rifles with bayonets fixed but no bullets.

In contrast, lethal weapons such as arrows, bullets and bombs are not gradual. You can threaten to use these weapons, but if your threat doesn't win cooperation, your only remaining option is to shoot, with deadly results. (And if you miss, the result may be deadly for you. For example, a cross-bow takes quite a long time to reload. If you miss, you are now unarmed and facing someone who knows you're prepared to kill them. Oops.)

Before the invention of gunpowder, societies often had to specialise in either shock weapons or lethal weapons. Early medieval Europe chose shock weapons: the mounted knight with lance and sword. The Mongols under Genghis Khan were also mounted on horses, but chose a lethal weapon: bow and arrow. In part this choice was affected by the concerns of those particular societies. Was it most important to be able to extort money from local people and settle disputes? Choose a shock weapon. Or was it more important to fight external enemies? Choose a lethal weapon. When circumstances change, we may see a switch from one to the other. This is what happened in seventeenth century Japan.

In the sixteenth century, Europeans introduced firearms to Japan. The Tokugawa Shoguns prevailed in the subsequent musket-equipped civil wars, unifying the whole of Japan for the first time. (Previously, the country had been a collection of separate quasi-states, loyal in theory to an Emperor who had no practical sovereignty.) Lethal weapons had been necessary to conquer the Tokugawa's enemies, but in the seventeenth century that fight was won. The Shoguns now controlled a unified country, difficult to attack from the outside, and they instituted a police state. Europeans were expelled, except for a tightly supervised colony of Dutch traders, and guns were phased out by government decree. With guns forbidden, the samurai with their famous swords were once again dominant. Lethal weapons had been replaced with shock weapons, the weapons of choice for coercion and control.

Shock weapons are always short range, so a numerical advantage in battle can be hard to exploit. In a disciplined formation, regardless of the size of the enemy force, there will be only a few places where one man has to face several others. The key is to maintain a smooth perimeter, and avoid panic and crushing. Due to scaling-laws, in a larger formation, it will be easier to avoid a break through in the perimeter, but harder to control dangerous crushes. Larger numbers will tell eventually if soldiers from both sides fall at a steady rate, but this could take a long time. Crushes can be more decisive in the short term — a column of French revolutionary soldiers could punch through a line of professional infantry by sheer

momentum. On the other hand, a large stationary body of soldiers can be made completely ineffective if it can be turned into a crush — as presumably happened at the battle of Cannæ, when Hannibal’s smaller Carthaginian force of professional soldiers surrounded and over several hours hacked to death a much larger force of Roman amateurs.

Missile weapons, on the other hand, act at a distance, into an area rather than across a perimeter, but there is a really surprising difference between aimed and unaimed fire. This effect was understood intuitively by soldiers and sailors, and was finally explained properly by engineer Frederick Lanchester in 1916. With unaimed fire, shots are made randomly into an area known to contain the enemy. Perhaps this is because they are hidden in cover, or perhaps they are at long range and it is impossible to aim more accurately. Either way, with unaimed fire, the fighting strength of a body of attackers is proportional to their number, just as you might expect.

However, when fire is aimed at enemy units which are themselves returning aimed fire, then the fighting strength of a body of attackers is proportional to the *square* of their number. The classic example of this is a naval battle where all ships are in range of the enemy, and both sides are able to choose their targets. Because of Lanchester’s *N-Squared Law* it is extremely advantageous to group your forces together, and to divide your enemy. (Though it’s even more advantageous to fire from cover, forcing your enemy to use unaimed fire while you use aimed fire — for example by using a submarine.)

The *N-Squared Law* explains Nelson’s choice of tactics at the battle of Trafalgar. Nelson’s plan was to divide the enemy into two roughly equal sized groups, but divide his own force unequally. Lanchester’s N-Squared Law means that a 3 to 2 advantage in numbers translates into a roughly 2 to 1 advantage in fighting strength. Nelson intended that his smaller force would fight a “play for time” battle-within-a-battle, while his larger force obliterated one half of the French and Spanish fleets. Having won that part of the battle, Nelson’s ships could then turn and join their battered comrades, but still have the advantage over the remaining French and Spanish fleets. (It’s interesting that Nelson came up with this plan out of experience, over a century before Lanchester explained why it worked.)

Let’s now finally turn to the effects of weapons on the people who *use* them. Different kinds of weapons change their users in different ways, and they also change their society as a whole. Most people don’t like to kill. During the twentieth century, with conscripted mass armies using lethal weapons, it eventually became clear that only a small fraction of soldiers aimed and fired their weapons at the enemy. Most simply didn’t fire. Those who did fire often aimed to miss.

According to military historian John Keegan, the difference between a murderer and a soldier is that a murderer is prepared to kill, but a soldier is prepared to die. The soldiers who aimed-off had decided that they could not face being murder-

ers, and in the heat of battle had instead decided to become conscientious objectors — at some risk to themselves, since they could not be sure that the enemy would be equally kindly in return. This mass failure to shoot drove their senior officers to distraction when they realised what was happening. What could they do about it?

The generals called in the psychologists, and the psychologists already knew how to solve the problem. Their method was “behavioural conditioning,” the same technique that animal trainers use to get circus animals to perform tricks. So, after the Second World War, basic training for infantry changed, and it became closer to a simulation of battlefield conditions. Rather than set-piece shooting at paper targets, nowadays soldiers train by moving through a landscape containing “pop-up” targets shaped like an attacking enemy. The soldiers are trained to quickly aim for the target’s centre-of-mass and pull the trigger. “Well done!” say the trainers. The soldiers’ adaptive unconscious, always on the lookout for patterns, makes the association between quickly shooting at the centre-of-mass and praise from the trainer. It’s a good thing. On the battlefield, presented with a similar situation, the adaptive unconscious has aimed and fired before the soldier’s conscious mind has noticed.

The behavioural psychologists knew their craft. In the eyes of the soldiers, the enemy changed from a person into a thing. More soldiers shot at their enemy in the Korean War, more still in the Vietnam War. But there was a price, and there has been a price ever since. The soldiers have to live with their killings afterwards. They feel that they have become something dirty. Amongst infantry there has been an epidemic of illegal drug use and suicides. During the Iraq “Surge” of 2007, more than 20,000 US soldiers in Iraq were being prescribed antidepressants and sleeping pills in an attempt to suppress their symptoms. (If you see a video of US troops from this time and they seem weirdly spaced-out, that’s probably because they *are* weirdly spaced-out.)

You might think you have an ingenious solution to this problem — why not use the one group of people who really aren’t bothered by killing? Psychopaths. It’s already been thought of, and the problem is that it doesn’t work very well. Psychopaths are unreliable, only interested in what’s in it for them. In a tight spot, given a choice between fighting together and running away, they will usually run away and leave you to die. No fear and no conscience, but also no honour and no shame. And anyway, it would be deeply dangerous to place the defence of a society in the hands of its least trustworthy members. It could be the last mistake that society made.

Use of weapons changes individuals, but does it also change the nature of a whole society? Carroll Quigley suggests that specialised “professional” weapon systems like the medieval mounted knight and the modern Predator drone tend to promote authoritarian government. They are expensive to maintain and they are

difficult to use, so only professionals can use them effectively. A small authoritarian group can therefore control these weapons and decide when to use them, without much concern about its own security, and without worrying about the opinions of the majority of their society.

On the other hand, “amateur” weapon systems can be used with little training, and are so cheap that they are affordable by the average person. When the most effective weapons in a particular age are amateur weapons, Quigley suggests that this tends to promote democracy, because it is impossible for a small authoritarian group to enforce the obedience of the majority. This happened during the nineteenth century, starting with the mass armies of revolutionary France, and ending with the mass armies of the First World War. This era was clearly a time of cheap, easy to use, mass produced weapons and also of rapidly growing democracy. The turning point came during the First World War, and in the twentieth century the pendulum swung back the other way, with increasing specialisation, expensive weapons and professionalism. What happened to democracy?

During the Cold War, politicians in the West could point to the Soviet Union as a clear instance of an authoritarian government with a professional military. Looking in the opposite direction, whether or not the USA was democratic at home, it was at that time clearly in the business of suppressing democracy amongst its client states and installing authoritarian military dictators. So there seems to be some truth in Quigley’s suggestion. But now the Soviet Union is long gone, and the reason for most of the West’s weapons gone with it, so what will the future hold? Quigley made an eerie prediction, back in 1961, at the height of the Cold War:

We are told that we now live in a “two-power world,” although the power of the United States and of the Soviet Union is not in fact hemispherical. Each of these superpowers can, it is true, obtain obedience in most matters over about forty percent of the earth’s surface, but this leaves a buffer area between, amounting to about a fifth of the earth. This “buffer fringe” lying between the Soviet “heartland” and the peripheral, and ocean-linked, Western civilization is occupied by the shattered remnants of dying civilizations or the hopeful efforts of incipient new civilizations. The hope of the future does not rest, as commonly believed, in winning the peoples of the “buffer fringe” to one superpower or the other, but rather in the invention of new weapons and new tactics that will be so cheap to obtain and so easy to use that they will increase the effectiveness of guerrilla warfare so greatly that the employment of our present weapons of mass destruction will become futile and, on this basis, there can be a revival of democracy and of political decentralization in all three parts of our present world. This would, of course, require the development of

decentralized economic techniques such as could arise if sunlight became the chief energy source for production and the advance of science made it possible to manufacture any desired substance by molecular re-arrangement of such common materials as sea water, plant fibers, and ordinary earth.

Some of this has now come to pass. We are still waiting for solar-powered nano-tech fabricators, but new weapons and tactics have arrived. The new tactics use the mobile phone, supported by a vast computing and telecoms infrastructure. Despite the hype, on-line “social networks” are no substitute for old-fashioned organisation, determination and trust, but the new technology brings within the reach of small underdog groups the information and communication capabilities once reserved for nation-states.

The latest “amateur” weapon is the human-detonated bomb, in the form of road-side mines or suicide-bombs. These are “precision guided” lethal weapons where the precision is provided by a human hand rather than by complex technology. As the wars in Afghanistan and Iraq have shown, although the USA has enough lethal weapons of mass destruction to kill everyone in those countries many times over, these weapons are in practice useless.

Despite the chaos and suffering afflicting many parts of the world, there is perhaps more reason to be optimistic about the future than there was a century ago. Professional weapons cost more and more, in part because they are built and maintained by institutions, vested-interests with little real concern for the defence of their states. As the pendulum swings back to amateur weapons and tactics, we might hope that out of the chaos more real democracy and freedom will eventually emerge. But don't expect the tyrants to sit tight while the levers of authoritarian control slip from their hands. Expect the tyrants to fight back. Expect the tactics and weapons of amateur warfare to be controlled, restricted and outlawed. Watch out. They won't go quietly.

Chapter 8

Promises

Do you understand money? Sure, you understand that people want to have money. You understand that more money is better than less money. But can you explain why? Oh, that's easy, you might say: people want to have money because of the things that they can buy with it. True, but that doesn't properly answer the question. Why are the people who sell those things happy to take your money in exchange? What is it that makes the money valuable? Take some money out of your purse and have a close look at it. What do you see? A bank note is a slightly odd but very detailed artwork printed on high quality paper. If it were a limited edition, it would certainly be worth a lot. The craftsmanship is extraordinary. But that's not what makes it valuable: there are millions and millions of these notes. Almost everyone has a few; some people have lots.

So what's going on? Most people can't deliver a very convincing answer to this question. It's even worse if you ask them to explain how banks work. There is a short answer to these questions, which I'll give you now, though it will not mean very much until later in this chapter, when you understand the long answer. The short answer is that both money and banks are fundamentally a confidence trick. They rely on people having confidence in them for them to keep on working. Money is essentially a promise, usually from a government but sometimes from a corporation, a promise that in the future the money will be worth something real. A bank is a place to store promises and to keep them safe for the future, but more than that, it is a place where promises can be transformed and even invented out of nothing.

I expect you will agree with me that the short answer is not really very enlightening if you don't already understand it. We need the long answer. We need some concrete examples. Let's begin with a fairytale example, set in a rural landscape, maybe in the "dark ages" after the fall of the Roman Empire or maybe in some survivalist post-apocalyptic future. There are farms and villages, people have the basics of life, but there is no money. How does the "economy" work?

People can grow or make most stuff that they need for themselves. When they can't make it for themselves, they can swap some of their stuff for whatever they need: they engage in **barter**. Even if they can make a particular thing for themselves, they might decide not to, they might barter instead. Suppose you need a basket. Rather than make it yourself, you know someone who is better at basket

making than you, so you ask them to make one for you. You on the other hand have something they would like. Maybe you keep rabbits or chickens, so you can do a swap at what you both consider to be a fair rate, say one dozen eggs for a basket. Or it might work out that you get the basket today and what they get in return is a promise. Maybe you promise to help them repair the door of their barn, a two-person job that they can't do on their own.

This promise, floating between the minds of two people, is like the spirit of money, almost condensing into reality, but not quite there. Since it has no material existence, it relies on individual memory and reputation. It's difficult to pass a promise on to someone else. To see the difference that money makes, we need to introduce two technical inventions: the **shop** and **token coinage**.

Let's suppose that some particularly well-endowed farm decides to open a farm shop, where people can come and get what they need "off the shelf." Need a basket? Fine, we have just the thing here. How would you like to pay? Shall we say one dozen eggs? A shop like this has some advantages, provided it carries enough stock. You don't have to search for other people to barter with, you can just go to the shop and find the thing you want. And there's the added attraction that you can sit out of the rain and gossip with other shoppers.

It's not entirely satisfactory though. Suppose you want something more substantial, some gizmo that's worth half as much as a sheep. Maybe you even have to put in a special order and wait for the gizmo to be delivered next week by the craftsman from the other side of the woods. Why not go directly to the craftsman? Well, for one thing you'd have to walk to the other side of the woods, but the main reason is that the the craftsman has no interest in sheep. Sure, the gizmo is *worth* half a sheep, but the craftsman has enough sheep. He wants something else. You only have a sheep. So the shop provides both of you with a valuable service: you give the shop what you have and you get the gizmo, the shop gives the craftsman something else that he *does* want and in return gets the gizmo to pass on to you. This is great, but there's a problem. The gizmo is only worth half a sheep. What does the shop give you for change? Chickens?

This is where the second technical invention comes in: token coinage. Let's have the farm shop make some coins in its workshop. Maybe they have the stern face of the proprietor on one side, and on the reverse, the inscription "One Farm Dollar." How much are they worth? The farm shop has a blackboard behind the counter, like the "specials" menu on a restaurant wall. It says something like this:

Basket	\$1.00
1 doz. eggs	\$1.00
Sheep	\$50.00
Gizmo	\$25.00
<i>... and so on ...</i>	

Now the answer to the question of what you get in change is quite simple. You get 25 Farm Dollars, which you can spend today in the shop, or you can keep them in your purse and come back another day. Or — and this is where it gets really exciting — you can use them to buy something *outside* the farm shop. Maybe you buy a basket from your neighbour, and in return you give them a Farm Dollar. Your neighbour is happy to accept this because they believe that they can go to the farm shop any time they like and redeem the Farm Dollar for something of real value. Something like a dozen eggs. We have just invented money.

This token coinage is a promise made concrete, a promise that you can pass on to someone else. Ultimately, it's a promise of real stuff from the farm shop. So long as people have confidence in the farm shop, the token coinage is worth something. Specifically, it is worth what the blackboard behind the counter of the farm shop says it is worth.

Well, almost — there are subtleties here, aren't there? For a start, the farmer *sells* at those prices, but he probably has another list, with slightly lower prices, when he's buying. (Financial geeks call these the **offer** price and the **bid** price respectively.) It's one of the ways that the farmer can extract value for himself, effectively charging a slight commission on each sale.

Another subtlety is that the farmer needs to set his prices at a level where he maintains some stock — if he has no stock, the Farm Dollars have no value. He can't just pick prices out of the air. He needs to find prices where customers are happy to buy from him and suppliers are happy to sell to him.

Suppose, for example that there is a general glut of eggs. I'll sell as many eggs as I can to the farm shop at their bid price. When they don't want any more, I'll sell the rest to other people at whatever I can get. Maybe I'll offer you two dozen eggs for a Farm Dollar. Since they won't keep, it's better than feeding them to the pigs. If this goes on, the farm shop will have to lower the price on the blackboard, or else no one will buy eggs from them.

Similarly, if there is a shortage of eggs, and the farm shop keeps the same price, they will run out of stock. In that case, I'm not going to sell eggs to the farm shop, because I expect that you will come to me and be prepared to pay more, maybe one dozen eggs for two Farm Dollars. When they see that they can charge more for eggs, the farm shop will naturally raise their price, to reflect whatever "fair price" has been established in the community.

In a way, the community is doing the farm shop a favour. People buy and sell outside the shop and that way they come up with a fair price. The owner of the farm shop doesn't have to work out a fair price from first principles, they only have to observe what the community has decided. (This is what is meant by Adam Smith's "invisible hand," guiding people to choose the right price for things, without ever needing to have kindly feelings toward one another.) In this way, the prices on the blackboard for different goods vary independently, depending on

their scarcity.

But there's another subtlety, one that affects all prices together. Before long, human nature being what it is, the farm shop will start to suffer from a problem that afflicts all money sooner or later: counterfeiting. Someone else with a workshop will carefully examine the Farm Dollars, quietly obtain the raw material and mint some look-alike counterfeit coins. It's well worth understanding exactly what the crime is in this case. The Farm Dollars are a token coinage, which means that they have very little *intrinsic* value. (Just like the coins and notes in your pocket right now.) The value comes almost entirely from the fact that they represent promises: the promise of something real from the farm shop. It would be best if they were unforgeable, but in practice anything that can be made by one person can be forged by another, it's just a matter of effort.

So what's the crime? The crime is theft, initially from the farm shop and ultimately from all its customers. The counterfeiter gets to buy things from the shop at the current fair price written on the blackboard. If he walks in with 100 counterfeit Farm Dollars, and walks out with two sheep, then he has stolen the sheep from the farm shop just as much as if he had walked in with a gang of thieves and taken them by force. Counterfeiting, like most scams, is just a low-violence form of mugging. The counterfeiter doesn't even have to go to the shop himself. He can buy things directly from you or me. Eventually *we* will go to the shop. The same theft happens, just indirectly, provided that the price on the blackboard doesn't change in the mean time.

Maybe this theft doesn't seem so bad — after all, it's the rich proprietor of the farm shop who suffers. He's got so much stuff to start with, what difference does it make? Maybe you think the counterfeiter is an anti-capitalist freedom fighter. But wait. The counterfeiter has walked off with various real stuff in exchange for his fake Farm Dollars, so there's less real stuff for everyone else. With enough counterfeit Farm Dollars, there will start to be shortages, and when there is a shortage, as before, the prices of things will go up in the community and on the blackboard at the shop. At that point the theft isn't from the farm shop any more, it's from the rest of us. We've got **inflation**.

The benefit of counterfeiting went to the first person who spent the fake coins, while the prices were still at their old level. The cost of the counterfeiting is spread over the whole community as prices rise. The people who suffer the most are the ones who spend the money in their purses last, paying the highest prices.

If the proprietor of the farm shop is unscrupulous, he will notice a clever variation on the counterfeiter's crime, a way to steal from the community and enrich himself. The proprietor can "counterfeit" his own coins. Of course, he doesn't really need to counterfeit them, he can just get his workshop to turn out more and more real coins. They don't cost much to make — they are just tokens. He gets the benefit of spending them first at the old low prices. Maybe he builds up the stock

of the shop. Maybe he lives in a grander style. Maybe he uses the money to pay for a new barn, or he buys another plot of land. The proprietor has to be careful not to over-do it. I think customers might be justifiably angry if they realised what was going on, if they worked out that the proprietor was inventing promises out of nothing, promises that could never be delivered at the old prices on the blackboard. They might turn up one night with pitchforks and flaming torches to help explain their point of view to the proprietor.

But temptation is difficult to resist. Is there any case in history where someone had the power to invent money out of nothing and resisted that temptation for long? Really, it would be better if there was some way to make it more difficult to invent money out of nothing. A good way to achieve that is to make coins out of something that's intrinsically valuable, for example gold or silver. With gold or silver coins, neither outside counterfeiters nor the proprietor can easily make new coins in arbitrary numbers. First they need to get the metal, and if it takes a week's effort to mine the gold to make a coin, that's a huge disincentive to the counterfeiter. They might decide that it's better to spend that week preparing for some other crime, or even to engage in honest work.

In practice, the value of coins made from precious metal often exceeds the value of their gold or silver content — they remain in part a token coinage. The reason for this is quite easy to see if we take the example of the Roman Republic. The silver denarius was about 85% silver, but its purchasing power fluctuated around twice the value of its silver content. Why? There were only so many denarii, but there were lots of things to buy. In particular there were lots of slaves, captives from the Republic's many wars of conquest. In the slave markets of Rome, the prices "on the blackboard" were in denarii. The promise of the denarius was that the wars of conquest would continue, that the slave markets would always be full, that there would always be people to buy with your denarii.

So, gold and silver coins have the advantage that their precious metal content acts as a brake on both counterfeiting and on outrageous production by the official mint. There is still a problem: the coins will not be pure metal. Both gold and silver are too soft in a pure form to make a robust coin. They need to be alloyed with other metals. But in what proportions? There remains an opportunity for counterfeiters, melting genuine coins and making fakes with a lower purity.

If there's an opportunity for counterfeiters, there is even more for the official mint that makes the coins. The Romans didn't invent banking, so they couldn't use the modern tricks that you will learn about shortly. They thought money was just coins. But in the third century A.D., the Roman Empire suffered from the most devastating and persistent inflation. The Republic was history, the wars of conquest were long over, and with them the well-stocked slave markets. The Empire was merely trying to hold back throngs of envious barbarians behind its borders. The army protecting those borders had to be paid, and the soldiers ex-

pected an extra bonus on the accession of each new emperor. By the third century, these emperors were hopeful military dictators who lasted on average about three years before the next coup swept some other general into power. Taxes were extortionate, enough to put farmers out of business and drive them off the land. But still the state could not gather enough money to pay the troops and the government administrators.

So they debased the currency. The denarius had been 85% silver for hundreds of years, but now the silver content was steadily reduced until eventually the coins were nearly 100% bronze, quickly dipped in molten silver to give them the right colour. Even that was not enough, and coins were over-struck in the imperial mint with a stamp indicating that they were now of a higher value, like banknotes in Zimbabwe with more and more zeroes on them. The silver coins had been transformed into an empty token coinage, promising nothing. Since people needed currency for buying and selling they had to use it, but they suffered from the tremendous inflation. Cities also produced their own token coinages, even though this was illegal, so that local economies could function, and of course these suffered from inflation too.

At one point the Roman state even repudiated its own issue of gold coins — state-issued gold coins were no longer accepted for payment of taxes. Only pure gold bullion would do. (The fundamental reason for this was that some barbarian tribes were employed as “muscle” to guard the Empire’s frontiers, and they refused to be fobbed off with coins of uncertain metal content. They insisted on being paid in bullion.)

So, you can have inflation with a gold coinage if the purity of coins is not maintained. But you can also have inflation even when purity *is* maintained. Europe discovered this when the Spanish and Portuguese spent the gold and silver that they stole from South American empires following their discovery of the “New World.” This gold and silver was imported in huge quantities. It was suddenly very much easier to obtain — its previous owners, devastated by disease, were forced to surrender it to the Spanish. After that initial gold and silver was taken, the remaining inhabitants were put to work as slave labourers, mining new metal from the ground. Newly minted coins flooded out across Europe, bringing material goods to the Spanish and Portuguese, but in the end, inflation to everyone. The merchants were perhaps more fortunate than their customers, since when all the gold and silver was spent the customers had little to show for it, but their suppliers had the businesses, farms and workshops they had built to meet the demand. This lesson has not been lost on the Chinese in recent years.

In contrast, when we look at the the nineteenth century, despite an increased supply of gold, there was no general inflation. Prices in gold were stable or even falling during the century, despite the discovery of new gold and silver deposits around the world and the application of industrial technology to extract these

metals from the ground. Why was there no inflation during the nineteenth century? Not, as some people suggest, because of the inherent virtue of gold currency. The true answer is that although there was more gold in the nineteenth century, there was also much more stuff to buy with the gold. In the sixteenth century there were only slightly more material goods to buy with the new gold, so prices rose. However, in the nineteenth century, the supply of material goods expanded exponentially. Rapid industrialisation, first in Britain, then around the world, brought a bonanza of useful things to spend the new money on. The two effects more-or-less balanced out.

In a sense this was a lucky coincidence — it certainly wasn't planned by anyone. The quantity of gold tended to grow at a rate similar to other industrial production because if there was a shortage of gold, people would be able to make more profit by using their technology to mine gold, rather than coal, iron ore or something else. Investment would follow the best returns, a feedback loop keeping the growth of gold currency more or less in line with the increased production of other industrial products.

You now know quite enough about the basic properties of money. It's time to introduce that distinctly mixed blessing, the **bank**. Let's return to our fairy-tale world with the farm shop, but turn forward the hands of history by many decades. Life has been kind to people. The countryside is productive. Towns have developed, with workshops and guilds. Local quasi-states gather taxes and issue gold and silver coins from their mints. Counterfeiting happens, but it's punished severely, for example by castration or death, so it's not a serious problem.

Let's suppose that you live a prosperous life in one of these towns, and you have a small stash of gold coins. You could keep them under your mattress, or in a strong box, but there's always the danger of theft. It must be possible to do something better with them. You could put them in a bank, and in this world there are two kinds of bank: the "money scrivener" and the "goldsmith." Let's look at each of these in turn.

The money scrivener is a kind of financial match-maker. When you go to a money scrivener, he will take your cash and give you in return a **bond**, which is just a fancy name for an "IOU" with a "not before" date. This document promises that the money scrivener will return your original money plus a specified amount of **interest** on some particular day in the future. For example, you might invest 100 dollars, at 10% interest and the bond will promise you 110 dollars when you present it back to the money scrivener one year from today. You can't get the money back in the mean time because the money scrivener is going to loan it out to some businessman.

The money scrivener makes a mirror-image deal with that businessman. Say the businessman is a cobbler who has taken on an apprentice. With the extra help, he can now make and sell more shoes, but first he needs to buy more leather,

and he doesn't have enough spare cash in his business. So he goes to the money scrivener, who gives him 100 dollars right now, and in return he signs an IOU, promising to pay back 120 dollars on that day in one year's time. On the birthday of the bond, the money scrivener will then be able pay the 110 dollars he owes you, and he will have 10 dollars profit for himself.

Sometimes a deal will go sour and the businessman won't be able to pay back all or even any of the debt. If the money scrivener thinks there's a risk of this, he can ask for **security** when he makes his loan — he can make sure that the businessman forfeits something valuable if he can't come up with all the money. But none of this is your concern. The money scrivener has personally promised to deliver your investment back to you with interest, regardless of what might go wrong. It's his problem to sort out the details with the businessman.

Notice that you can't get your money back before the **maturity** date on the bond: the money scrivener doesn't have it, and doesn't claim to have it. Some businessman has it, or more likely several businessmen have part of it. You might, if it is a **bearer bond**, be able to sell the bond to someone else before the maturity date, but there's no guarantee of that, or what price they might pay. If you do sell it, whoever buys it will still have to wait until the maturity date to get their payout from the money scrivener.

A bond needn't be for a year, it could be for any fixed period, but the interest on short-term loans will be small. (If it takes six months for a business to transform your money into real goods and sell those goods, few businessmen will be interested in short-term loans.) What if you don't want to lock your money up for a fixed period with a money scrivener? Maybe you want to be able to get your money back the day you need it, on demand. If that's the case, you need the other sort of banker, someone with a good strongroom and guards to keep it safe for you until that day. In our fairy-tale world, that someone is called a "goldsmith," because they *are* a goldsmith. Their main business is making and repairing gold jewelry, but because they have a good strongroom and guards, they can make a business on the side looking after other people's valuables.

Unlike the money scrivener, the goldsmith *charges* you to keep your gold in his strongroom. This is just like having a safe-deposit box in the modern world, or like a self-storage facility. When you make a deposit, the goldsmith gives you a ticket, which is essentially a warehouse receipt for your cash. Often, these tickets don't have the depositor's name on them, so anyone can redeem them for cash. This has the interesting consequence that goldsmith's tickets can be used as money: rather than paying for something with gold coins, just give them some goldsmith's tickets for the right amount. They can redeem the tickets later, or spend them in turn. (Modern British bank notes still have written on them the phrase "I promise to pay the bearer on demand the sum of . . ." This is a remnant of their original function as goldsmith's tickets.)

Another interesting aspect of the goldsmith's business is that people presenting tickets don't care whether they get their original coins back in return. (If it was originally someone else's ticket, you certainly don't care.) Provided the coins are authentic, with the correct gold or silver content, that's all that matters. And in fact, who would be better placed to check the quality of the coins than a goldsmith? People might actually be happier to be paid with a goldsmith's ticket than with coins, because the coins represented by the ticket would be of guaranteed quality.

At this point, you are probably about to say, "Yes, but . . ." How do you know that a goldsmith's ticket is itself authentic? Isn't this just like the farm shop all over again, isn't there going to be a problem with counterfeiters? Yes, there is. Goldsmiths can't employ the best countermeasure, which is to make their tickets out of precious metal — that's what they are warehousing! Instead, they make their tickets out of special-quality watermarked paper, with very high quality printing. They are numbered and signed. It may even be customary for people to sign the ticket on the back when they spend it, so that counterfeit notes can be traced back to their origin. (This practice persisted with Bank of England white five pound notes until only a few decades ago.) The goldsmiths can also get help from the law-courts, if forging their tickets is officially classified as counterfeiting. Forging a goldsmith's ticket would then be just as risky as counterfeiting the official gold and silver coins, with the penalty of castration or death.

Now, I've deliberately brought you in at crucial turning point in the fairy-tale world. We are about to step off into the abyss which is traditional banking. Some goldsmiths have started to warehouse gold coins for free. Others are even paying a small amount of interest on deposits. They can do this because they have decided to loan out some of the gold in their strongroom for interest, just like a money scrivener. The customers holding goldsmith's tickets know this, but for now they are happy, because they can still take their cash out on demand. Since they can take it out any time, they mostly want to leave it where it is, especially since it is now earning interest. What could possibly go wrong?

If you have seen newsreels from the 1930s, or if you were in one of the queues outside the British bank Northern Rock in September 2007, you will know exactly what can go wrong. The goldsmiths' clever new scheme is in fact a scam, a confidence trick. Provided everyone has confidence in the goldsmith's tickets, things continue just as before. But when people think "maybe there isn't enough gold in the strongroom to pay back *my* ticket," then the game is up. Everyone with a ticket turns up at the same time, and now there *isn't* enough gold to pay everyone. The goldsmith goes bankrupt, and any remaining tickets are more-or-less worthless. We say that there has been **a run on the bank**.

Can you put your finger on exactly what went wrong? An accountant would say that the problem was with the time-structure of the goldsmith's assets and liabilities. The goldsmith's assets are the gold in his strongroom, plus the IOUs

from businessmen promising to pay back loans with interest in maybe a year's time. The goldsmith's liabilities are all those tickets, each promising to pay the bearer a certain amount of gold *on demand*. Right now, not a year from now. When there is a run on the bank, the goldsmith can make good on the first few tickets, but there comes a point when the strongroom is empty. To make good on the next ticket, he needs to get money back from one of his loans, but that is locked up for a year. Perhaps he can sell the IOUs for those loans, but that takes time, and he probably won't get their full value anyway. In modern British law, there are two ways to be bankrupt, and the goldsmith has just illustrated one of them: he is unable to pay his debts as they fall due. It was all a problem of timing. In a way, the goldsmith was always bankrupt by this definition, because he was always liable to pay out on the tickets before he had the money back from his loans. The goldsmith was pretending that money could be in two places at once.

There is a positive side to this. The goldsmith engages in this confidence trick because he makes more profit, but the scam also helps other businessmen, and perhaps indirectly the whole community. People always had the choice of putting their money into a bond with the money scriveners. Some of them thought that they might need their cash back at short notice, so they took it to a goldsmith instead. But money in a goldsmith's strongroom just sat there, unlike money scrivener's loans which were used to help make more real stuff in the world, the stuff that is the fundamental reason why money is worth anything in the first place. The goldsmith's confidence trick takes this idle money and puts it to work. The goldsmith's depositors have become half-willing investors in local businesses. But only half-willing. Like most scams, they are happy to go along with it while they seem to be getting something for nothing.

But the goldsmiths face another temptation, rather worse than loaning out their gold. Since goldsmith's tickets are being used as money, rather than loaning out gold, why not just print some new goldsmith's tickets and loan those out instead? From the goldsmith's point of view, this is better because there's an obvious limit to how much gold they can loan out: the limit is all the gold they had in their strongroom. There is no such limit on the number of tickets they can issue. They could issue five or ten times more tickets than their stock of gold. This is known as **fractional-reserve banking**. The goldsmith only has a fraction of the cash reserves needed to make good on all the tickets.

Is this legal? Isn't it a kind of counterfeiting? There never was any cash to pay out on one of these invented tickets. At the very least surely it is fraud? The honest answer to these questions is to say, yes, this is like counterfeiting, it is a kind of fraud. And yet this is exactly how traditional banking works. We have now entered the abyss. Essentially all banks are fractional-reserve banks. Why don't the bankers go to jail? Because the law is written specially for them, to say that it isn't counterfeiting, that it isn't fraud, if *they* do it. Other businesses can't

do it, you and I can't do it, but a bank can.

This is interesting, but perhaps even more interesting is the fact that you are now part of that very small minority of people who understand how it really works. You probably have a slightly queasy feeling that this can't *really* be how banks work. Surely they take some people's cash and loan it to other people, like money scriveners, or at least like those unambitious goldsmiths who loaned out their gold? But no, banks really do invent money out of nothing, just as goldsmiths invented tickets out of nothing and loaned those tickets out for interest. The only difference is that in our world the goldsmith's tickets are called **banknotes**.

This is the central scam of banking, but there are many extra subtleties. One is that the goldsmith need not issue tickets, but he can still play the same tricks. Suppose that instead of issuing tickets, the goldsmith keeps track of deposits in a big accounts book, one page per customer. Customers can transfer money to other people by using a **bill of exchange**, also known as a **cheque**. This is an instruction to the goldsmith to move money from my account to yours, something like this:

*To Mr G. Smith, One Goldsmith Lane, London.
Please move one hundred pounds from my account
to the account of Mr A. N. Other.
Signed,
A. Person*

So, rather than a goldsmith's ticket moving from my purse to yours in the outside world, a clerk executing this bill of exchange subtracts a number from my account book page and adds it to your account book page inside the goldsmith's building. The goldsmith can still invent money out of nothing simply by adding a number to your account book page, in return for your IOU which he keeps in the strongroom until its maturity date. On that day, you pay back the IOU by telling him to subtract the money you owe from your account book page. Invented goldsmiths tickets and invented numbers on an account book page are exactly equivalent. (Though it took economists most of the nineteenth century to work this out. When laws were passed regulating the issue of banknotes, the bankers simply moved on to another technology and ran their scam with account books.)

Another subtlety is how best to prevent a bank run. A key piece of theatre is to make the building containing the bank as imposing and monumental as possible. It should either look so solid that it would comfortably out-last the pyramids, or else it should show conspicuous disregard for expense, a temple of glass, chrome and marble. The employees should be sober and serious. The directors should be pillars of society, beyond reproach. As with all scams, a proper disguise is vital.

To prevent a bank run gaining momentum, it is vital to have enough cash on hand to always pay out promptly. How much is enough? Through the centuries,

experience has shown that it is prudent to keep one dollar of cash on hand for every five banknotes which promise to deliver one dollar “on demand,” a **reserve ratio** of 20%. Now, prudence is not compulsory, so from time to time governments have imposed particular **reserve requirements** by law. The fraction of reserves to banknotes demanded during the twentieth century has generally ranged from the prudent 20% to the rather lax 5%. This last figure is only really practical with government connivance and the help of a **central bank**.

A central bank is a bank which has a special relationship with the government. Sometimes it is entirely controlled by the government. (As is the Bank of England nowadays, though it was for centuries privately owned.) Sometimes it is regarded as part of the government, even when it isn't. (This is the case with the United States central bank, the Federal Reserve.) Sometimes it is independent of government, but has special privileges not given even to other banks. (This is the case with the European Central Bank.)

A central bank is expected primarily to do things which benefit its government, for example creating money out of nothing and lending it to the government. Secondly, it is expected to act as an overseer and **lender of last resort** for other banks. The idea of this is that when an ordinary bank suffers from a bank run, it can get a short-term cash loan from the central bank which saves the day. This is the government connivance which allows other banks to survive with the otherwise suicidal reserve ratio of 5%.

In return for these services, the government writes special laws to protect the central bank. For example, central bank notes may be declared **legal tender**, so people cannot write contracts specifying payment only in cash. People have to accept payment in the central bank's notes. The government can temporarily “suspend specie payment” on the central bank's notes, so people cannot redeem the notes for gold or silver coins, but still have to accept the notes as legal tender. It should be obvious how useful *this* is to the central bank. (Today, around the whole world, specie payment is suspended, and has been for around 60 or 70 years. This is a long time, but it's still best to regard this as a temporary measure, since it's historically unusual, and in the long-run unstable.) The government can even suspend the usual requirement that each year a business must have its accounts audited. The US Federal Reserve has not been audited for decades. Oh, and of course as a central bank you still get to do what all other banks can do, namely to invent money out of nothing. When you are a goldsmith it's nice to have the government on your side, isn't it?

The relationship between government money and bank money is especially confusing, particularly when central banks are involved. Throughout history, governments have minted gold and silver currency, and they have also minted token coinage and printed paper money. Really, there is no difference between government paper money and token coinage. Governments resort to such **fiat currency**

in times of existential crisis, from the Roman Empire's not-really-silver denarii, to "Continental" government notes in the American War of Independence, or the "greenback" government notes of the American Civil War. These were all really just token coinage, created in unlimited quantities, with essentially the same result: tremendous inflation.

So people prefer government coins with a substantial content of gold or silver. That way a government can't continually create more coins out of thin air. They have to go to some effort to obtain the precious metal, which acts as a natural brake on the production of coins. And yet governments need more money. Perhaps it is now clear why central banks are so useful to governments. They let governments have some of the advantages of a token coinage without the usual consequences. The central bank looks respectable, and it isn't the government, so people are more inclined to trust its banknotes. The central bank doesn't indefinitely print more and more banknotes, it keeps to some plausible reserve ratio, so this is genuinely an advance on government token coinage. With government protection the central bank is largely immune to bank runs.

It's worth thinking about *why* a central bank bothers to maintain some particular reserve ratio. Since it's protected from bank runs, why doesn't it just keep the printing presses going and churn out more and more banknotes? If there was only one state and only one central bank, then this is almost certainly what would happen. There would in fact be no difference between government paper money and central bank paper money. Before the twentieth century, the world-wide **gold standard** ensured that the check on each central bank came from outside, from other states and their banks.

Although each state could make a law that their own central bank's notes were legal tender, and could even suspend specie payment, these laws obviously didn't apply to foreign countries and their banks. When merchants in one country imported goods from a foreign country, how did they pay? If they used central bank notes from their home country, these notes would pass from bank to bank in the foreign country until eventually some bank (usually the foreign central bank) presented them back to the central bank in the merchant's home country. Even if specie payment had been suspended for ordinary citizens at home, the central bank in the merchant's home country had to redeem its notes for gold when foreign banks presented them — that was what the gold standard guaranteed. Otherwise why would anyone ever accept a foreign banknote? Notes which were not backed by gold were regarded quite rightly as empty promises, easily made and easily broken.

Now, when there was trade both ways between two countries, the central bank in each country would accumulate a stack of foreign central bank notes. If the value of trade in both directions was equal, there was no need to transfer gold — the central banks could just swap their stacks of banknotes. But if there was

more trade in one direction than the other, then the reserves of one central bank would run down. Eventually, the reserves might run out completely. Economic life might continue inside the “bankrupt” country, but external trade would come to a halt when the country found itself no longer able to pay for imports. This is how the gold standard effectively restricted the ability of central banks to create money without limit.

Faced with the prospect of exhausting their reserves under the gold standard, a central bank or its government might take one of a number of compensating steps. The government might pass laws to encourage the export of goods, hoping to collect in return a bigger stack of foreign banknotes so that the swap of notes would be more even. The government might pass laws to discourage the import of some goods, either by taxing them, setting quotas or making them illegal. Or the government could pass laws restricting the export of banknotes themselves — so-called “exchange controls.” More dramatically, the government could launch a war, with the intention of seizing control of some resources of value to foreign countries, and balance imports and exports that way. The problem with all these measures is that they tend either to be unpopular with foreign countries, and provoke tit-for-tat retaliation, or to be unpopular with with the merchants at home, who often form a significant portion of the government’s supporters.

So, under the gold standard, governments usually preferred that central banks solve the problem themselves. The central bank might declare that its banknotes were **devalued**, or in other words, would be redeemed for less gold than it had previously promised. However, this was considered dangerous because foreigners might wonder if one devaluation would be followed by another, and another. This lack of confidence could be self-fulfilling, and the banknotes might end up being worth a lot less than intended.

A more reliable solution was to build up the reserves of the central bank by offering a higher rate of interest on deposits. That would tend to bring in gold from abroad, and so the reserve ratio would return to a more prudent level. As a side effect, it would also tend to curb general bank lending in that country, because other banks would be forced to increase their interest rates too. (If any bank can benefit from the central bank rate just by making a deposit there, why would they lend out to businesses at less than that rate?)

Central banks and governments don’t always agree about what to do in such circumstances, or even tell each other the truth. For example, in the 1920s, the head of Britain’s central bank, Montagu Norman, persistently lied to the government about the amount of its gold reserves. Britain had suspended payment in gold during the First World War, even to other central banks. In 1925, Britain returned to the gold standard, and the Bank of England quickly began to build up gold reserves. It should have reduced its interest rates, to be less attractive to foreign gold. Under the high interest rates, businesses struggled and ordinary people lost their

jobs. But Norman liked the high interest rates, because they caused deflation (the opposite of inflation). The main asset of a bank is money, and that money is worth more when there is deflation. Norman decided to hide the excess gold with some accounting tricks, the connivance of banking friends in New York, and outright lies.

Here is an example of what Quigley meant by the sovereign power of “money control.” At that time, the Bank of England was a privately owned bank, and Norman was a private citizen. Everything the Bank of England did as a central bank was governed by the deal it cut with the government, as set out in legislation. Norman broke that deal and seized money control for himself. Only a handful of people knew the truth. The Bank’s “Court,” its board of directors, were just as much in the dark as the government. There is no doubt that if Norman’s actions had been known at the time he would have been sacked or worse. (What he did was essentially treason.)

So, the gold standard was not a solution to all problems with money, not proof against all deception by bankers, but it did impose some worthwhile limits on the capacity of central banks to invent money out of nothing. But you will notice that I am speaking in the past tense. The gold standard is no more. What happened?

The gold standard, which formed the backbone of international trade in the nineteenth century, stuttered in and out of existence in the first decades of the twentieth century. Most people agreed that it was a good thing, but the pressures of war or economic depression meant that it was sometimes a good thing that would have to wait for better times. After the Second World War, the United States held the majority of the world’s official reserves of gold, and the victorious Allied nations agreed on a new system of money which was not quite the old gold standard. The United States defined its dollar to be 1/35 of an ounce of gold, and other countries defined their currencies in terms of the dollar. (However, *inside* the United States, people were not allowed to own gold bullion or coins. All the circulating gold coins had been confiscated by the government during the 1930s banking crisis, after which they were melted down into ingots and stored in Fort Knox.)

For a while this new system seemed to work, but by the late 1950s things were clearly going wrong. In 1958 the total dollar holdings outside the United States were around \$20 billion, up from \$10 billion, ten years earlier. Over the same period, the United States’ gold reserves had dropped from \$25 billion to \$20 billion, at the official rate. Clearly the United States as a whole was spending abroad more than it was receiving, but neither the government nor the central bank took effective steps to change this. Under the new system of money, foreign central banks could still ask for gold in return for their dollars, and seeing that there was only just enough gold to make good on all the dollars they held, this is exactly what they did. It was like a very slow bank-run.

Eventually, on 15 August 1971, President Richard Nixon “closed the gold window.” The United States defaulted on its promise to redeem dollars for gold. About half of the 1958 gold reserves had been spent attempting to preserve the value of the dollar, but now the charade was over. This left significant questions about what the dollar was now worth. Surely the result must eventually be inflation and ruin?

In 1973, the Kuwaiti oil minister put the issue quite succinctly when he asked: “What’s the point of producing more oil and selling it for an unguaranteed paper currency? . . . Why produce the oil which is my bread and butter and strength and exchange it for a sum of money whose value will fall next year by such-and-such a percent?” A very good question, and a question which must have had a very convincing answer, because of what happened next.

The oil-producing nations, including Kuwait, arranged to be paid much more for their oil, but they also arranged to be paid exclusively in dollars, despite the fact that it was an “unguaranteed paper currency.” This is an arrangement which persists to the present day. We do not know exactly what convinced the oil-producing nations to make this choice or why they have stuck fast to their choice despite the dramatic inflation which the dollar has suffered in the meantime. (Depending on who you believe, the dollar lost at least 80% of its value, maybe even 95% of its value, between 1973 and 2011.) For the United States, the benefit was clear: the dollar, although not backed by gold, was now effectively backed by oil. The prices on the blackboard were in dollars and if you wanted to buy oil you needed to come to the shop with dollars in your pocket.

Because of this odd arrangement, the United States dollar continues, as I write, to be the world’s reserve currency, and the United States central bank has been able to create dollars without limit. Since the 1970s, these invented dollars have puffed up one financial bubble after another, not only in the United States but all over the world. So far, as each bubble has burst it has been replaced with another, bigger bubble. Each time, the bubble machine itself has survived the crash, because that suits the narrow interests of the American establishment as they play their infinite game of wealth. As I write these words in 2011, the situation appears to be getting more and more precarious, but seeing into the future is always uncertain. It’s hard to say when the bubble machine will finally stop forever. Maybe when you read these words, it will have already stopped.

What then? Would it be a good idea to establish something like the gold standard again? Looking back at history, whenever governments have tried to base their currency on something other than gold or silver this has always been unstable and temporary. It’s surprising that the United States has managed for so long. However, despite the enthusiasm of some people for currency based on gold and silver, it’s not clear that we could ever really have a gold standard again. To explain why, I need to tell you a story. It’s a story that also pulls together most of the ideas that we have met so far, a story of blood and gold.

Part III

Time: Past and Future

Chapter 9

Blood and Gold

Almost by definition, our Western civilisation has its main focus on the Atlantic. There's the warm and sunny axis from Spain to the Caribbean and South America. There's the cold and foggy axis from Britain to Newfoundland and North America. Either way, the Atlantic is there at the centre. It's easy to imagine that this is everything, and to forget the history that happened around the curve of the earth.

To us in the "West," the crucial, devastating events of the past century are the two World Wars. It seems as though up until the turn of the twentieth century, everything was going fine. The states of Western civilisation fought wars in the nineteenth century, but they were much more limited, less devastating than those of the twentieth century.

In a sense, the First World War was really a civil war between the component states of Western civilisation, a crisis at the end of a century of expansion. And in a sense, the Second World War in Europe was, as predicted by Ferdinand Foch, really just the First World War continued, after a "twenty year armistice." But there was another war, the other side of the world, that just happened to culminate at the same time. We call the final stage of that other war "The Second World War" too, but to a significant degree that was just a coincidence of timing.

Around the curve of the earth, two other civilisations tell a very different story about *their* crucial century, the years from about 1850 to 1950. The Chinese story runs from the humiliation of the Opium Wars, through years of disintegration, to eventual liberation by the Communist Party. The Japanese story runs from the humiliation of the Black Ships, through years of expansion, and ends with the hammer-blows of the first atomic bombs.

Neither of these stories is completely true, but that's not the point — for the Chinese and Japanese their respective stories are central. From the perspective of the Atlantic, the stories are peripheral, so they are misunderstood and forgotten. Both of these stories take a dramatic, 180 degree turn in the early 1940s, due to an intervention by America. It's an intervention that's easy to misunderstand if you don't appreciate the two stories of China and Japan that led up to it. It's an intervention that still has repercussions today.

I want to use these less familiar stories from around the curve of the earth to illustrate some of the ideas we've seen in previous chapters. To what extent can establishment elites really plan and control their future? How bad can things

get when tyrants have control? Can we really recognise psychopaths in positions of power? And where is all the gold? The interwoven stories of China, Japan and America are long, but revealing. Let's spin the globe around and look more closely at those other stories.

Our tale starts in the United States — part of the Atlantic axis, but also facing the Pacific. The Americans have for a long time had a perspective on the Orient different to Europeans. President Theodore Roosevelt said in 1905 that “Our future history will be more determined by our position on the Pacific facing China than by our position on the Atlantic facing Europe.” He was not proposing a change of direction, but merely blessing the long-held sentiments of the American establishment which for over a century had made fabulous profits from the “China trade.” Unsurprisingly, this trade had been consistently supported by the United States government, and especially by the US Navy.

Even at the turn of the nineteenth century the Americans were trading sea-otter pelts, from Oregon on the Pacific coast, for Chinese tea, silk, cotton, porcelain, furnishings and art-objects. Such “chinoiserie” was essential for fashionable Americans and Europeans. When the Americans stole California from Mexico in 1848, the importance of China and the Pacific loomed even larger. Japan, which had shut itself off from the world for two and a half centuries, became suddenly important too. American sailing clippers, the fastest in the world, still took five months to sail from China to New England around the southern cape of Africa. By contrast, a steam ship from San Francisco could travel to Shanghai in six weeks. Japan was exactly en-route, Japan had fine harbours, and most important, Japan had *coal*.

It was essential that Japan was “broken open” on terms favourable to the United States, and Commodore Perry of the US Navy was sent to do the job. Perry had been hoping for command of the prestigious Mediterranean squadron, and was disappointed to be given instead command of the Far East squadron. This would probably be his last appointment before he retired. Vain and humourless — one sailor wrote that “no one appreciates a joke less than he does” — suffering from rheumatism and probably malaria, Mathew Perry decided to make the most of his new job.

The US Secretary of State was severely ill at the time, so Perry drafted his own orders and granted himself an extraordinarily wide remit. He was given the power to treat with the Emperor of Japan “without limitation.” Perry's squadron of two steam ships and two sail set off in late 1852. They took eight months to sail down the Atlantic, across the Indian Ocean and via Singapore, Hong Kong and Okinawa to Uruga Bay, close to the Japanese capital Edo (now Tokyo). When the “Black Ships” dropped anchor in Uruga Bay, it was the end of Japan's centuries-long seclusion.

Today, it's only in science-fiction that we find moments like this, moments

that in the nineteenth century happened in real life. The sailors on the ships, looking out at the alien shore might just as well have been in orbit on the Starship Enterprise. They were just as much in the unknown. For ordinary Japanese, with no warning of the ships, it must have seemed like the movie *Independence Day* — the ships were impossibly huge, driven by alien technology, apparently disregarding the forces of nature. The alien conquerors had arrived. Even today, in Japan the phrase “Black Ships” means only one thing: Perry’s ships.

Edo was at that time second only to London in size, with about one million inhabitants. Confusion and panic reigned. Everyone knew how vulnerable the city was to fire and to disruption of the rice-barges that brought food. People started to pack up their belongings and head for the countryside. The reaction of the Japanese establishment was equally confused, though more informed. They knew quite a bit about the outside world, and had advance warning of Perry’s expedition, although they chose to keep it quiet. Perry, on the other hand, knew essentially nothing about the political structure of Japan.

Japan had an “Emperor,” but although he had immense spiritual significance (being a direct descendant of the Sun god) he had no political power. He was tucked out of the way in Kyoto and left to conduct arcane rituals with his court. The real ruler of Japan was the Shogun, who had a very limited sovereignty over the many local lords. In a similar fashion to Louis XIV, the Shoguns encouraged obedience by insisting that the local lords and their families spend time at Edo, where they could be better observed and were effectively hostages. Although the first Shoguns, 250 years earlier, employed musket-armed soldiers as good as any in Europe, when they had brought the other lords to heel with European technology, they expelled the foreigners and started a process of disarmament. When Perry arrived, there were few guns left and the dominant weapon was the samurai’s sword.

The Shogun’s councillors had known about the increasing threat from the West for some time, even before they had specific news about Perry’s expedition. Japan was not entirely shut off from the outside world. After the Europeans had been expelled, the Dutch had been allowed to keep one trading post: Deshima Island, a small artificial island in Nagasaki harbour linked to the mainland by a guarded bridge. The Shogun’s main aim in excluding the Europeans was to keep out the Catholic church, which was quite sensibly considered a threat to sovereignty. (The modern Communist Party in China has exactly the same view.) Japanese Christians were persecuted until there were none left.

The Dutch were allowed a monopoly on the very minimal trade through Deshima Island because they were considered sufficiently anti-Catholic. As part of the deal they were required to provide an annual intelligence report about the external world. As the Japanese subsequently discovered, these reports grossly exaggerated the importance of the Dutch, but they were otherwise reasonably accurate. The recent foreign exploitation of China, which we will come back to in

a moment, was a clear example of how things could go wrong. Much less clear was how to effectively resist the foreigners. The Shogun's councillors debated this again and again. The situation was made more complex by the fact that when Perry arrived, the Shogun was very ill, near to death, and his chief councillor Lord Abe was trying desperately to hold things together and forestall what could easily become a civil war.

Perry knew nothing of this, but was determined to get the deal he wanted and not be brushed off. The Japanese, used to poking around foreign vessels that strayed into their waters, were driven off. American boats were sent out to survey Uraga bay, as though they already owned the place. Lord Abe issued orders not to provoke the Americans or give them any excuse to attack. Perry played the haughty ambassador, refusing to even meet minor Japanese functionaries in person. Perry had a letter from the American President addressed to the "Emperor of Japan" and he demanded to deliver it to someone of appropriate rank. The Shogun's council debated what to do, and eventually Abe prevailed on them to accept the letter.

And so, on 14 July 1853, Perry and three hundred marines landed on a beach in Uraga Bay, and with the marine band playing "Hail Columbia," marched up to a newly constructed building. Around the building and on the beach were maybe five thousand Japanese soldiers. Off shore, Perry's ships were at battle stations, decks cleared for action and guns ready to fire. Hidden beneath the building, a group of Japanese assassins waited for the order to cut Perry down. The situation was tense.

The Japanese dignitaries waiting in the building to meet Perry were actually the local governors, but they followed instructions from Abe to big themselves up. One pretended to be the "First Councillor of the Empire." Perry presented the letter from the American President. When the Japanese read it later, they were surprised to find that the letter was quite conciliatory in tone, and not really threatening at all. However, to avoid any confusion about his real intentions, Perry beefed up the President's letter with three further messages of his own.

In two codicils, Perry made threats and twisted the words of the President's letter into something more menacing. The last message may have been spoken rather than written, but it was the clearest of all. Perry explained that if it came to war, the Americans would win, and to rub this in he presented the Japanese with a pair of white flags. When asked what they were for, Perry explained that when the Japanese were ready to surrender they should hoist the flags. The Americans would then stop firing. Perry announced that he would leave the Japanese to think things over, and he would be back in a few months to sign a treaty.

Perry made one further sortie up the bay, to within sight of Edo castle, and then scuttled off to Shanghai, to refit and refuel his ships, which after their extended voyage were in desperate need of maintenance. When he returned to Uraga

Bay in the spring of 1854, he had an enlarged squadron of ten ships including the mighty *Powhatan*, the biggest and newest American warship. Perry pretended to the Japanese that this was still an insignificant fraction of the force he could call upon. In fact it was the biggest force the Americans had ever sent abroad.

In the meantime events had moved on in Japan. The old Shogun had died, and unfortunately his heir was quite literally an idiot. Abe was left to baby-sit and try to wring some kind of agreement out of the Shogun's council. Abe thought the best course of action was to play for time, to compromise but not give too much away, while learning from the West, importing Western technology and building up Japan's defences. In an attempt to build a consensus Abe circulated a questionnaire to all the local lords and even to the Emperor, asking for advice. This backfired, since they took it as a sign of weakness and declared that there must be no compromise: the foreigners must be driven off and Japanese society preserved without change.

Abe instructed his negotiators not to give too much away, but to agree some sort of treaty with Perry. Abe also managed to keep a lid on the volunteers who were lining up to storm the American ships. Perry narrowly avoided death when a lone samurai assassin changed his mind at the last minute. Perry, oblivious to his near-death experience and itching for an excuse to shell Edo, tried to goad the Japanese into an attack, but they held back.

The turning point in the negotiations came when Perry gave up on his demand for open trade, and settled for access to a couple of ports for coal and supplies, plus an American diplomatic presence at Edo. Perry's friends and relations in the China trade would have been much happier with open trade, but this was a start. This climb-down was just as well, because Abe had been quite willing to let the hot-heads attack the Americans if Perry had insisted on trade or tried to string out negotiations.

Abe must have thought that he could sell this compromise to the Japanese establishment. The treaty was signed on 31 March 1854, but Abe kept the terms secret from the local lords and the Emperor for another year. When they discovered the truth they were incandescent. The Emperor issued the first imperial decree in hundreds of years. He instructed the people to melt down temple bells to make guns and to expel the foreigners. Abe had done his best, but things were starting to unravel.

America's foot was in the door, but it took another man, the American consul to Edo, Townsend Harris, to barge it open. Playing on Japanese fears that the war then being waged by the British and French in China could easily be extended to Japan, Harris extracted Japanese agreement to open trade in the 1858 Treaty of Amity and Commerce. By then Abe was dead, and so was Perry. Japan began its descent into a decade of anarchy and civil war.

It is at this point that we need to switch our attention to China, and to under-

stand the true nature of the “China trade.” What was the Japanese establishment afraid of? To see what happened, we need to wind back the clock of history a few decades, to the start of the nineteenth century. Europeans and Americans were keen to buy tea, silk, cotton, porcelain and other art-objects from China. Tea was imported by Britain in vast quantities and had become the national drink, sweetened with sugar from Caribbean plantations. The problem for the merchants of the British East India Company and the American Russell and Company was how to pay for their Chinese imports. There was relatively little demand in China for Western goods, so the main thing being exported to China was silver bullion. Unfortunately, although tea was a self-renewing natural resource, silver bullion wasn’t. In modern terms we would say that the West had a “balance of payments problem.”

The merchants came up with an ingenious solution: export to China some self-renewing natural resource for which there *was* a demand in China. Opium. This was at the time illegal in China, but addicts need their drugs, legal or not. The merchants arranged to grow opium in India and smuggle it into China where middlemen and distributors sold it to addicts. Using the proceeds they then bought tea and other Chinese goods for export.

Imagine drug-cartels, organised and efficient, sponsored by the governments of Britain and America. Imagine giant opium factories, under the control of a quasi-state: the British East India Company. Imagine smugglers operating hand-in-hand with corrupt drug-enforcement officials. Imagine the Chinese government begging the British to close the cartels down and save millions of addicts from their fate. Imagine the British and American establishment counting their profits and salving their consciences with charitable donations at home. *This* was the “China trade,” and when Perry stopped in Shanghai to refit his vessels, he lived in a house on the “Bund” owned by Russell and Company, one of the world’s leading opium cartels.

However, not all the Chinese officials were corrupt. One official in Canton sparked the First Opium War in 1839 by seizing and destroying an opium shipment. The cartels protested at this infringement of their property rights. The Chinese authorities refused to pay compensation. The British said this was an affront to the principles of free trade, and declared that they would force the Chinese to see things the same way. British warships flattened China’s coastal forts, and British marines roamed at will, the Chinese powerless to stop them. The war ended in 1842 with the Treaty of Nanking, in which the Chinese ceded Hong Kong to the British, and opened five “Treaty Ports” to foreign ownership. In these “concessions” the Westerners could build their homes and warehouses, and most importantly enforce (or not enforce) their own laws. They were little pieces of Europe on the shores of China, sovereign territory run by the cartels.

Unable to stop the flow of drugs, the central Manchu government lost face and then steadily lost control of the country as aspects of its sovereignty were grabbed

by other organisations. Corruption blossomed, respect for authority declined, local bandits gained power. The government had clearly lost the all-important “mandate of heaven” — it was unable to maintain order, the prerequisite for government in China. In 1850, popular discontent coalesced into the “Taiping” rebellion, which over the next 15 years claimed an astonishing 20 million lives.

While the Chinese government was trying to suppress this rebellion, they simultaneously fell into another war with the Westerners, who insisted that the Chinese had not fulfilled their obligations under the Treaty of Nanking. Britain and France again defeated the Chinese, this time right outside the walls of Peking. The peace treaty in 1860 gave further Treaty Ports to the Westerners, plus the right to sail the length of the Yangtsee river and travel anywhere in China. Opium was finally legalised. The cartels had won.

The Manchu government discovered after all this that they quite liked the Westerners. The European customs officials were much more honest in collecting import duties than the former Chinese officials, so the central government actually had more revenue than before. There was of course still the problem of the Taiping rebels, with their capital in Nanking. The Westerners wanted to keep the privileges they had just won from the Manchu government, so they made common cause with their recent enemies and helped the Manchus to retake Nanking. Around 100,000 people were killed as the last gasp of revolution was crushed.

So this is what the Japanese establishment feared. They knew the price of submission, and the price of defiance. Neither option looked good. After the Harris trade treaty of 1858 there were two strands of opinion in the Japanese establishment. One said that it was best to play for time and learn from the West. In another science-fiction moment, the Shogun’s council sent a party of 77 samurai across the Pacific to San Francisco in a little ship bought from the Dutch. These novel sword-carrying aliens were feted across the country, like a diplomatic mission from the Klingon home-world. Their real purpose was to learn all they could about the United States, and particularly to learn about military technology.

The other strand of Japanese opinion said that the foreigners must be immediately expelled. The Emperor loudly supported this choice, perhaps out of frustration as the country descended further into chaos. The cry of gangs roaming the streets was “Revere the Emperor, Expel the Barbarians.” In truth there were few foreigners in Japan, but the body-count of foreign casualties slowly ticked upwards. In 1862, an Englishman called Charles Richardson failed to show sufficient deference to a Shimazu lord from Satsuma province in the south of Japan. The lord’s bodyguards killed Richardson at the side of the road.

The Shimazu lord didn’t care if he upset the Shogun’s relations with the foreigners. The Shimazu were centuries-old enemies of the Shoguns, and at this moment of crisis for the Shogun government they wanted nothing more than to twist the knife. The Shimazu were anti-foreign, but they were even more anti-

Shogun, as subsequent events demonstrated.

The British demanded an indemnity for the murder of Richardson and justice for his killers. The Shimazu lord ignored them. After huffing and puffing to no avail for two years, the British decided to settle the matter themselves by sending a squadron of warships. They bombarded the Satsuma capital, reducing much of it to ruins. The Shimazu lord was impressed. He paid the indemnity and punished Richardson's killers, but he also decided that this was technology that *he* needed. While nursing a resentment against the Shogun, who he blamed for all his troubles, the Shimazu lord started to build a Satsuma navy using imported technology.

A similar experience of defiance, bombardment and submission happened to the lord of neighbouring Choshu province, who also became a convert to the virtues of Western technology. Satsuma and Choshu armed themselves with foreign weapons and the civil war against the Shogun began in earnest. This civil war continued, on and off, until the death of the Emperor in 1867, an event celebrated across Japan with a bizarre epidemic of cross-dressing and drunken revelry.

When the new fifteen-year-old Emperor Meiji took the throne, the lords of Satsuma and Choshu declared a "restoration" of the Emperor's ancient authority and an end to the rule of the Shogun. The boy-Emperor was of course at that time just a pawn, a respectable "shill" for the Satsuma and Choshu rebels who had just manoeuvred themselves into control of Japan. After a few quickly suppressed revolts, the whole country united behind the new Emperor.

Now that the lords of Satsuma and Choshu were in power, they did the exact opposite of what they had been saying for so long. Rather than preserve the institutions of Japan and expel the foreigners, they ripped up the institutions and made nice to the foreigners. All the formal social classes were abolished, with their hereditary restrictions on what jobs people could do. The other local lords were stripped of their power. The administration of the country was completely re-organised, in much the same way that Napoleon re-organised the administration of France when he gained power after the revolution. Where previously there had been local autonomy, now there was a highly centralised state with far more sovereignty than any previous government of Japan.

The Satsuma and Choshu armies became the core of the Japanese army, their navy the core of the Japanese navy. A national school system was introduced to reinforce the traditional moral values of obedience to authority and absolute loyalty to the Emperor. (At this time, the most important moral value in Japan was certainly authority/respect, followed closely by sanctity/purity and ingroup/loyalty. The moral values of fairness/reciprocity and harm/care, shared across the whole political spectrum in the West, fell into a distant last place.)

Conscription was introduced for all twenty-one-year-old men. Like Communist regimes of the twentieth century, the government sent evangelists into the countryside to promote the new vision, with slogans like "Enrich the Nation,

Strengthen the Military.” In truth, the population of Japan saw very few riches, but the military and the industrial base to support it expanded in an incredibly short time to rival that of European states.

In 1889, the country adopted a constitution based on that of Germany. It had democracy and a parliament, but who was really in charge? By then the Emperor Meiji was in his mid-thirties and presumably a player, not just a shill. Since the coup two decades earlier, a new generation had been taught to revere him and obey him. But the former rebels from Satsuma and Choshu were still there too, still a real power, still running the administration, still in control of the army and navy. They needed the Emperor, but the Emperor also needed them. The close relationship between Emperor and military, excluding civilian government from decisions on war and peace, was not something new that happened in the twentieth century, it was there from the start.

Before we look at the story of the subsequent Japanese expansion, we need to take a detour to Okinawa, the largest island in the Ryukyus which stretch like a necklace from southern Japan down to Taiwan. The story of Okinawa is truly sad and bizarre, but it illuminates many of the following events. Although apparently a distant client state of China, paying a token tribute to the Manchus, in reality Okinawa had been secretly ruled for centuries by the Shimazu lords of Satsuma. The Shimazu maintained a small cadre of secret police and enforcers who formed the real government of the country. Everything else was sham. Apparently happy and peaceful, the islanders smiled and received visitors with trademark courtesy before politely but firmly ushering them on their way. Visitors were surprised to find that the Okinawans were so peaceful that they had no weapons of any kind, not even daggers.

In reality the island was a kind of prison camp, and the islanders little better than hostages or slaves — but slaves forced to keep their slavery secret. They had no weapons because their jailers didn't allow them weapons. Although the island culture had always been hospitable, now the hospitality had a darker edge. The islanders didn't want to risk further oppression if the truth was discovered. And the reason for all of this secrecy was that while Japan was “closed,” it wasn't completely closed: there was still trade between China and Okinawa and between Okinawa and Japan. But all the profits from this trade went to the real middle-men, the Shimazu lords of Satsuma (minus a kick-back to the Shogun who knew the secret but let the trade continue in return for a cut of the business).

In 1878 this secret oppression by the lords of Satsuma ended when Japan officially annexed Okinawa. For the Okinawans, the oppression now became worse, as the Japanese set about energetically erasing Okinawan culture and traditions. Remember the history of Okinawa as you think about Japan's subsequent expansion. The later episodes were not really new; they just happened in a different place.

The steam pressure had been building up inside Japan for years, but the pistons of military strength only really started to move in 1894, when Japan finally launched her first substantial war. Following a Japanese-sponsored attack on a Korean religious sect and subsequent reprisals against Japanese citizens living in Korea, Japan sent soldiers to “protect” its citizens. (A classic political attack.)

Now, Korea had for centuries been a client state of China, independent but under the protection of the Manchus, so this was tantamount to invasion. China decided to also send troops to Korea. However, the 1,500 Chinese soldiers aboard the S.S. Kowshing, chartered from Britain, were all killed when a Japanese squadron ambushed the ship en-route.

Since the Second Opium War, the Manchus had lost further client states and Treaty Ports to the Westerners, but this insult from the “dwarf bandits” of Japan was too much. The Chinese declared war on Japan, but were then crushingly defeated by Japan’s shiny new military machine. In September 1894, the Japanese destroyed half the Chinese navy in one afternoon. The Japanese captured Port Arthur in Manchuria and Weihaiwei in Shantung. China sued for peace.

The Japanese forced the Chinese to give “independence” to Korea, and when Korea’s Queen Min objected, they sent a group of sword-wielding assassins and killed her. China also gave Japan the large island of Formosa (now Taiwan), the Liaotung peninsula and a substantial cash indemnity.

Surprised by these developments, the European powers and Russia made the Japanese give the Liaotung peninsula back to the Chinese, but took Port Arthur and Weihaiwei for themselves. The Europeans then quarrelled with each other about who would get the biggest share of the loans that China was forced to take out to pay the Japanese indemnity. The Japanese had just joined the club of exploiters.

To understand the next development in Japanese expansion, we need for a moment to step back around the curve of the earth and see things from Britain’s point of view. In the closing years of the nineteenth century, Britain although “ruler of the waves” was nervous. “Perfidious Albion,” always holding back from permanent alliances, choosing to place her fingers now on one side of the balance of power, now on the other, looked around and noticed that she stood alone, without a friend. Observing Russian deployments in the Orient, Lord Salisbury said, “I don’t think we carry enough guns to fight them and the French together.”

The British figured that they needed some friends, or at least fewer enemies, and they started by appeasing the United States. Despite British fantasies of a “special relationship,” the American establishment had never particularly liked Britain, and at times during the nineteenth century things had been quite unpleasant. But in 1898 the British applauded approvingly from the sidelines as the United States sent six battleships into Manila harbour before breakfast one morning and sank the Spanish fleet at their moorings. The Spanish gave up the Philippines, Cuba

and Puerto Rico which became American colonies. Britain then ceded the right to build a canal across Panama, withdrew her fleet from the Caribbean, settled various boundary disputes and generally made sweet noises in America's ear.

With one problem solved, Britain turned to the Orient, and fell into the open arms of Japan. In 1900, a combined force of American, British, French, German and Japanese troops marched on Peking during the "Boxer Rebellion," and rescued their diplomatic legations from a 55 day siege. They found the Chinese guilty of crimes "against civilisation" and extracted further concessions, including a huge indemnity with China's customs revenue as security. But while this excitement was happening, the Russians quietly slid a 200,000 man army into Mongolia and a squadron of their Baltic fleet into Port Arthur.

So, in January 1902, Britain and Japan signed a naval treaty. Each promised that they would remain neutral if the other were involved in a war with one other country, but that if their ally was in a war with two countries, then they would come to their aid. Confident that the French would not now come to the aid of the Russians, in 1904 the Japanese launched a surprise attack on the Russian warships operating out of Port Arthur. The Russian Tsar decided to teach the upstart Japanese a lesson, and dispatched the whole Baltic fleet to get revenge.

The Russian fleet's journey was rather longer than it might have been because the British refused to let them use the Suez Canal, so they had to sail all the way down the Atlantic, around Africa and across the Indian Ocean. When the exhausted fleet finally arrived in the Orient, they were immediately attacked by the Japanese in the Tshushima Strait between Korea and Japan. The Russians lost all their battleships and most of their cruisers. Only one small cruiser and two destroyers made it to Vladivostok. The Japanese lost only two torpedo boats. Russia sued for peace, and gave the Japanese half of Sakhalin Island and their lease on southern Manchuria, including the South Manchurian Railway — later to be the scene of the Mukden Incident. Britain was rather pleased with its choice of ally and in 1905 elevated their naval treaty into a full alliance.

With Manchuria secured, the stage was now set for the Japanese to systematically plunder Korea. The Japanese first declared that Korea was a "colony." Large numbers of Japanese entered the country, and created a new police force which worked hand in hand with secret police and organised criminals to crush Korean resistance. Then in 1910 Japan declared that Korea was now not even a colony, but fully part of Japanese territory. The oppression stepped up a gear and Korea was stripped bare of everything valuable, from rice to ancient porcelain. But the Japanese aimed at more than this. They didn't only want to remove everything physical of value from the Korean peninsula, they wanted to remove the Korean people themselves.

In the words of Korean historian Yi Kilbeck, "Japan's aim was to eradicate consciousness of Korean national identity, roots and all, and thus to obliterate the

very existence of the Korean people from the face of the earth.” Korean school-children were taught in Japanese by school teachers carrying swords. Nothing was allowed to be printed in Korean. People were supposed to speak only Japanese, even at home. Resistance was intense, but ruthlessly suppressed. Over the following decades, millions of Koreans were forced into slave labour. Korea had been turned into a giant concentration camp. The West made no objection.

Meanwhile, back in China, the Manchu government was in 1910 finally close to collapse. Anti-Manchu secret societies, like Sun Yat-sen’s “Revive China Society” grew up in the 1890s, particularly after China’s first defeat by Japan. Reform by the central government was slow and grudging. It didn’t want to share what little sovereignty it had left. In 1898 the Chinese Emperor started a programme of reform, but he was quickly deposed in a coup led the Empress Dowager. Popular frustration condensed in 1900 into the Boxer rebellion. A violent protest movement rather than an organised revolution, the Boxer rebellion murdered around 200 Christian missionaries and 20,000 Chinese converts before converging on Peking. Their arrival prompted the Manchus to rather unwisely declare war on the Western powers and lay siege to the Western legations in Peking. You already know how *that* ended.

Not quite alive, not quite dead, the Manchu government stumbled on. By supporting the Boxer rebellion they had shown how *not* to resist the foreigners. Chinese modernisers like Sun Yat-sen, just like the Japanese decades earlier, wanted to learn from the West so that they could retake China for the Chinese, but as a first step they wanted to throw out the useless Manchus. In 1905, seeing the writing on the wall, the central government offered to produce a constitution within five years followed by elections, but these proposals were overtaken by events.

Sun Yat-sen had fled China to escape the retribution of the Manchus after a coup attempt in the 1890s. Since then he had travelled around the world raising money for the cause, and from Japan and Hanoi had continued to work against the Chinese government, organising insurrection after insurrection, in the hope that one might eventually reach a tipping-point and trigger a general rebellion. In 1910, Sun’s organisation attempted several coups while he was on a fund-raising tour of Europe and America. All of these symbolic attacks on the Manchus were put down, but each brought more and more recruits to the cause. Perhaps the fight could be won.

Finally on 10 October 1911 one of these insurrections in Wuhan was joined by a mutiny of the garrison, and events snowballed. Within a month, nine provinces had rebelled against the central government. The Manchus sent their general Yuan Shih-kai to sort things out. He recaptured the original scene of the rebellion, but by then the rebels had moved their base to the Treaty Port of Shanghai. Half of China’s industry was at Shanghai, and half China’s trade passed through its port. The local powers threw in their lot with the rebels, and the situation was now

more evenly balanced.

Although the rebels considered Sun Yat-sen to be their leader, they didn't actually have a clear leader on the ground — Sun was hurrying back but still not in the country. So the rebels made an offer to Yuan Shih-kai: join us, with your soldiers, and you can be President of the Republic of China. The Manchu Dowager Empress made a counter offer: stay with us and you can be Prime Minister of a constitutional monarchy. Yuan pondered these competing bids for his services, and decided to stay with the Manchus.

The Western powers held back from intervening in the conflict. After the Manchus supported the Boxer rebellion, the West had little love for the old regime. Perhaps the new Republic would be more cooperative. The country disintegrated into a fractal pattern of conflict: at the largest scale, the rebel army fought its way up-river to Nanking; in the middle, local oligarchs and warlords consolidated their feudal power; at the smallest scale, bandits stole livestock and settled old scores.

In Peking, the Manchus left town and headed back to Manchuria, from whence their ancestors originally came. Sun Yat-sen finally arrived in China on 25 December 1911, and in recently conquered Nanking he was elected President of the Republic. Six weeks later, the Manchus formally abdicated, and left the north of China in the control of Yuan Shih-kai. He waited. After a few weeks, Sun and Yuan made a deal to unite the country: on 12 March 1912, Sun retired and Yuan Shih-kai became President of a Chinese republican government with its capital in Peking. In reality, the boiling froth of warlords, bandits and private armies would not subside for decades. For now, Yuan Shih-kai was merely the strongest strongman in China.

At this point an unexpected turn of events presented Japan with an opportunity. Since Japan was an ally of Britain, when the First World War broke out in Europe, it was natural that Japan would help Britain by seizing German territory in the Orient. But the Japanese wanted to keep their gains, however things turned out in Europe, and they hedged their bets. They convinced Yuan Shih-kai to agree that the Japanese could keep all the German concessions, and in return the Japanese supported his ambition to become next Emperor of China. The Japanese didn't mind who appeared to be in charge, so long as they were the power behind the throne. (Unfortunately for them and Yuan, when he tried to declare himself Emperor, several provinces seceded and he had to cancel the decree. Yuan died a few months later.)

Hedging their bets still further, the Japanese played on the fear that they might yet change sides. They extracted secret agreements from their allies in Europe and America, saying that when it came to peace negotiations, they would certainly keep their German winnings after the war. And so, when the deals were done at Versailles in 1919, the Japanese did rather nicely out of the First World War.

But not everything went well for the Japanese. The biggest upset, for them

and their ally Britain, came at the Washington Naval Conference in 1922 when the Americans forced them to abandon their 20 year-old alliance. The Anglo-Japanese treaty, which guaranteed mutual support in case of war, was replaced by the Four-Power treaty, in which America, Britain, France and Japan agreed to settle their disputes by diplomacy. It guaranteed nothing. Britain gave up the fleet she needed to defend her empire and agreed to a much smaller fleet, equal in size to America, with Japan at a second-class 60% of the size. The deal was later described by historian Correlli Barnett as “one of the major catastrophes of British history.” It wasn’t much better for the Japanese.

In part Britain made this choice because the British establishment was in love with America and believed that they had a “special relationship.” In part it was a horror of war and a sincere belief in negotiation through the League of Nations. But mostly, it was money. Half the British tax revenue was being used to pay interest on war loans to the Americans. If the British made a fuss, the Yankees might foreclose on the British Empire. Trying to make the best of a bad deal, in 1924 the British Chancellor said that “Japan is at the other end of the world. She cannot menace our vital security in any way.” It’s interesting to speculate on how the twentieth century might have unfolded if Britain had continued to be allied with Japan. Not only the story of Britain but also the interlaced stories of Japan, China and the USA would have turned out very differently.

Back in China, towards the end of the First World War, Sun Yat-sen had returned to Canton after the death of Yuan Shih-kai. Without Yuan, the official government in the north had no more power than any other provincial warlord, and was in any case merely a puppet of the Japanese. Sun managed to blow life back into the embers of the republican “Kuomintang,” and established a rival government in the south. Looking at what had happened, and what might still happen, Sun Yat-sen saw that without its own military strength, the Kuomintang would always be at the mercy of shifting alliances between rival warlords. So with Communist Russian help, he opened a military academy at Whampoa, decorated with revolutionary artwork and inspirational slogans, to train a Kuomintang army.

Head of this academy was Chiang Kai-shek: on-and-off participant in Sun’s turn-of-the century uprisings, recent visitor to Moscow and graduate of both the Imperial Chinese and Japanese military academies. (Chiang also had impeccable connections in the Shanghai underworld.) One way or another, Chiang would be a central figure in Chinese politics for the next fifty years. American general Joseph Stillwell later said that Chiang was “The most astute politician of the twentieth century. He must be or he wouldn’t be alive.”

The intricacies of Chinese political manoeuvring and military operations at this time are frustratingly fractal in nature: every part, no matter how small, seems to have the same complexity as the whole. Sun Yat-sen died in 1925, and became an iconic figure whose portrait was displayed everywhere, as if to signify a unity

which no longer existed. The tension between the left-wing and right-wing of the Kuomintang had already been present in the military academy of Whampoa, but after Sun's death this tension grew into open hostility and warfare, even as the Kuomintang steadily gained control of China. Chiang Kai-shek rose from head of the Kuomintang army to leader of the Nationalist Kuomintang government of China in Peking.

However, Chiang never had control of the whole country. The boiling fractal froth of warlords, bandits and private armies was still there, only now with Chiang floating on top. He was a gifted politician, as able as anyone to cope with their rebellions and challenges, but Chiang also faced a deeper problem: the Communists. Originally the left-wing of his own Kuomintang party, but now a separate movement of their own, the Communists were dangerous because they were playing an entirely different infinite game from Chiang and the warlords. They didn't seem to be motivated by profit or power — they claimed to be looking out for the interests of ordinary people, and unsurprisingly this made them enormously popular with ordinary people. These revolutionaries threatened to undermine the whole system of power in which Chiang precariously balanced. So, like other Chinese rulers before him, Chiang concentrated his main energy on destroying the revolutionaries, and continued to do so even while foreign armies roamed China.

And so we come around to the next step in Japanese expansion: the 1931 Mukden incident and the subsequent take-over of Manchuria. This is the place in the story where most Western accounts *start*, looking to explain how things went wrong, not really noticing that the fabric of history appears much the same on both sides. This wasn't a change of direction for the Japanese, it *was* the direction.

The Japanese had a lease on parts of Manchuria since their war with Russia in 1905, but they didn't have sovereignty. They were just a tenant. Then in 1931, Chiang Kai-shek refused to renew the lease. The Japanese refused to leave, and tempers rose in local disputes.

The Japanese had tried in 1928 to provoke the Chinese by assassinating warlord Chang Tso-lin, but that plot fizzled out. This time, rather than rely on retaliation which might not come, the Japanese switched to a false-flag strategy and faked-up a Chinese bomb near the railway line at Mukden. Japanese troops fanned out across Manchuria, and Chiang Kai-shek ordered Chinese troops to fall back. The Chinese had many more troops, but they were poorly trained and widely scattered, no match for the disciplined, concentrated Japanese. Chiang used the age-old Chinese strategy of falling back before invaders while he continued his campaign to defeat his internal enemies, the Communists.

The Japanese declared that Manchuria was now the "independent" nation of Manchukuo, and to dress this up with an air of plausibility, they installed as emperor the naive and vain Pu Yi, formerly last Manchu emperor of China, 'rescued'

by the Japanese from the clutches of the 'evil warlords' of Peking. In return for the title of emperor, Pu Yi handed over imperial treasures he had taken from Peking and signed whatever laws the Japanese wanted, regardless of the cost to his Chinese subjects.

Now under the control of the Japanese army, Manchukuo was intended to become a new centrally-planned Japanese colony. Over the next few years, dozens of new cities were laid out to receive colonists from Japan. But unlike Korea, where centuries of wealth were ready for plunder, Manchuria's wealth was mostly in natural resources which needed more work and investment to extract them. The occupying Japanese army was impatient for faster returns, and chose a different way to make money — they took over the mantle of opium supplier to China. Steadily ramping up production in Manchukuo, by 1937 they were producing 90% of the world supply of illicit opium and heroin, bringing in around 300 million dollars a year.

But by then, Western opinion had turned against the Japanese. While he had little alternative to withdrawing Chinese troops from Manchuria, Chiang Kai-shek could and did protest loudly to the League of Nations. He got support from American Secretary of State Henry Stimson, who was outraged by the Japanese move into Manchuria. American President Herbert Hoover was much more lukewarm, and was adamant in private that there would be no substantial action against Japan.

Nevertheless, Stimson conceived and promoted the "Stimson Doctrine," that the United States would refuse to recognise any political change made by force. This put the British in an awkward position. The British had never defended the territorial integrity of China in any meaningful way, and they didn't want to start now. But the whole of British foreign policy was now predicated on negotiation through the League of Nations. The British had such a small military and such an exposed position in China that they could do little to defend their south-China possessions, let alone coerce the Japanese. Playing for time, they sent a man to investigate and write a report.

When Victor Lytton arrived in China with his team of investigators, the Chinese people were making their own, mostly non-violent protest against the seizure of Manchuria, in the form of an anti-Japanese boycott. Now, you might imagine that the Japanese would try to keep things quiet while Lytton wrote his report, but instead they did the exact opposite. In Shanghai, the Japanese provided themselves with the usual pretext, in this case the death of a young man singing Japanese patriotic songs on a Shanghai street, beaten to death by an irate mob. In a vastly over-the-top retribution, the Japanese launched planes from a waiting aircraft carrier to bomb Chinese civilians, and poured thousands of marines into the city. Westerners watched from their enclaves of "extra-territoriality" as the Chinese parts of the city were flattened and more and more Japanese and Chinese troops joined the

fight. There were about 100,000 troops engaged on each side when they signed a ceasefire in May 1932. By then about 18,000 civilians had been killed and 240,000 homes destroyed.

Victor Lytton presented his report to the League of Nations later in 1932. The report attempted to appear even-handed and not to come down on the side of China, but it did say that Manchukuo was just a Japanese puppet state with no popular support, and that the Japanese operations in Manchuria could not be considered “self defence.” When the League of Nations voted in 1933 to return Manchuria to China, Japan walked out. No more Mr Nice Guy. The Japanese army immediately advanced further into China, occupying Jehol and Hopei. Chiang Kai-shek accepted this as a *fait accompli*, since he was at that time too preoccupied with his “Fourth Bandit Suppression Campaign” against the Communists.

Why were the Japanese behaving like this? In America, Henry Stimson confessed that he was “baffled and pessimistic.” When Franklin Delano Roosevelt won the Presidency in 1932, Stimson lost his job as Secretary of State. Roosevelt was a Democrat, Stimson a Republican. But in the depths of the Great Depression, Roosevelt found it hard to get establishment support for many of his policies. He was trying to reform America’s broken institutions, and the vested interests in the establishment were arrayed against him. So, when Stimson made some supportive speeches, Roosevelt invited him to lunch at the White House. Over a long lunch on 17 May 1934, Roosevelt told Stimson a quite extraordinary story. Roosevelt said that when he had been a student at Harvard in 1902, he had a Japanese friend, who had told him “an impressive tale of long-term ambitions.” This is what Stimson wrote in his diary afterwards:

“This young Japanese boy had told him of the making in 1889 of the one-hundred-year Japanese plan for the Japanese dynasty, which involved the following steps in the following order :

“1. An official war with China to show that they could fight and could beat China.

“2. The absorption of Korea.

“3. A defensive war against Russia.

“4. The taking of Manchuria.

“5. Taking of Jehol.

“6. The establishment of a virtual protectorate over northern China from the Wall to the Yangtze.

“7. Encircling movement in Mongolia and the establishment of the Japanese influence through instructors as far as Tibet, thus establishing

a precautionary threat against Russia on one side and India on the other.

“8. The acquisition of all the islands of the Pacific including Hawaii.

“9. Eventually the acquisition of Australia and New Zealand.

“10. Establishment of Japanese — (using a word indicating a rather fatherly control, which the President said he could not quite remember) over all of the yellow races, including the Malays. In this way the young man said they would have a definite point of threat against Europe.

“When young Roosevelt asked him what they were going to do to the United States, he said that the United States need not have any fear; that all they would do in the new hemisphere would be to establish outposts, one probably in Mexico and another perhaps in Peru ; otherwise they would leave us alone. But we must remember that they were a temperate zone people and they must have Australia and New Zealand to expand in. The President commented in how many particulars this plan revealed to him by the young Jap, who was a highclass member of the Samurai caste in Japan, had been confirmed by subsequent events — this having been told to Roosevelt several years before the Russo-Japanese War.”

This is a strange story, isn't it? What are we to make of it? First of all, I think we have to accept that Stimson wanted people to think that this is what Roosevelt believed. Why else would Stimson publish it in his autobiography in 1948? By then the Second World War was over, Roosevelt was dead, and Stimson presumably wanted to show that Roosevelt had been anti-Japanese even back then. Perhaps Stimson wanted to try set the record straight, since he had earned himself a reputation as a bit of a hawk, not because he wanted war, but because he was “a pacifist who loved peace so much he was always ready to fight for it.” (Stimson had been Secretary of War during World War I and Roosevelt brought him back as Secretary of War in 1940, even though they were on opposing political parties.)

Did Stimson believe the story himself? He had every reason to think that Roosevelt might have come across such a story in his youth. Roosevelt's family had deep connections with the Orient. Roosevelt's grandfather, Warren Delano, had made his first fortune as senior partner of Russell and Company in the 1840s. He returned to the USA immensely wealthy and settled into the highest echelons of American society. Over-leveraged in the crash of 1857, he nearly went bankrupt, but recouped his fortune by returning to the “China trade,” this time concentrating exclusively on opium.

Things went so well that Delano chartered a clipper, the *Surprise*, to bring his family out to join him in China. (This was the nineteenth century equivalent of

chartering a 747 for a family trip.) The story of the *Surprise* entered family legend — Roosevelt’s mother Sara entertained successive generations of offspring with the sea shanties she learned as a child on the four month voyage, and Roosevelt himself had a wooden model of the ship on the table behind his desk and two more pictures on the wall. Given this fondly remembered connection to the Orient and Roosevelt’s own place at the epicentre of the American establishment, it was entirely plausible that he might as a young man in the privileged cloisters of Harvard have been told that story about Japan.

But why would Stimson feel he had to make Roosevelt’s attitude clear? Surely his record would speak for itself? Unfortunately (and no-one understood this better than Stimson) that’s not the case. It’s almost impossible to find what Roosevelt really thought about *anything*. This is not an accident. Roosevelt committed almost nothing of significance to paper. He didn’t allow notes to be taken at Cabinet meetings. When his presidential library was being dedicated in June 1941, someone asked why he was in such good spirits. He replied, “I am thinking of all the historians who will come here thinking that they’ll find answers to their questions.” The historians found that the record had been swept bare.

Roosevelt was eventually revered by the vast bulk of the American population because he saved them from destitution during the Great Depression, but his self-confessed deception and deviousness attracted the bile of American politicians from Communists to Fascists. They called him “That Man,” or even “that megalomaniac cripple in the White House.” The wealthy regarded him as a “traitor to his class.” He seemed to have no principles, acting purely out of pragmatism. Writer H. L. Mencken said, “If he became convinced tomorrow that coming out for cannibalism would get him the votes he so sorely needs, he would begin fattening a missionary in the White House backyard come Wednesday.”

He was also willing to take risks that would give other politicians sleepless nights. Philosopher Isaiah Berlin said he was “one of the few statesmen in the twentieth or any other century who seemed to have no fear at all of the future.” And although he could be charming when he wanted, he could also be heartless. For example, historians David Bercuson and Holger Herwig relate the following exchange between Roosevelt and his wife Eleanor, from Christmas 1941:

Had he called Marguerite “Missy” LeHand at Warm Springs, she asked Franklin. Surely, his former social secretary, confidant and “surrogate wife,” to whom he had given half his estate in a new will just the month before, after she had suffered a stroke, was waiting for the sound of his voice wishing her a Merry Christmas. FDR replied, as cold as ice, that he had *not* phoned Missy and that he had no intention of doing so. Deeply hurt, Eleanor later tearfully confessed to her friend, Joseph Lash, that her husband “seemed to have no bond to people. Not even his children. Completely political person.”

Perhaps, like me, you are starting to get a bad feeling about Roosevelt. In 1941, Stimson muttered to himself in his diary that two-thirds of Roosevelt's troubles came from his "topsy-turvy, upside down system of poor administration." Roosevelt didn't really administer his government in the usual way, he worked through a swarm of informants, advisers and proxies, each told part of a story and sent off to do some part of Roosevelt's will. No one except Roosevelt had the whole story, and no one really knew what Roosevelt thought.

But everyone knew that Roosevelt could very quickly change his feelings about people, and perhaps this was because he never actually had feelings to start with, just strategies for winning and getting what he wanted. Perhaps H. L. Mencken was closer than he knew when he compared Roosevelt to Stalin, saying, "The smile of the sonofabitch in the White House and the smile of Holy Joe in Moscow have a great deal in common." We'll never really know, but perhaps Roosevelt was a 'successful psychopath.'

Where does that leave us as we try to make something of the story he told to Stimson over lunch that day in 1934? Roosevelt's subsequent actions and statements over the following years are certainly consistent with the story. But it could still be a lie, convincingly told by a 'successful psychopath' so he could get what he wanted. Or it could be the truth. It's hard to say.

Meanwhile, the Japanese were certainly playing out their part in the story perfectly. In 1934 the "Amau Doctrine" proclaimed that Japan was the "guardian of peace and order in East Asia," and that China had no right to "avail herself of the influence of any other country to resist Japan." These were not just empty words — the Japanese military-imperial complex continued its penetration of northern China, making local arrangements with the warlords and smuggling yet more opium into the country. Chiang Kai-shek passively fell back, because he was entirely focused on his "Fifth Bandit Suppression Campaign" against the Communists. With 700,000 Chinese troops and the help of German military advisers, he finally cornered the Communists and settled down to starve them out or massacre them. Unfortunately for Chiang, the remaining 90,000 Communists broke out of the siege, scattered to escape Chiang's aircraft, and over the next year walked 5,000 miles to set up base in distant Shensi province in the north. After the "Long March" Chiang never again came so close to destroying the Communists.

Back in America, in April 1935, Roosevelt invited anti-war activists Clarence Picket and Harry Fosdick to tea in the White House. The US Navy was planning its biggest ever naval exercise, with 160 ships and 450 aircraft, near the Aleutians and Midway Island. When they could get a word in edge-ways between Roosevelt's reminiscences, Picket and Fosdick tried to convince the President to call off the exercise. It was a long way from American shores and seemed likely to provoke Japan. Roosevelt responded with a version of the story he told to Stimson about Japan's long-term ambitions. The exercise went ahead. Japanese Admiral Kanji

Kato said it was like “drawing a sword before a neighbour’s house.”

The next dramatic step in Japanese expansion came in July 1937. This was intended by the emperor and his military advisers to be a limited 90-day campaign to seize control of the north of China, the way they had in Manchuria and Korea. The war started with the “Marco Polo Bridge incident” — Japanese troops garrisoned near the Marco Polo Bridge outside Peking claimed they had been attacked by nearby Chinese troops. The Japanese retaliated. This undeclared war swiftly escalated. The Japanese dive-bombed a Chinese university. This time, Chiang Kai-shek declared that China would not surrender further positions or cede territory, but the Japanese advanced nevertheless.

Chiang opened up a second front in August 1937, moving his best German-trained troops down to Shanghai. He hoped that a battle which threatened the “extra-territorial” international concessions in Shanghai might produce an incident involving foreigners or foreign property. Perhaps the British or Americans could be drawn into the fight. Over the next three months, around 250,000 people died as Chiang attempted to win the sympathy of world opinion. He succeeded — the picture of a crying baby sitting on the railway tracks in the ruins of Shanghai remains one of the classic war photos — but there was no foreign intervention. The remnants of the Chinese army finally withdrew in November to Nanking.

This was the first of several retreats up the Yangtze river. Again following the classic Chinese strategy of retreating before the invader, Chiang soon withdrew to Wuhan, then finally far inland, beyond the Three Gorges, to Chungking in Szechuan province. From here he continued to claim that he ruled China, while the Japanese had *de facto* control of the coastal heartland. But Chiang had achieved victory of a sort, because he never surrendered, never came to an agreement with the Japanese legitimising their conquest. A million Japanese soldiers were still pinned down in China, fighting a war that should have been won in three months, against an enemy who wouldn’t give up.

In the coastal heartland of China, the Japanese military-imperial complex settled into the familiar rhythm of rape, murder and pillage. By December 1937, Chiang’s government had gone, but the city of Nanking still held out against the invaders. Emperor Hirohito, Meiji’s grandson, appointed his uncle prince Asaka Yasuhiko to take charge of the assault and sack the city. Out of everything else, before and after, the “Rape of Nanking” still stands out as a breathtaking example of inhumanity. After the city was taken, its inhabitants were systematically tortured and murdered. In a few weeks, 300,000 people were killed. Between 20,000 and 80,000 women of all ages were raped. People were machine-gunned, bayoneted, doused with petrol and set on fire. Officers organised a beheading competition. Although the details were probably little different from the sack of a thousand cities throughout history, this time there were photos. (The Japanese took their souvenir snapshots to be developed at camera shops in Shanghai, and copies leaked

out to the world's press.)

While the Japanese army had its boot on China's neck, a highly organised team of imperial thieves went through the victim's pockets, repeating the patterns of Korea and Mongolia, but this time firmly under the control of the imperial household. In Mongolia, a distressing fraction of the spoils had been siphoned off by army commanders for their own personal benefit. This time the looting was carefully supervised by imperial officials under the direction of the emperor's brother prince Chichibu.

The same combination of secret police and organised crime that stripped Korea went to work on China. Civilised for thousands of years, China had tremendous wealth, almost all of it very carefully hidden. China had been looted before, but never this systematically. Around 6,000 tons of gold was taken from Nanking alone. Officials and the wealthy were killed, kidnapped, coerced into giving up their treasure. Over the following years, the looters came back again and again, to pick up what they missed on earlier sweeps. A special cadre of antiquarians combed through China's libraries and museums. Japanese *Yakusza* worked with the secret police, supplying Chinese gangsters with drugs in return for gold. The proceeds of all these operations were carefully checked by Chichibu and other members of the imperial household before being crated up and sent to underground vaults in Japan. As before, ordinary Japanese people saw no benefit from this treasure trove, didn't even realise it existed. The tyrants of the military-imperial complex fully lived up to the maxim "All for ourselves, and nothing for other people."

But their plans were about to run off the rails. From our own position, looking back on these distant intertwined stories, it is tempting to surrender to the "narrative fallacy" and imagine that events must have been sweeping along towards Pearl Harbor and an inevitable war between Japan and the United States. Let's try not to make that mistake. The Japanese didn't intend to fight the Americans, certainly not then. Although they had seized Pacific islands from the Germans twenty years before, their bases were inadequate for war against America — the islands had no oil storage, no dry-docks or repair facilities, no airfields or hangars. Although the Japanese had more aircraft carriers than the Americans, Japanese warships were designed for short range operation, and when away from base they relied heavily on tankers to refuel them at sea. The Japanese were equipped for exactly the wars they had been fighting, on the coasts of mainland Asia.

Did America intend to fight Japan? Although some people, like Stimson, felt strongly about Japanese aggression, the American people were too preoccupied with their own problems in the Great Depression, too wary of entanglement in foreign wars, to do anything except talk about trade sanctions and embargoes. And of course, from the perspective of the Atlantic, which many Americans shared, more dangerous events were unfolding in Europe.

Europe was re-arming, which was a mixed blessing to America. It was good

news for American businessmen and their employees, still staggering out of destitution. Orders came rolling in. The American establishment thought that on balance Hitler might be a good thing, might one day take care of their mutual arch-enemy the Communists. When businessman Thomas Watson of IBM was given a medal by Hitler, he was proud to wear its swastikas on his chest. But anti-war activists were fearful about German ambitions in Europe.

Unlike many Americans, Roosevelt was more concerned about the Pacific. In 1937 he told his adviser Sumner Welles that he was far more preoccupied with the threat of Japan than the threat of Germany. This was a threat that would be met first by the US Navy, in which Roosevelt took an intense and personal interest. In a 1938 story the *New York Times* said, "The Navy is being run from the White House these days." It was well known that the White House was stuffed to overflowing with nautical memorabilia, but this was not just show. Roosevelt was expert on issues of ship design and armament and he maintained tight control over the promotion of senior officers. While America did not intend to fight Japan, what about Roosevelt? Let's see how the story unfolds. This might just be the greatest scam of the twentieth century.

In Europe, the second half of Western civilisation's civil war opened with Germany's Nazis taking control of Austria in spring 1938, followed in the autumn by Czechoslovakia, after Britain and France agreed to stand back. In August 1939 the Nazis and Communist Russians signed a non-aggression pact which paved the way for their next conquest: Poland. The British and French warned the Nazis not to invade; the Nazis invaded anyway. In September 1939, Britain and France declared war on Germany, despite the fact that there was nothing they could do to prevent the fall of Poland. Europe entered a "phoney war," with the enemies dropping leaflets and the occasional bomb, without much real warfare happening. The feared gas attacks and mass casualties didn't happen. The war was, if anything, boring. Finally, in April 1940, the war turned hot when Britain and Germany both invaded neutral Norway.

Meanwhile, in the Pacific, Admiral James Richardson's fleet of American warships had just finished their spring exercises in Hawaii. Normally they would return to their bases in California, at San Diego, San Pedro and Long Beach, but this year he was instructed keep the fleet at Pearl Harbor in Hawaii. Richardson thought the move west was provocative, and disruptive, since it took the fleet away from its training and repair facilities, its dry-docks, and the families of the sailors.

Richardson complained, but his boss, Chief of Naval Operations Admiral Harold Stark, blew him off with a variety of half-baked reasons, and one or two reasons that almost made sense. Stark said, "You are there because of the deterrent effect which it is thought your presence may have on the Japs going into the East Indies. You would naturally ask — suppose the Japs do go into the East Indies? What are we going to do about it? My answer to that is, I don't know." But Stark

didn't have to know. Both Stark and Richardson were dancing to someone else's tune: Roosevelt's. Most irritating to Richardson was an order for him to issue a press release saying that he himself had asked to keep the fleet in Hawaii. He did as he was told, but he wasn't happy about it. Richardson needed to talk to the man calling the tune, so he asked for a meeting at the White House.

Back in Europe, the slow-motion war suddenly came to life in May when German paratroops captured the "impregnable" Eben Emmel fortress in Belgium. Twenty five years before, the Germans had cheated by invading France through neutral Belgium. Now, to everyone's surprise, they did the same thing again. A few weeks later in June, the Nazis captured Paris and the French surrendered. The British expected, and soon received, an aerial attack preparing the way for invasion. The British prime minister had arranged stocks of mustard gas, and was ready to spray it on the invasion beaches, though his generals warned that this might tend to alienate American sympathy and invite retaliation against the British population.

In the event, the gas wasn't necessary, since a symbolic attack on Berlin by a force of British bombers convinced the Nazis in September 1940 to switch from military to civilian targets. The British prime minister declared, "I personally believe that the spectacle of the fierce struggle and carnage in our Island will draw the United States into the war." But this was just window dressing.

In fact the thing most likely to draw the Americans into the war was money, just as it had two decades before. At the start of the war, when Britain totalled up her disposable assets, she had about 770 million pounds to spend (about 1.8 billion dollars), far less than in the previous war. The Americans had imagined that Britain was still rich, and on that basis they had by the autumn of 1940 accepted orders for 10 billion dollars of war materiel. These were the orders that were pulling America out of economic depression, but when the American establishment finally saw the British accounts, they were apoplectic — Britain was bankrupt. They were going to have to support Britain, one way or another, just to get their money back. (In 1941, the Americans made the best of the situation and forced the British to sell their remaining American assets at knock-down prices.) From this point on, although Britain appeared to be independent, and pretended to be independent, it was in reality just a client state of America.

So in September 1940, when it became clear that the British would not be immediately defeated, Roosevelt agreed to "lend" the British 50 obsolescent 20-year-old destroyers, which Britain desperately needed to protect her Atlantic convoys. In return Britain "lent" America eight bases around the Atlantic, on 99-year leases — American "concessions" in the British empire, like the British "concessions" in the Chinese empire 100 years before.

Roosevelt also managed get Congress to pass the first peace-time draft law in American history, though by the narrowest of margins: one vote. Now, young men could be called up and trained for the military, even though there was no

enemy yet. A poll showed that 88% of Americans agreed with isolationists Charles Lindberg and Henry Ford. They wanted to keep out of Europe's wars. Roosevelt told parents in a radio broadcast that "Your boys are not going to be sent into any foreign wars." But privately he said, "Of course we'll fight if we are attacked. If somebody attacks us, then it isn't a foreign war, is it?"

On Friday 4 October 1940, Roosevelt was talking on the phone about a newspaper article he had recently read — a Japanese spokesman had called for the United States to "demilitarize its bases at Wake, Midway and Pearl Harbor." For once, we get to hear Roosevelt's candid reaction, because he had recently had a voice-activated recorder installed in the Oval Office, and often forgot to turn it off. Roosevelt was angry: "God! That's the first time that any damn Jap has told us to get out of Hawaii. And that has me more worried than any other thing in the world."

Perhaps it was a coincidence of timing, but on the next Monday, Arthur McCollum, the Head of the Far East Desk in Naval Intelligence, delivered a five page memo detailing why and how to trick Japan and the American public into war. (This memo lay hidden for over 50 years until historian Robert Stinnett discovered it in 1995 in an archive of McCollum's papers. All other copies had been destroyed.) Here are the concluding paragraphs:

9. It is not believed that in the present state of political opinion the United States government is capable of declaring war against Japan without more ado; and it is barely possible that vigorous actions on our part might lead the Japanese to modify their attitude. Therefore, the following course of action is suggested:
 - A Make an arrangement with Britain for the use of British bases in the Pacific, particularly Singapore.
 - B Make an arrangement with Holland for the use of base facilities and acquisition of supplies in the Dutch East Indies.
 - C Give all possible aid to the Chinese Government of Chiang-Kai-Shek.
 - D Send a division of long range heavy cruisers to the Orient, Philippines or Singapore.
 - E Send two divisions of submarines to the Orient.
 - F Keep the main strength of the U.S. Fleet now in the Pacific in the vicinity of the Hawaiian Islands.
 - G Insist that the Dutch refuse to grant Japanese demands for undue economic concessions, particularly oil.

H Completely embargo all U.S. trade with Japan, in collaboration with a similar embargo imposed by the British Empire.

10. If by these means Japan could be led to commit an overt act of war, so much the better. At all events we must be fully prepared to accept the threat of war.

McCollum was intimately familiar with Japan — he was born in Nagasaki to American missionary parents, and spoke Japanese before he spoke English. He had joined the US Navy at age 18 and served as a naval attaché in Tokyo. (Bizarrely, while he was there he had a part-time job as dance instructor to the future Emperor Hirohito). No one understood better how to wind up the Japanese establishment, and no one was more aware of the dispositions of the Japanese military.

McCollum was a familiar figure to Roosevelt — since early 1940 he had been the source of the reports which Roosevelt received every few days, summarising Japanese communications intelligence. Mostly these reports were delivered via the President's naval aide, but when McCollum had something especially juicy he came to the White House and gave it to Roosevelt in person. (Roosevelt didn't keep any of these reports or any record of them, so when people later asked what the President knew, there was nothing to find in the White House.)

McCollum's memo was addressed to Walter Anderson and Dudley Knox — Roosevelt's key naval advisers. Anderson was Director of the Office of Naval Intelligence, and met with Roosevelt several times a week. Although there's no firm evidence, it's hard to believe that Anderson and Roosevelt didn't discuss McCollum's proposals, that they hadn't in fact asked him to make those proposals. They certainly acted together over the next few months to decisively put the proposals into effect.

The next day, Tuesday 8 October, Admiral Richardson met with Roosevelt again, to try convince him to move the fleet from Hawaii back to California. (He had tried before, in July, but to no effect.) Roosevelt was insistent that the fleet would stay at Pearl Harbor, and made it clear that he was willing to sacrifice a Navy ship if that was the price to provoke Japan into war. Roosevelt said that sooner or later the Japanese would commit an overt act against the United States, and the nation would be willing to enter the war. Richardson made it clear that he wouldn't stand to have his men used as bait to tempt the Japanese. A couple of weeks later a White House leak predicted that Richardson would soon be removed from his post. A few months later, in February 1941, the prediction came true.

We need to take a brief detour at this point to see what was in the communications intelligence reports that McCollum continued to feed to Roosevelt every few days. In 1940 the Office of Naval Intelligence had in its service one of the most amazing groups of hackers in the history of the world. A lot has been made of the impressive British triumphs against German crypto systems, but the Amer-

ican achievements were even more extraordinary. We don't know all the details, because whole libraries of key evidence are still secret, many decades later. The people involved mostly took their knowledge to the grave, under the threat of imprisonment and loss of their veteran's benefits if they talked.

Nevertheless, we do know quite a lot. The United States had a ring of radio listening stations around the Pacific. American operators at these stations were expert at teasing information out of Japanese transmissions. They used Radio Direction Finding — RDF — to find what direction each transmission came from. Triangulating on a map of the Pacific, they could plot bearings from several stations to get a fix on each transmitter. Different radios, transmitting their dot-dash signals, had different sounds, “radio fingerprints,” no two alike. The operators used their ears and oscilloscopes to pick out one from another. Even without decoding their messages, Naval Intelligence could track Japanese ships around the Pacific.

But the American crypto hackers had also had stunning success. Perhaps best known is the almost unbelievable attack by crypto über-hacker William Friedman on the machine crypto-system which the Americans called “Purple.” This was used only for the most secure Japanese diplomatic messages, and only the most important Japanese embassies had the machine. Starting in 1938, Friedman and his team of hackers reverse engineered the machine and by August 1940 had recreated it on paper, having only ever seen encrypted messages. The Americans built their own machines to Friedman's design and they worked — they could read Purple. (In a strange coincidence, when the Americans finally captured a Japanese Purple machine near the end of the war, they discovered that both machines used the same telephone exchange components.)

Lesser Japanese consulates, such as the one in Hawaii, did not have the Purple machine, so they had to use a second tier of codes, called the “J-series” by the Americans. The crypto hackers had been cracking these codes for a long time, and in spite of minor changes in 1941, they continued to read and translate them within one day of transmission. But often they didn't need to crack the code at all, because Naval Intelligence tracked the couriers who delivered new code books and, posing as customs agents, quickly photographed their pages and resealed the boxes. (For diplomatic messages requiring less security, the Japanese used another even weaker code — this was called “PA” by the Americans. Needless to say they could crack this code easily too.)

And then there were the Japanese naval codes. The diplomatic codes revealed Japanese intent, but the naval codes told in detail what the military was doing right now and where it was going next. The *shin* code used by merchant ships was obtained by “the direct method” — agents paid 40,000 dollars to a Japanese radio operator for copies of the code books. The other naval codes were cracked by a team in Washington led by America's other crypto über-hacker, Agnes Meyer Driscoll, known as “Madame X.” She and her team used IBM statistical machinery

to peel open the radio call-signs, ship movement reports and “5-Num” system of code-words. They circulated a manual on how to solve the 5-Num code, with several revisions in 1941, by which time their solution also included codes from 57 pages of the original Japanese code-book obtained by “the direct method.”

McCollum collated information from all these sources and passed it on to Roosevelt. It was in this way that Roosevelt found that the Japanese consul in San Francisco was congratulating himself on having evaded the American embargo on oil exports to Japan. Roosevelt had announced an embargo in July 1940, but refrained from enforcing it until the spring of 1941. If the Japanese were going to attack, they would need fuel. Around 80% of Japanese petroleum came from the United States, so the Japanese scurried to fill up while supplies were still available. Naval Intelligence tracked the Japanese tankers as they sailed from California back across the Pacific to the main naval storage depot at Tokuyama on Japan’s Inland Sea.

The Japanese had never before made serious preparations for war against America, but in the autumn of 1940, with vast armies still bogged down in China, they started to make contingency plans. Peace was preferable, but if worse came to worst, they must be ready for war. In November they appointed Isoroku Yamamoto to operational command of the Imperial Japanese Navy. He sketched out his strategy for a war against the United States and the Western powers in the Orient. Japan would need to seize their resource-rich colonies, particularly the Dutch East Indies with their oil-fields. Yamamoto’s war plan opened with a surprise air attack on Pearl Harbor.

In the new year, as predicted by the earlier leak in Washington, Roosevelt fired Admiral Richardson, who would not agree to use the Pacific fleet as bait. On 1 February 1941, Roosevelt appointed Admiral Husband Kimmel as Commander in Chief of the Pacific Fleet. He was a patsy, unaware of the drama that he had stepped into. Richardson promised Admiral Stark, Chief of Naval Operations in Washington, that he wouldn’t pass on his concerns to Kimmel. “I shall keep my lips sealed,” he said. He didn’t tell Kimmel why he had been replaced, just hinted at a disagreement with authorities in Washington.

A few days earlier in Tokyo, Yamamoto had started circulating his Pearl Harbor attack plans around trusted naval officers. However, there was a leak, and concerned whispers chased around the Tokyo diplomatic community. United States Ambassador William Grew was alarmed, and sent a dispatch to Washington:

My Peruvian colleague told a member of my staff that he had heard from many sources including a Japanese source that the Japanese military forces planned in the event of trouble with the United States, to attempt a surprise attack on Pearl Harbor using all of their military facilities. He added that although the project seemed fantastic the

fact that he had heard it from many sources prompted him to pass the information.

In the Office of Naval Intelligence, McCollum was directed to provide his analysis. McCollum knew his Japanese history, knew that surprise attacks were standard operating procedure, knew that goading the Japanese into such an attack was part of his *own* plan. Nevertheless, on the day Kimmel took up his new job, McCollum informed him that, "The Division of Naval Intelligence places no credence in these rumors."

Kimmel's fleet had within it a flotilla of nine battleships, and Roosevelt made a rather curious appointment: he promoted his close adviser, the Naval Intelligence chief Walter Anderson to the rank of Rear-Admiral and made him "Commander Battleships," in charge of this flotilla. It was not a popular appointment — a lot of people didn't like Anderson. Stark apologised to Kimmel: "The appointment was forced on us by the White House. Anderson is a good man to handle the battleships, but I do not commit myself one inch beyond that." Stark warned, "Don't promise Anderson a promotion. He's always looking ahead for a new job."

The difference between Kimmel and Anderson is further illustrated by their choice of quarters. Kimmel chose to live a short walk from his headquarters, in a house with a magnificent view of the harbour, including "Battleship Row." Anderson, Commander Battleships, chose to live out of sight a safe distance away, the other side of Diamond Head.

Anderson knew all about the cryptographic triumphs back in Washington, but he told his new commander nothing. Anderson did, however, take time to call on the local FBI office and reminded them not to investigate the espionage being run out of the Japanese consulate. (The FBI had first been warned off back in October, told to discontinue their investigation and leave the job to Naval Intelligence. Annoyingly independent-minded, the FBI special agents continued to snoop on the Japanese in their spare time.) Clearly Anderson was rather more than a loyal subordinate to Kimmel. He was something closer to Roosevelt's enforcer in Hawaii.

Kimmel sensed that he was out of the loop. He asked Stark to keep him informed of secret intelligence, but Stark made no commitments. Kimmel tried again, tried to establish that he would be informed "immediately of all important developments as they occur by the quickest means possible." He wasn't. After the war, Kimmel said, "I can't understand, may never understand, why I was deprived of the information available in Washington." Kimmel was the patsy.

Japan and Germany had signed an alliance the previous autumn, and in April 1941, Japan squared things away diplomatically by signing a neutrality pact with Russia. Then to the surprise of Japan and Stalin, but almost no one else, in June

the Nazis invaded Russia. This took the pressure off Britain to some extent, but things continued to deteriorate in the Orient.

Roosevelt had ordered a few provocative covert sorties by US warships, called “pop-up cruises.” In July, the Japanese made a formal protest when one of these “pop-up cruises” was spotted by the Japanese in the Bungo Strait, the entry point to Japan’s Inland Sea. The Japanese gave chase to two darkened cruisers, but lost contact when they disappeared behind a smoke-screen.

Then, just as set out in McCollum’s plan, Roosevelt induced the Dutch to reject all demands from the Japanese for more oil from the Dutch East Indies. The Dutch actually reduced the quantity available and insisted that the Japanese pick it up in their own tankers, which were in very short supply. Then Roosevelt imposed a genuine embargo on the Japanese, and seized all Japanese assets in the United States. In 1941, Japan was consuming 3.5 million tons of oil a year (2 million tons for the navy, 0.5 million tons for the army and 1 million tons for civilian use). They had stocks of 7 million tons — two years supply.

In the United States, contracts were let for construction of a huge new naval fleet built around 100 carriers. (In 1941 Japan had 10 carriers, America only 7.) This new fleet would be ready in 1943 — two years time. Unless they acted before then, the Japanese would be on their knees at just the time this vast armada was ready to sail.

And so in July, the Japanese ordered a world-wide recall of their merchant fleet, a first necessary preparation for large-scale naval warfare. Roosevelt learned of this in his regular reports from McCollum, and to slow the progress of Japanese ships departing from Atlantic ports, Roosevelt closed the Panama canal. The closure was disguised by blaming it on water leaks in the Panama transit locks.

The prospect of war was obvious to everyone. At the end of July 1941, the Honolulu *Advertiser* ran a feature story in its magazine section, with drawings illustrating what an air attack on Pearl Harbor might be like. The writers probably based their story on the naval exercise conducted by Admiral Ernest King in 1938, in which his carrier aircraft mounted a surprise attack from north, but it wasn’t really a new idea. Naval officers had been discussing the theory such an attack for twenty years.

Japanese reconnaissance in Hawaii also stepped up a gear in August. The Japanese “outside man” at the consulate had been scouting observation points around Pearl Harbor since he arrived in the spring. (He had been identified immediately on arrival by Naval Intelligence who put a tap on his phone line. The FBI agents were not supposed to be paying attention, but they also staked him out anyway.) The “outside man” was far from discreet — he travelled to his observation points in a flashy Packard automobile and used his expense account to fund a lifestyle of hard drinking and prostitutes.

In August, the “outside man” made his first bomb-plot of the harbour, speci-

fying where each ship was moored, and sent this to Tokyo using the J-series diplomatic code. Naval Intelligence, as always, intercepted and decoded it. The “outside man” was so pleased with his work that afterwards he went on a drinking binge and got picked up by the police. The FBI men told Washington about the suspicious activity, even though they weren’t supposed to be watching. But the “outside man” was allowed to continue with his mission, and sent several updates over the following months. Naval Intelligence in Washington knew exactly what was happening. No one told Kimmel.

In September, Japanese merchant vessels started to receive their movement orders from the Imperial Navy. Warships and aircraft were recalled from China. (In an attempt at communications secrecy, the recall orders were issued by courier, but many of the units acknowledged their orders by radio.) Naval Intelligence followed the units as they were marshaled into task forces and worked out their order-of-battle.

Not many people wanted war. Most Americans didn’t. Many Japanese didn’t either. Fumimaro Konoye, the Japanese Prime Minister, arranged an extremely secret meeting with Joseph Grew, the United States Ambassador. Peace was possible, everything could be sorted out, if Konoye could meet with Roosevelt, perhaps in Hawaii. Konoye had a ship ready to sail. When they reached an agreement he would radio a message to the Emperor and all the war preparations could go into reverse. Grew was excited and immediately sent a dispatch to Washington, backed up by numerous follow-up messages including a personal letter to Roosevelt.

In Washington, Roosevelt also appeared excited at the prospect of meeting Konoye. Roosevelt loved cutting through procedure, sorting things out personally in ad-hoc meetings. It was just his kind of thing. But then in an instant he changed his mind, agreed that this wasn’t the proper way, that negotiations should instead go through the State Department. The opportunity was lost. In mid-September, Konoye narrowly survived an assassination attempt. In mid-October he resigned, and the Emperor picked as his replacement General Hideki Tojo, a good man for a war.

Ambassador Grew in Tokyo had an informant in the Imperial palace, so in early November he was able to report to Washington on the decision of a conference with Emperor Hirohito. The Japanese wanted to negotiate a deal, but saw no alternative to war if the Americans didn’t drop their embargo. The plan was set: invasions in south-east Asia coupled with the “screening movement” of Yamamoto’s fleet striking Pearl Harbor. To make sure of his information, Grew sent his naval attaché on a “holiday” with his wife to the Inland Sea. On his return the attaché told Grew about the furious preparations he had observed on the Inland Sea and the military bases around its shore. Grew sent Washington a strongly worded warning.

In the White House, Roosevelt started to cover his tracks. Before 12 Novem-

ber, visits by his naval aide, bringing Naval Intelligence reports from McCollum, had been recorded by the White House usher in the visitors log. The aide continued to deliver the padlocked leather pouch marked "For the PRESIDENT," but now he came at breakfast while Roosevelt was still in his pyjamas, so the visits weren't recorded. But at Roosevelt's insistence, the pouch now contained not just condensed interpretations, but "raw intercepts" of Japanese communications.

Of course, Roosevelt was not the only recipient of these intelligence reports. A handful of other people in Washington were on the circulation list, including General George Marshall, head of the army. On 15 November, he met secretly with seven newspaper reporters in the Munitions Building in Washington. Swearing them to secrecy, he told them that he expected war "in the first ten days of December." How could he be sure? "We know what they know, and they don't know we know it," he said. There was no reason for Marshall to inform Admiral Kimmel, but it is very strange that Marshall neglected to pass on his predictions to General Short, the army commander in Hawaii.

As their Hawaii attack force began to assemble at Hitokappu Bay in the Kurrile Islands, Japanese diplomats in Washington tried one last time to negotiate a deal. Roosevelt's excuse for imposing the full embargo that summer had been the movement of Japanese troops into French Indochina. (The French Vichy government — which was recognised by the USA as legitimate — had initially agreed, but then the Japanese had moved in far more troops than they promised.) The Japanese offered to go back to the previous status quo: they would withdraw those troops and the United States would lift the embargo. Could a temporary "modus vivendi" be arranged? Roosevelt knew from the intercepted diplomatic messages that this was the Japanese final offer, that the alternative was war.

The American military liked the idea of a "cooling off period," a temporary peace in the Pacific. A few days earlier, General Marshall and Admiral Stark had advised that they were not ready for war with Japan, that this would take resources away from the Atlantic, that even further Japanese attacks on China, Thailand or Russia "would not justify intervention by the United States." It was true that America was not ready for war with Japan. But with his behind-the-scenes predictions of war, Marshall clearly expected war to come soon, ready or not.

In Hawaii, Admiral Kimmel was still out of the loop, but he was determined to be prepared. Maybe he had a premonition. Naval Exercise 191 had been scheduled for several months, but Kimmel made it more than just an exercise. On Wednesday 19 November, Thanksgiving eve, Kimmel convened an urgent conference of warship and air commanders by blinker light, to avoid radio transmissions which might be intercepted by the Japanese. All leave for the weekend was cancelled — Exercise 191 would start on Friday morning. All ships were warned that genuine hostile warships might be encountered at any moment, and a warning code was arranged to signal the presence of the enemy.

In the exercise, part of the fleet played an attacking carrier force approaching from the north. As explained by historian Robert Stinnett:

In a bizarre series of coincidences, Yamamoto and Kimmel selected the identical launch area — the Prokofiev Seamount, an extinct underwater volcano about 200 miles north of Oahu. Their timing and planning borders on mutual clairvoyance. Each used Kaena Point, a promontory on Oahu's north shore, as the benchmark, decided on Sunday for an early-morning launch time, and marked two Oahu targets: Pearl Harbor Naval Base and Kaneohe Naval Air Station on Oahu's windward side.

Kimmel's fleet chased around the sea north of Hawaii over the weekend, but didn't bump into the Japanese. They were still at their assembly area in Hitokappu Bay. Kimmel was exactly two weeks early. Then on Monday 24 November, Kimmel called off the exercise early when he received a message from Washington saying negotiations with Japan were very doubtful and "utmost secrecy necessary in order not to complicate an already tense situation or precipitate Japanese action." Kimmel took this as an injunction not to be provocative — exercises have often been used to disguise preparations for real attacks — and the fleet sailed back to Pearl Harbor.

But Kimmel didn't give up entirely. Later that Monday afternoon he approved a plan for a task force of 25 ships including the carrier USS Enterprise and battleship USS Arizona to search north of Hawaii for eight days starting on Thursday 27 November. (They would probably have found the Japanese attack force.) But before he could put the plan into effect, Washington issued a "Vacant Sea" directive, ordering all US and allied shipping out of the north Pacific. As later explained by Rear Admiral Richmond Turner, "We were prepared to divert traffic when we believed that war was imminent. We sent the traffic down via Torres Strait, so that the track of the Japanese task force would be clear of any traffic."

Yamamoto's fleet was on its way. The Japanese carriers, escorts, tankers and submarines had departed Hitokappu Bay about an hour before Kimmel received the "Vacant Sea" directive. As they were setting off they transmitted various movement reports and other coded messages. Naval Intelligence listening stations monitored these transmissions, plotted their positions using RDF, decoded many of the messages and put the resulting data into the intelligence pipeline leading via McCollum to Roosevelt.

Kimmel didn't have access to the intelligence available centrally in Washington, but he went in person to visit the crypto hackers at Naval Intelligence in Hawaii. They had intercepted and decoded many messages indicating that the various assembled Japanese task forces were on the move. So on Tuesday 25 November,

Kimmel sent a priority message to Washington with this information, but got no response.

At breakfast time on Wednesday 26 November, Stimson phoned Roosevelt to discuss these Japanese movements. Roosevelt angrily claimed that he hadn't seen that report (which seems unlikely), and said it changed the whole situation because it indicated bad faith on the part of the Japanese, who were still negotiating and hoping for a "modus vivendi," an interim peace agreement returning to the previous status quo. What did Roosevelt and Stimson really think? Probably that now, with the Japanese fleets on their way, all that was necessary to guarantee war was to make the Japanese negotiators an offer that they couldn't possibly accept.

That afternoon, Roosevelt's Secretary of State presented the Japanese with a ten point proposal, but it was quite unlike what had been discussed a few days earlier. Now it was more like an ultimatum — for example it insisted on Japan withdrawing from China and supporting Chiang Kai-shek's government. The Japanese were dumbfounded. Roosevelt's biographer, Jean Smith, says, "To this day there is no satisfactory explanation" for Roosevelt's apparent change of heart. Certainly, if you believe that Roosevelt was innocent, there's no satisfactory explanation. But if you believe that Roosevelt was the operator running the whole scam, it all fits together quite nicely.

Later that same day, Admiral Stark put paid to any possibility of Kimmel sending a task force north to scout for the Japanese. Stark ordered Kimmel to use his carriers to ferry army pursuit planes to Wake and Midway islands. And so, when the Japanese attack came, the carriers USS Enterprise and USS Lexington along with 17 of the fleet's newest escorts were still at sea. The impressive but obsolescent 25-year old battleships still moored in Pearl Harbor bore the brunt of the attack.

On Thursday 27 November, Kimmel finally got a kind of reply from Washington to his Tuesday warning: Rear Admiral Royal Ingersol, standing in for Admiral Stark who was off with 'flu, sent an official war warning to all Naval commands. The warning authorised "appropriate defensive deployment." But this was dangerously vague, and when Stark got back to the office on Friday 28 November he sent a revised version. Stark said, "If hostilities cannot be avoided the United States desires that Japan commit the first overt act." Stark told Kimmel to inform only minimum essential officers, and to not alarm the civil population or disclose intent. Stark emphasised that Kimmel was to "Undertake no offensive action until Japan has committed an overt act." The army commander on Hawaii was also placed in the same rather odd position of being told that an attack could be imminent, but to do nothing out of the ordinary.

In Washington, Roosevelt continued to cover his tracks. He suggested to a meeting of his cabinet on Friday 28 November that he should send a special telegram to Emperor Hirohito, to try pull back from the brink of war. The message

asked Hirohito to “Give thought in this definite emergency to a way of dispelling the dark clouds.” Would this make any difference? Certainly not if Roosevelt didn’t send it — which he didn’t for over a week, waiting until it was just too late. Stimson was rather more candid in his diary, debating with himself the question of “how to maneuver them into the position of firing the first shot without allowing too much danger to ourselves.”

Over the next few days Kimmel pressed his local Naval Intelligence staff to find out where the carriers were now, the carriers which had recently departed from Hitokappu Bay. They couldn’t tell him. To be charitable, we might excuse this as incompetence, but that doesn’t seem likely. Although the local listening station in Hawaii intercepted many Japanese radio transmissions, someone in Naval Intelligence chose not to pass on the RDF reports to Kimmel. (Even today, hundreds of pages of RDF logs still remain hidden in secret archives.)

The convenient fiction that the Japanese fleet was on “super radio silence” has been used over the decades to explain how a surprise attack was possible. But as an explanation it has the disadvantage of not being true. After a flurry of radio broadcasts on departure, transmissions from the fleet continued sporadically throughout their voyage. For example, following a typhoon which scattered the fleet over the horizon, on Sunday 30 November the carrier Akagi broadcast on 4.960MHz to the tankers so they could regroup. This was on such low power that normally it would have been undetectable more than 100 miles away, but unfortunately one of the largest solar storms of the century was in progress, turning the ionosphere into a gigantic radio mirror in the sky, bouncing the signals thousands of miles.

Over the next few days, the passenger liner SS Lurline, en route from San Francisco to Hawaii, also logged several Japanese transmissions with an RDF bearing to the north-west. Japanese ships were retransmitting messages sent from Tokyo. When the SS Lurline arrived in Hawaii, the radio operator presented an RDF transcript to Naval Intelligence. (There is no trace of that transcript, but when the SS Lurline next docked in San Francisco on 10 December, Naval Intelligence boarded the ship and confiscated the original radio log. It should still be in the naval archives, but it was removed some time in the 1970s by unknown naval personnel.)

It’s also relevant that Tokyo continued to transmit many messages *to* the fleet. Although that didn’t directly indicate where the fleet was, Naval Intelligence didn’t tell Kimmel a particularly pertinent fact: these transmissions were moving to higher and higher short-wave frequencies. Kimmel would have immediately understood what that meant — higher frequencies guaranteed better reception at longer distances. The fleet had been sailing for over a week and was getting further and further from Japan. Hmm. I wonder what their target could be . . .

In Tokyo, following a final conference with Emperor Hirohito on Monday 1

December, Admiral Yamamoto sent his own war warning to the whole Japanese fleet:

Climb Mount Nitaka, 1208 repeat 1208.

This was the prearranged signal for war to start on 8 December, Tokyo time. (Mount Nitaka was the highest mountain in the Japanese empire, and the phrase “climb Mount Nitaka” colloquially meant “undertake a great task.”) It’s not entirely clear whether the message was sent in code or in plain text — the archives are still sealed — but it was certainly intercepted by Naval Intelligence. The next day in the Philippines, Admiral Thomas Hart cleared all American warships out of Manila Bay and sent them south to the Dutch East Indies. Kimmel was still out of the loop.

On Wednesday 3 December, Japanese diplomatic posts in the United States were told to burn all their code books except for the lowest grade diplomatic code, which the Americans called “PA.” (An exception was made for the embassy in Washington which was instructed to also keep its “Purple” machine for now.) The American crypto hackers could read all the Japanese diplomatic codes, but PA was the easiest.

So, when on Saturday 6 December, the Japanese “outside man” at the Hawaii consulate was asked for a final anti-aircraft status report on Pearl Harbor, his reply should have been especially easy to decode. His message to Tokyo concluded with a final piece of helpful advice:

There are no barrage balloons up and there is an opportunity left for a surprise attack against these places.

Naval Intelligence in Hawaii intercepted all the messages from the consulate that week. From the message indicators, they could tell which were spy messages and which were routine business messages. They decided to decrypt only the routine business messages and they told Kimmel nothing about the spy messages.

The same Saturday afternoon in Washington, Naval Intelligence obtained 13 parts of a message sent from Tokyo to the Japanese embassy, encoded using Purple. With help from Army translators, they decrypted and translated the whole thing in one hour. It was the main text of a declaration of war, with two further parts expected later. Naval Intelligence arranged for distribution around Washington. Roosevelt’s naval aide was notified to expect delivery that evening.

Around 8pm or 9pm Roosevelt finally sent the message that he discussed with his cabinet over a week earlier, the one asking Emperor Hirohito to “Give thought in this definite emergency to a way of dispelling the dark clouds.” The message went to Ambassador Grew in Tokyo, but Grew would still be waiting for an audience when the bombs started to fall on Pearl Harbor.

Roosevelt's naval aide presented the Japanese declaration to the President at around 9:30pm. "This means war," said Roosevelt. Harry Hopkins, the President's close adviser, said it was too bad that we couldn't strike the first blow, to prevent being surprised. Roosevelt said, no, we can't do that — we are a democracy and a peaceful people. Roosevelt tried to call Admiral Stark, but he was at the theatre. They finally spoke at midnight. According to Stark, Roosevelt said that "affairs with Japan were in a very critical condition," but he didn't suggest that any action be taken.

Early in the morning of Sunday 7 December, the final two parts of the Japanese declaration came off the teleprinter at Naval Intelligence in Washington. Fed through the Purple machine, one part was in English, declaring that further negotiation was impossible. The other part was in Japanese, and when translated it said that all previous parts of the message should be delivered to the United States government at 1pm Washington time. (That would be 7:30am in Pearl Harbor, the time of the attack.)

McCollum took copies of the messages to Stark, who appears to have done nothing, even though several hours remained before the deadline. An officer from Naval Intelligence, not waiting for a car, ran the four blocks to the White House, and at 10am Roosevelt's naval aide handed him the messages in his bedroom. The President made no comment. "I had no sense that he was alarmed," said the aide.

Another officer tried to take the messages to General Marshall, who had not seen any of them yet and seemed that morning to be moving in slow motion. Marshall said he would come and see the messages, but he took 75 minutes for a 10 minute journey. Then he read them all from the start, very slowly, ignoring pleas to turn to the end and notice the deadline. Then he phoned Admiral Stark. Marshall said he was going to alert army commanders. Should he alert the navy too? Yes, that's a good idea, said Stark. Would you like to use my, more powerful, navy transmitters, asked Stark. No, that's okay, said Marshall. But Marshall's army transmitters could not make contact with Hawaii, so the warning was sent by commercial telegram. It didn't arrive in time to do any good.

In the White House, Roosevelt was playing host to the Chinese Ambassador. Roosevelt read aloud the message he had sent the previous evening to Emperor Hirohito. He was pleased with the sound of his words. He paused at one point and said, "That will be fine for the record." When the ambassador left, Roosevelt toyed with his stamp collection, sorting through the envelope of new stamps which the state department sent him each week.

At Pearl Harbor, the bombs began to fall. There were last-minute cock-ups which no one could have predicted, adding to the disaster. An army radar station should have given early warning, but it was the duty officer's first day on the job, and he couldn't believe anything dramatic would happen. What were the chances? The operators watching their oscilloscopes were alarmed by what they

saw, indicating a huge number of approaching planes, but the officer made light of it and sent them to have their breakfast. Over 3,500 people died. Four battleships were sunk and four damaged.

That evening Roosevelt met with his cabinet and recounted what had happened. He “could hardly bring himself to describe the devastation.” He seemed to have physical difficulty getting out the words and twice asked to “find out for Gods sake, why the ships were tied up in rows.”

Eleanor Roosevelt went ahead with their regular Sunday-evening supper — the White House staff had Sunday off, and every week she cooked sausage and scrambled eggs for two dozen guests on a hot plate in the upstairs dining room. The President usually made cocktails, but tonight he had more urgent matters to deal with. Afterwards, the White House usher asked one of the guests, radio newsman Edward Murrow, to stay behind for a private meeting with the President.

Also waiting to see Roosevelt was special-ops expert William “Wild Bill” Donovan, summoned to the White House from a Sunday afternoon football game in New York. They joined Roosevelt for a midnight chat over beer and sandwiches. Murrow never revealed what was said, though he said it was the biggest story of his life, and he agonised over whether to tell it or to forget it. Donovan later hinted at what was said. Roosevelt was not as surprised by the attack as the people around him, and the attack was not unwelcome. Roosevelt was most concerned to know whether his midnight guests thought the public would now back a declaration of war with Japan. Yes, they told him, yes they would. The next day Roosevelt asked Congress to declare war on Japan. It was almost unanimous, only one vote against.

Admiral Kimmel, the patsy, became the scapegoat for the whole disaster. He was rapidly relieved of his command and demoted, as was the Army commander on Hawaii. Admiral Stark, though less innocent, was another high-level fall-guy. According to Richardson, “The President said that he did not give a damn what happened to Stark so long as he was gotten out of Washington as soon as practical.” Stark was removed and then forced into retirement.

In south-east Asia, the Japanese won a series of surprisingly quick victories, and were initially welcomed as liberators, freeing Asian people from Western colonial oppression. None of the victories was more surprising than the capture of Singapore from the British — perhaps the most humiliating defeat in British military history. A large but mind-numbingly badly led British garrison surrendered to a smaller but determined and effectively led Japanese army. About 80,000 British troops surrendered in February 1942. Their subsequent experience as prisoners of war was extremely unpleasant.

The first real check to Japanese momentum came in July 1942 at the Battle of Midway. Admiral Yamamoto had set a clever trap to lure in and destroy the remainder of the American fleet. Unfortunately for him, the crypto hackers of

Naval Intelligence were still reading the Japanese naval codes. Rather than being lured in, the Americans themselves set an ambush and in a few critical minutes changed the course of the war by sinking all four of the waiting Japanese carriers.

The Western forces inched their way back across the Pacific in a series of naval engagements, air-raids and ghastly jungle battles. For ultimate Western success, it was vital that China remain in the war, that Chiang Kai-shek's government hold out and not make a separate peace with Japan. America loaned China hundreds of millions of dollars, and shipped vital war materiel into China. American General Joseph "Vinegar Joe" Stillwell became Chiang's Chief of Staff, and for a time, was officially in command of China's army. (In reality Chiang maintained control behind the scenes, and as always was more concerned to keep on top of domestic rivals than defeat the invaders.) The Japanese, skirting around Chiang's inland holdout, conquered almost all of Burma and made it to the gates of India, but no further.

One step behind the conquering Japanese armies came the usual ruthless and systematic looters. Support for the "liberators" rapidly vanished. Hoshino Haoki, an aide to Emperor Hirohito, said, "There are no restrictions on us. These were enemy possessions. We can take them, do anything we want." The thieves seized the contents of bank vaults and temples. Under threat of death or torture, they took gold, silver, jewels, anything valuable. They issued a "scrip" currency, and used this "monopoly money" to buy everything else at prices they named themselves. There was no sense that the Japanese were settling in as masters of a running concern. They were in a hurry, eager to strip out everything of value as quickly as possible.

The Japanese also took people. Millions were cast into slavery, used as labourers in mines and construction projects. (They were sometimes paid token wages, but only in worthless "scrip.") Women were taken to be sex slaves for the soldiers. Prisoners of war were treated with particular cruelty — their death rate in captivity was over 1 in 4. When they were transported by sea, POWs were packed into "hell ships," with death-rates similar to the notorious Middle Passage of the African slave-trade. These ships were supposed to be specially marked so as not to be accidentally torpedoed, but the Japanese didn't bother. However, the Japanese did use the white paint and giant green crosses reserved for hospital ships to protect the treasure-ships carrying their loot back to Japan.

When the war ended, it came more suddenly than expected. Roosevelt died in April 1945, leaving his Vice President, Harry Truman, to unravel the patchwork of personal arrangements by which Roosevelt ran things. Stimson took Truman to one side after his first cabinet meeting and told him about another secret project staffed by über-hackers: the "Manhattan" project to build an atomic bomb. It was the first Truman had heard of it.

Victory in the European war was by then inevitable, it was just a question of

time. Russian troops had advanced to within a few dozen miles of Berlin. But American troops grinding their way towards Japan had only reached as far as Okinawa, where they had to fight for every building, every hole. Civilian casualties were perhaps as high as 1 in 3, numbers boosted by mass suicides near the end. (Japanese soldiers encouraged the Okinawans to believe that they would be subjected to rape and murder by the Americans. There was nothing left to pillage — the island was a wasteland.) After the battle, the survivors were surprised to find that the Americans were in fact a lot nicer than they expected.

Plans had been drawn up for an invasion of the Japanese mainland from the south, called “Operation Olympic,” but there was no realistic chance of it going ahead, because intelligence from the crypto hackers and experience from Okinawa indicated that American losses would be catastrophic. At the other end of Japan, the Russians had promised to declare war on Japan no later than 8 August 1945 — three months after the end of the European war. They were ready to re-take Manchuria and Sakhalin Island then fight their way down towards Tokyo.

The alternative to invasion would have been simply to blockade and starve the Japanese out. The Americans had drawn up a plan for strategic bombing, targeting 56 railway yards and 13 bridges. Coupled with a naval blockade, the result would have been famine, because Japan needed the railways to bring rice to their population. This was the same threat that Admiral Perry had held over the Japanese in Edo 90 years before. By the spring of 1946, all food in south-west Honshu, home to half the Japanese population, would have been eaten. People would be forced to flee or starve to death where they were. There would be chaos, disease, civil war. Whatever else happened, the imperial establishment would certainly lose control of the country.

It didn't work out that way because a couple of days before the Russians were due to enter this war, Truman decided to drop an atomic bomb on Hiroshima. The Russians declared war on schedule. A few hours later, America dropped another atomic bomb, on Nagasaki. Emperor Hirohito decided to surrender.

The Japanese had floated surrender terms before, but always with conditions, and Roosevelt had insisted on unconditional surrender. This time the Japanese asked for only one condition, that they be allowed to keep their Emperor and the imperial institutions. Personally, I'm not convinced that Roosevelt would have agreed. Would Hirohito have surrendered without this condition? Maybe not, even if that meant more atomic bombs. But Roosevelt was dead and Truman wanted to end the war. The condition seemed harmless and there had been enough death.

And so on 2 September 1945, American and Japanese representatives met on an American battleship moored in Uruga Bay to sign a formal surrender document. Just in case the symbolism of the location was lost on the Japanese, General Douglas MacArthur had a special flag flown in from Annapolis, to be displayed

prominently behind the new conquerors. It was the original 31-star United States flag from Admiral Perry's flagship. In a sense, this was the ending that Perry had been looking for all along.

This is the place where the hundred-year story of Japanese humiliation, victory and defeat conventionally ends, the dawn of a new and better era ushered in by the conquering Westerners. In practical terms, General MacArthur became a new Shogun. America ruled Japan as a vassal state for the next six years, exercising sole control and shutting out her wartime allies. Japan granted the United States numerous "concessions" in which the Americans could station garrisons, as they continue to do even today. (In contrast, in the European war, the defeated Germany was ruled jointly by her conquerors. The border between the occupying armies of Western and Russian civilisations became the "Iron Curtain" of the cold war. But that's another story.)

We need to let the story of China run for another five years before it reaches a similarly solid conclusion. Chiang Kai-shek had survived the Japanese invasion and conspiring rival warlords, but even with vast American help he had put up only a weak fight against the Japanese. As always, he wanted to conserve his resources for the next war against his internal rivals, the Communists. By contrast, the Communists had fought enthusiastically against the Japanese, they were stronger and they enjoyed much more popular support. With the war against the Japanese over, Chiang's position gradually crumbled. The Americans didn't notice what was happening to their wartime client until it was too late. In December 1949 Chiang was chased out of mainland China to recently liberated Taiwan, where his government lived on under the protective wing of the Americans.

Maybe the best way to see the Communist victory is as a closing bracket matching the opening bracket of the Taiping Rebellion one hundred years earlier. Finally, the country was re-unified and the foreigners expelled. This victory looks like a satisfactory ending to a story of humiliation followed by defeat after defeat. Unfortunately the Chinese did not live happily ever after. Ten years later, the "Great Leap Forward" attempted to create a society without property or money, but actually created a famine that killed 40 million people, although this was hidden from the world for a long time. (The Communist party continues to rule China, but has transformed into something rather strange, neither communist nor a party, but rather a half-secret quasi-state controlling the state of China from within. But again, that's another story.)

Let's draw these intertwined stories properly to a close by reconsidering the questions I posed at the start of this chapter. To what extent can establishment elites really plan and control their future? How bad can things get when tyrants have control? Can we really recognise psychopaths in positions of power? And where is all the gold?

The story of Japanese expansion over the reign of Emperor Meiji, from 1868 to 1912, looks like an organised plan, a plan that worked. Only with central organisation and vigorous cheer-leading could the Japanese people be convinced to work very hard, for little personal gain, to equip one of the best military forces in the world. While the ordinary people sacrificed a great deal, the establishment elite and their leader, the Emperor, did very well for themselves.

Did the establishment elite get what they planned? The only way we could really answer that would be if we knew what they actually planned. Although Roosevelt's tale of Japanese long-term ambition still seems plausible, we have no way to tell whether or not he just made it up. And even if that was originally their plan, it would have to be changed to cope with unfolding events, such as the disintegration of China, the set-back of the Washington Naval Treaty, new technology like the aircraft carrier. In the end, the Japanese establishment was undone by the unexpected marvels worked by the crypto hackers of Naval Intelligence and the physics hackers of the Manhattan Project — technical developments that could not be predicted.

How bad can things get when tyrants have control? Clearly, really very bad indeed. The rule of the Japanese military-imperial establishment over their conquests was uniformly hellish. Their infinite game seems to have been based entirely around taking stuff away from other people by force. Some infinite games can co-exist, but an infinite game of theft is bound to upset other establishments in other states, and provoke some kind of reaction.

The evidence, though well hidden, seems to point at Roosevelt being the skillful operator who tricked an unwilling Japan into the Pacific war. The escalating sequence of American provocations led the Japanese to conclude that they had no alternative to war. The Japanese attack on Pearl Harbor was then followed by retribution when the American people united behind Roosevelt. Provocation, reprisal, retribution. A perfect “political attack,” the scam of the century — and, I think, in the final reckoning a Good Thing. Better by far than the despotic empire that the Japanese establishment would have imposed on Asia and the Pacific.

Can we recognise psychopaths in positions of power? It's easy to apply that label to people who cheerfully watch over murder, the way some of the Japanese did, but not necessarily correct. It might be more accurate to say that their sense of ingroup/loyalty was so strong, their contempt for outsiders so great, that they were unable to see non-Japanese as human beings.

Was Roosevelt really a ‘successful psychopath’? That would certainly explain the divergent views about him, why he presented very different impressions to different people, how he could turn his back on people in an instant. It would explain a lot. It would explain how a man who apparently did so much good could also take the huge gamble of provoking Japan into war while the United States was still quite unprepared. (The result was never as certain as it appears in

retrospect.) It would explain how he could let thousands of people go innocently to their deaths at Pearl Harbor. Psychopaths don't care about your feelings, don't really even understand them. They do things for selfishly unemotional reasons. They like to "win," and don't much mind who suffers. Afterwards when we look at what happened, we can sometimes find that they actually did some good, almost by accident.

And finally, where is all the gold? At the end of the war, the Americans discovered great hoards of gold, silver, precious stones and other treasures in Japan. And this was only counting what they found in ordinary warehouses and vaults — doubtless there was even more loot hidden in secret tunnels and mines. A few such hidden caches came to light in the Philippines — tunnels filled with gold ingots stacked in piles taller than a man. At the end, the Japanese had not been able to move their loot by sea, even in their fake hospital ships. So they hid the remaining plunder in dozens of tunnels dug in the Philippines using slave labour, presumably thinking they might come back one day and get it. Even if it took a hundred years, the treasure would still be there, patiently waiting for them.

The Americans were left in a quandary. The previous year, in a meeting at Bretton Woods in New Hampshire, they had imposed on their allies an agreement about the post-war financial structure of the world. The United States had 60% of the world's official gold reserves, and in future the dollar alone would be backed by gold, and other currencies would be defined in terms of the dollar. A new gold standard, at one remove. This arrangement gave the Americans a dominating influence over the finances of the world. But if the size of looted Japanese treasure was revealed, it would throw those financial arrangements into confusion and fatally weaken America's dominating position. To this day, there is no declassified record of the gold and other valuables found in Japan after its surrender. The archives are still closed.

In any case, how would this treasure ever be restored to its rightful owners? Many of them were now dead, or had previously been hiding their wealth from their local governments. Much of the gold had been melted down and re-cast, so it was untraceable. The American establishment decided that it was simpler and better not to tell, but instead to keep for itself the loot it had found, a vast slush-fund outside the control of the official United States government. The rest of the loot, maybe most of the loot, was left where it was, and they didn't pry any further.

So in 1951, the Americans produced a peace treaty with Japan, ending the occupation. The British had said to the Americans that, "We regard the payment of Japan's 'gold pot' reparation as one of the points on which it is essential for us to be firm." But Britain was now a client state of America, and under American pressure the British gave up their claim. Article 14 of the peace treaty said: "It is recognised that Japan should pay reparations to the Allied Powers for the damage and suffering caused by it during the war. Nevertheless it is also recognised that

the resources of Japan are not presently sufficient.” A convenient lie. The Americans also down-played the suffering of the POWs and slave labourers, and on their behalf renounced any future claims for compensation.

General MacArthur, the “Foreign Shogun” handed the country back to the Emperor, with a new constitution and a new parliament. Behind the scenes, the Japanese establishment was little changed, old sins quickly forgiven. In 1957, the wartime minister of munitions, Nobusuke Kishi, became prime minister. (For comparison, the Nazi German minister of munitions, Albert Speer, would remain in Spandau prison for another decade. Different standards applied to Japan.)

After that, what happened to the treasure? Where *is* all the gold? It is impossible to say with any confidence how much gold there really is in the world, and probably foolish to speculate. The official reserves must surely be only a fraction of the true total. Some of the American share of the loot was deposited in banks around the world and used to finance shady enterprises. Ferdinand Marcos, for a while dictator of the Philippines, recovered a significant quantity of gold, which he too deposited in Western banks. When he was overthrown and run out of the country, he was upset to discover that the banks refused to honour his goldsmith’s tickets. A considerable amount of treasure remains buried in the Philippines, but presumably the bulk is still hidden somewhere in Japan.

History and Prophecy

On the last day of the last year of the twentieth century, a small group of ageing hackers and former hippies gathered in San Francisco around a rather unusual clock. Taller than a person, it looked like the strange offspring of a romantic liaison between the Antikythera device and Charles Babbage's difference engine. While the world outside counted down the seconds to Y2K, the small audience waited in silence for the clock to do its thing . . . Click! Whirr. Bong! Silence. Then again: Bong!

The audience let out their breath. They could have set the clock and heard it strike twice like that whenever they wanted, but to hear it strike twice at the *proper* time was something else. This clock was the first prototype for the Long Now Foundation's ten thousand-year clock. It was designed to strike once to mark each new century, and twice — like today — to mark each new millennium.

Why ten thousand years? The history of what we might recognise as civilisation runs about ten thousand years into the past, and without any other clues to guide us, we might guess that we had wandered into the story about half-way through. A clock to tick through the rest of history would run for another ten thousand years.

What's the point? The point is to make people think about the long term future, and to take it seriously. When the clock next strikes the century, I confidently expect that I will be long in my grave, but human life will still go on. What will it be like by then? What will be the consequences of the choices that you made while you were alive? The point of the clock is to make you think.

Ten thousand years is one hundred centuries, and a century is a long time. Long enough to be born, grow old and die. Long enough for virgin forest to be cut down and transformed into farmland with roads, towns, theatres and laughter. Long enough for the same farmland to lapse back into forest, with buildings reduced to mere outlines on the ground, and only the sound of birdsong and mosquitoes.

On this longer timescale — the *longue durée* as historian Fernand Braudel called it — we can see patterns not visible at the pace of everyday life. The events of close-up history are mostly just ripples and froth on top of the slower, more powerful ebb and flow of the *longue durée*. On the scale of centuries we see the fortunes of nations rise and fall; we see societies transform and evolve. And on an even longer

scale, we see whole civilisations grow and collapse.

In this last chapter I want to show you three key patterns in the *longue durée*, factors that in the past have been precursors of collapse. Rather disturbingly, all three factors seem to be present in Western civilisation as I write. What are our prospects? How much danger are we really in, and what can we do about it? I will return and try to answer these questions later, but first let's look at the three factors: **external shock**, **elite mismanagement** and **production crisis**.

An **external shock** might be an invasion, a plague, a change in weather patterns or some other Act of God, fatally disrupting the normal operation of a society. Such disasters are almost always unpredictable, one-of-a-kind “black swan” events. Preparing for any particular disaster is a waste of effort, because it almost certainly won't happen. Some disasters are so huge that collapse is inevitable. But faced with smaller disasters, some societies will survive while others will collapse. What makes the difference?

The key is how brittle or robust those societies were before the disaster: how much “slack” did they have? Efficiency is all very well, but to be robust, systems need slack. Think of a hospital, faced with a local emergency. Would you rather be taken to the efficient hospital which can exactly cope with everyday demand? Or would you rather arrive at the inefficient hospital, the one which can treat you right now, because it has excess capacity?

In the good times, slack looks like avoidable expense — a waste of money. Managers are rewarded for cutting out slack. But in an emergency, slack is the difference between survival and collapse. Systems without slack are brittle and prone to sudden failure. Soldiers are well aware of this, and tend to have a queasy pit-of-the-stomach feeling when “all reserves are committed” — they understand that when there is no slack left, the do-or-die moment has arrived.

The second factor, **elite mismanagement**, is dismissed by some historians as too weak an explanation for past collapses. For example, Joseph Tainter says that “any rational dominant class, however oppressive, must make some provision for the welfare of the populace on which they rely.” If that is the case, explaining elite mismanagement boils down to explaining why “some elites behave rationally and some don't.” Tainter writes off the whole topic, saying that “until some theory is developed concerning the expression of elite rationality vs. collective suicide, we may confidently dismiss the elite mismanagement argument as unproductive.”

But we should not write off the topic, because we hold in our hands the theory that Tainter wanted. We have seen that social instruments tend to degenerate into institutions; we have seen that establishment elites tend to focus on their infinite games. These infinite games may be about wealth or *dignitas* or treasure or even who has the biggest monument. Some members of the establishment, the long-termers, understand that they *are* playing an infinite game. They understand that

in order to keep the game going, they need to make compromises and pursue victory less than wholeheartedly. They need to “leave money on the table.”

Others, the short-termers, never realised or perhaps forgot that this was an infinite game. Instead, they play a finite game and try to win at all costs. They try to preserve institutions which support their position in the game, even when reform is desperately needed, even at the cost of their society’s collapse. The establishment choice, between “rationality” and “collective suicide” is determined by the balance between long-termers and short-termers, between those who try to keep the infinite game going and those who treat it as a finite game and try only to win. So, as an explanation for collapse, elite mismanagement *is* useful and productive, despite Tainter’s reservations.

The third factor, **production crisis**, has been best analysed by John Greer, who is Grand Archdruid of the Ancient Order of Druids of America. (To be frank, some people find this title a little off-putting, assuming that it must indicate woolly thinking. Don’t worry. Greer’s thinking on this subject is as clear as anyone’s and his analysis subsumes the “resource exhaustion” and “complexity collapse” theories advanced by other authors.)

Greer’s explanation goes like this. In all societies with complexity greater than hunter-gatherers, we can classify almost all things into one of three categories: **resources**, **capital** and **waste**.

- “**Resources** are naturally occurring factors in the environment which can be exploited by a particular society, but which have not yet been extracted and incorporated into the society’s flows of energy and material.” For example, this includes coal and iron-ore still in the ground, fish in the sea, and land which is currently wild, but could be used for agriculture. It also includes human resources such as children who could one day work, but are too young right now. It also includes skills or discoveries which have not yet been made, but could be made with the available tools and techniques.
- “**Capital** consists of all factors from whatever source that have been incorporated into the society’s flows of energy and material but are capable of further use.” For example, this includes farm land, crops, tools, factories, buildings, ships and domestic animals. It also includes any productive human capital, for example, peasants, technicians, engineers and policemen. (Greer makes no distinction between “physical capital” and “labour.”) It also includes social capital, in the form of social instruments and intellectual capital in the form of knowledge and skills. (Note that money is *not* a form of capital, but as you would expect, just a technique that helps groups of people decide how best to use capital and resources.)

- “**Waste** consists of all factors that have been incorporated into the society’s flows of energy and material, and exploited to the point that they are incapable of further use.” For example, this includes waste heat from power-plants, broken or discarded tools, pollution, human workers at the end of their working lives and the information lost when a library burns down.

The relationship between these three categories is that capital is the mechanism which transforms resources into new capital and waste. Some waste is the unavoidable operational expense of using capital to produce new things. For example, the laws of thermodynamics mean that there must always be *some* waste heat from a power plant. Other waste appears because capital tends to wear out when it is used and to decay even when it is not used. Some waste appears because we enjoy producing it, for example a fireworks display.

Clearly this classification is a gross simplification of reality, but it serves to explain certain consequences which will almost always be true regardless of the details. In particular, because capital tends to self-destruct whether or not it is used for production, this means that in order to preserve today’s capital for the future, we must devote some part of production towards maintenance and replacement. This maintenance requirement means that even if the supply of resources is adequate, a society can still experience a **maintenance crisis** if it cannot meet the replacement needs of existing capital.

It’s easy to see that this is the case if capital is mismanaged. For example, a society might devote itself to producing mansions and fireworks rather than doing needed maintenance on roads and bridges. Eventually this transport infrastructure will start to fall apart, but by then the backlog of maintenance will be so great that it will be impossible to repair all the roads and bridges before more of them disintegrate, perhaps a great many more.

However, this maintenance limit must be reached at some point whether or not there is mismanagement. Software hackers have a rule of thumb that says creating software is only 30% of the effort — maintaining it over its lifetime accounts for the other 70%. So, it is easily possible for a hacker to create more software than they can maintain. The only alternative when that happens — and it happens every day — is to simply abandon some of the software.

You might feel that this may be true in the world of software, but in everyday life could we ever have too much stuff? The idea seems counter-intuitive, not to say contrary to the spirit of our age. But imagine if everyone had a large mansion, with dozens, maybe hundreds of rooms, set in a grand estate with lawns and trees. (Feel free to embellish this with a swimming pool, stables and maybe a golf course if you like.) Now, mansions need a lot of maintenance — dusting, cleaning, painting, repairing, gardening and so on. If *everyone* has a mansion there will be no-one with the time to do that work for *you* because they will all be busy working on their *own* mansions. To reduce the effort to something manageable, you would be

forced to live like an impoverished aristocrat, using only a few rooms in one wing of your mansion and leaving the rest to go to ruin — capital decaying into waste.

In a maintenance crisis, some forms of capital will necessarily be lost: buildings will decay; machinery will break and not be mended; skilled workers will retire or die and not be replaced; knowledge and technology will be lost. In extremis, the capacity to keep people alive and healthy may be reduced to such an extent that human capital is lost wholesale to famine and disease. However, provided that resources are still as readily available, or are depleted but self-renewing, then a maintenance crisis will be self-limiting. The society will tend to oscillate above and below the maintenance limit.

Unfortunately, if resources are consumed faster than their renewal rate then we run into a rather worse problem. As resources become more difficult to obtain, this can be compensated by applying more capital. Compare, for example, walking into the forest to gather firewood versus switching on a gas-fired heating system. For heating our houses, gas is easier and quicker, but it also relies on a vastly greater capital infrastructure. As resources become scarcer, even more capital must be applied to deliver the same outputs as before. Coal mines go deeper; oil production shifts from land to coastal waters then to the deep sea. But eventually there must be a limit to how much capital we can use to extract these scarce resources, if only the maintenance limit that we have already seen.

When no more capital can be devoted to extracting scarce resources, the result is not the self-limiting maintenance crisis described above, but rather a self-reinforcing **catabolic collapse**: part of the capital must decay to waste because it cannot be maintained, but this reduction in capital leads in turn to a reduced ability to extract scarce resources. Without those resources, part of the remaining capital must decay too, because it cannot be maintained. And so on, round and round again: less capital means less resources means even less capital. Eventually, with almost all of the former capital transformed to waste, only a small fraction of the previously available resources can still be extracted. Worse than that, most of the social and intellectual capital, which are the heart of a civilisation, are also transformed to waste. The civilisation has collapsed.

These three factors of external shock, elite mismanagement and production crisis are the symptoms or precursors to collapse. When we look at Western civilisation what do we see? What are our prospects? Where exactly should we look? Western civilisation has tendrils and concentrations across the whole globe. But there is one clear leader, dominant since the end of the Second World War, spared from the destruction in the old European heartland. That leader is, of course, the United States. Now, if we found precursors of collapse in other places, at the periphery or even in the old heartland, we could perhaps write them off as unimportant. But if we find them at the core, in the United States, that would be a disturbing sign. Unfortunately, we don't have to look very hard.

The United States is certainly in the grip of a **production crisis**. Signs of at least a maintenance crisis are very obvious. In 2009, the American Society of Civil Engineers looked at various infrastructure, including bridges, dams, roads, railways, water supply and sewage treatment plants. Their *Infrastructure Report Card* awarded the USA a “D” grade, and estimated that it would take 2.2 trillion dollars to restore this infrastructure to good condition, assuming that work started immediately. That bill had gone up from 1.6 trillion dollars when they last issued such a report card in 2005.

Agriculture also has a maintenance deficit, but this has been masked by massive inputs of chemicals and energy. Farming depends fundamentally on one item of capital — soil — and this item has been literally blowing away in the wind. In the United States, around 3 cubic kilometres disappears into the oceans each year, about one kilogramme per square metre of farmland. This is a problem because even under good conditions, soil forms between 5 and 50 times more slowly than this. Even the soil that remains is becoming poorer and poorer in quality, because farmers harvest crops each year but fail to replace soil nutrients. This in turn means that the food they grow is itself less nourishing than it was a century ago.

But the situation today appears to be more than just a maintenance crisis. It looks as though a catabolic collapse is already in progress. Greer places the start of the collapse in 1974, because that was when the industrial heartland of the United States began to decline into the “Rust Belt.” Whether or not we agree with Greer’s choice of date, it is unarguable that the United States’ capacity to produce goods for itself — and the rest of the world — is now very much diminished. That productive capacity was not maintained and rebuilt, but instead it was allowed to disintegrate into waste.

So nowadays, although the United States still is a consumer, a large part of that consumption is satisfied by imports from the foreign countries which maintained and expanded their capital. For relatively low-tech consumer goods, the production happens in China, while high tech “producer’s goods” — machine-tools, precision components and advanced materials — are made in Japan or Europe.

In return for these imports of capital, the United States gives money to those other countries. The one thing which the United States *is* still producing in large quantities is money. But remember that money is not capital. Money is just a token promising to its holder some capital in the future. It appears extraordinarily unlikely that the United States can ever deliver on all those promises. When that realisation becomes common, the capital available to the United States will suddenly become much smaller.

Perhaps the clearest sign of catabolic collapse can be seen in oil production. (This is a problem for the whole world, but particularly for the United States because its need for oil is so great.) When we look back to 1930, the energy in one barrel of oil would be enough to find and deliver 100 barrels in return. By

1970 that had dropped to 25 barrels and by 1990 to around 15 barrels. Today, the energy in one barrel of oil would only be enough to find and deliver three barrels in return. The reason for this, of course, is that the easy to find, easy to extract oil was used first. The United States had the first oil industry, and its new oil discoveries peaked in 1930. United States oil production peaked 40 years later, in 1970. World oil discoveries peaked in the 1960s, which led to predictions that world oil production would also peak 40 years later, just after the start of the twenty first century.

Those predictions seem to have come true, and the prospects for the future were already clear enough in 1977 for President Jimmy Carter to propose, in a televised address to the nation, that investments should be made immediately in other energy sources. Nothing happened. Although action could have been taken in the 1970s, when the problem was already clear, nothing was done.

That failure to act brings us to the second symptom of collapse, **elite mismanagement**, and here the picture is even more dismal. In the face of a maintenance crisis, or even catabolic collapse, it's possible to use capital and resources differently, more effectively, and sidestep that collapse by bringing maintenance needs into balance with resources. But to achieve this, the establishment elite would need to change society's institutions, and reconstruct them into social instruments that solve society's problems. In the United States, the establishment elite shows no sign of doing this, in fact quite the reverse.

The establishment has, for at least a century and a half, been playing an infinite game of wealth — the aim being to accumulate the most money before you die. In the past, this infinite game has been supported by long-termers like President Franklin Roosevelt, who reformed society's institutions in the 1930s, despite squeals from other members of the establishment. However, the American establishment is nowadays dominated by short-termers who fiercely resist any attempt to change the institutions which bring them advantage. If they notice at all, they assume that the infinite game will always continue without any need for compromise.

In retrospect, we can pick out two particularly bad ideas promoted by the United States' establishment: **military Keynesianism** and **shareholder capitalism**. Although each of these ideas sprang from only a handful of minds, they were supported by most of the establishment in thousands of individual choices. Not so much a conspiracy as a convergence of self-interest.

Military Keynesianism began in 1950 with the decision by President Harry Truman to place the United States on a permanent war footing. Only the military spending of the Second World War had finally pulled the United States out of the great economic depression of the 1930s. After that war was over, the establishment worried that people would not have enough money to buy all the goods that were being produced, even though they wanted them and needed them. (This had been

the essential problem in the 1930s.) The result could be another depression, which would be bad for profits and spoil the infinite game of wealth.

Rather than take a chance, the establishment decided to keep military spending by the government at wartime levels. Historian Chalmers Johnston coined the term “military Keynesianism” as a shorthand for government expenditure intended to boost the economy, but disguised as a military necessity. In the 1950s, it certainly did the trick — it put money in the pockets of ordinary Americans, and it put even more money in the pockets of the establishment, the people who owned and operated the arms factories. But this source of income became indispensable to the establishment, and it continued decade after decade. It’s hard to be precise, and hard to decide exactly what to include, but it’s not too far from the truth to say that for many years the United States government spent around half its budget this way. The United States spent more preparing for war than *the rest of the world put together*.

Now the objection could be made that the United States *needed* to spend this money, as it faced up to the Soviet Union in the Cold War. But fragments of evidence tend to show that the primary purpose was indeed to spend the money, not to achieve a military aim. For a start, an incredible amount of money was just wasted. In 2001, Defense Secretary Donald Rumsfeld admitted that the Department of Defense had lost track of a total of 2.3 trillion dollars. They knew they had spent it on something, they just didn’t know what they had got in return.

The weapons purchased by the Americans were often half-hearted. In contrast, Soviet weapons were invariably serious and robust. For example, in 1976 a Soviet pilot stole his MIG-25 interceptor and landed it in Japan. When Western experts took the aircraft apart, they were at first amused by its archaic valve electronics. Then they realised that although old-fashioned, the electronics would continue to work after the electromagnetic pulse of a nuclear explosion, unlike the electronics in their own aircraft. It was designed for war.

However, the clearest evidence that the United States military expenditure was primarily for economic purposes comes from what happened — or rather didn’t happen — when the Soviet Union collapsed at the end of the 1980s. For the whole of the following decade, the military expenditure continued unabated, even though the former enemy was no longer a threat. If the Cold War was really a war, surely there should have been a demobilisation? It was more than ten years before the amorphous enemy in the “war on terror” appeared to justify the expenditure.

If military Keynesianism boosted the economy, why was it such a bad thing? It was bad because capital and resources devoted to the military were not available to satisfy the other needs of society. Civilian capital of all kinds went unmaintained — physical, social, human and intellectual — while the capital produced by the arms factories was itself fundamentally unproductive, just half-a-step away from waste. (Remember that a bomb never *makes* anything — its job is to turn itself and

its target into waste.)

The other particularly bad idea promoted by the establishment was **shareholder capitalism**, a concept invented in the 1970s and elevated to dogma in the following decades. Shareholder capitalism is the principle that the interests of the owners of a company are paramount, and the interests of workers, customers and society at large count for nothing. (You may be surprised to learn that before the 1970s, it was generally accepted that companies had a duty to those other parties — sometimes poorly fulfilled, but expected nonetheless.)

Shareholder capitalism was tenuously justified on the grounds that if profit was the only concern, companies would become more efficient and so in the end everyone would benefit, not just the owners. Furthermore, the cheerleaders for shareholder capitalism insisted that anything which stood in the way of profits was bad, and government regulation was especially bad.

From our perspective, we can see that this was merely a self-serving play by establishment short-termers, keen to gain an advantage in the infinite game of wealth. They certainly succeeded at that. By 2011, the establishment share of wealth in the USA was at an all-time high, while the bottom half of the population had essentially nothing — debts and assets on average cancelling out. However, by promoting the dogma of shareholder capitalism, the short-termers had a hugely corrosive influence on social instruments and they also rendered the establishment as a whole quite incapable of any long-term decisions.

To see the corrosion, you have only to ask yourself: why would anyone, in an enterprise motivated solely by the greed of the owners, seek anything other than their own personal advantage? Even some of the short-termers recognised that they had an **agency problem**: how could their agents, the company managers, be expected to act greedily on behalf of the owners, but have better moral standards when they acted on behalf of themselves? The only workable solution to this conundrum was to accept that, at least for company officers, greed was intrinsically good. (Those in the lower ranks of companies were expected to behave more honourably, and wait for the wealth to “trickle down” to them.)

So, personal and corporate greed were aligned perfectly, and the managers who acted for the owners were rewarded obscenely well for taking narrow, short term decisions. Firms were broken up and capital destroyed rather than make long-term investments which would take years to pay off. The establishment hired politicians to revoke laws regulating business, with the promise that “free market capitalism” would be better for everyone. Manufacturing companies closed their factories and morphed into importers and finance companies. The way this played out is perhaps best summarised by musician Frank Zappa, who in 1989 said:

THE VERY BIG STUPID is a thing which breeds by eating The Future. Have you seen it? It sometimes disguises itself as a good-looking

quarterly bottom line, derived by closing the R&D Department.

By 2011, the situation was sufficiently dire that establishment long-termers were saying the same thing in public. For example, economist Paul Roberts, formerly Assistant Secretary of the Treasury under President Ronald Reagan, wrote:

Conservatives and especially libertarians romanticize “free market unregulated capitalism.” They regard it as the best of all economic orders. However, with deregulated capitalism, every decision is a bottom-line decision that screws everyone except the shareholders and management.

In America today there is no longer a connection between profits and the welfare of the people. Unregulated greed has destroyed the capitalist system, which now distributes excessive rewards to the few at the expense of the many.

If Marx and Lenin were alive today, the extraordinary greed with which Wall Street has infected capitalism would provide Marx and Lenin with a better case than they had in the 19th and early 20th centuries.

The establishment elite will always play some kind of infinite game. Because they were not concerned about the future of their infinite game, because they treated it as a finite game and tried only to win, the short-termers obtained more wealth and became dominant in the establishment. The balance between “rationality” and “collective suicide” depends on whether the long-termers or the short-termers have the upper hand. As I write, in the United States the balance is clear.

Let’s now turn our attention to the remaining precursor of collapse, **external shock**. Some external shocks, for example the the Huns in the late Roman empire, actually arrive quite slowly. If we look around, we might already be able to see signs of what will unfold in the future. (Though whether that would change our decisions, any more than it did in late antiquity, is another matter.) Other external shocks are “black swans” which arrive without warning, but from the perspective of the *longue durée*, we can see that they are regular visitors. Although timing will always be a mystery, we can catalogue these visitors and consider how prepared we are to meet them.

In the category of external shocks which arrive slowly, one obvious candidate is “global warming.” Clearly this is perceived, like the Huns, as not such a big deal, because nothing much is being done about it. Whether this is the right judgement remains to be seen — there’s too much uncertainty in the climate models to be sure,

particularly concerning the soil as a carbon reservoir. If climate change does turn out to be a serious problem, there seem to be technical fixes that we could apply — provided our civilisation has not already collapsed. For example, we could inject sulphur dioxide into the upper atmosphere, reflecting sunlight and cooling the earth. (One explanation for the lack of warming over the past decade is that the new Chinese coal-fired power stations, burning sulphurous coal, have had exactly this effect already.)

The catalogue of other, faster-moving external shocks is so long and varied that it would read like a shopping list of disaster movies. It must include earthquakes, tsunamis, volcanoes, asteroid impacts, solar mass ejections, plagues and of course wars. Mostly these would not be overwhelming in themselves, but in a brittle society, even a small disaster could be the last straw. Most Western societies, but particularly the United States, have become dramatically more brittle over the past few decades.

Structuring a whole society without slack so as to make slightly more profit for the owners is not a very clever move. “Just in time” can easily turn into “far too late.” Engineer and writer Dmitry Orlov, who had first-hand experience of the collapse of the Soviet Union, describes how people in Russia muddled through their crisis. They survived the chaos and crime and violence precisely because in the Soviet Union there was so much inefficiency. With this cushion of slack and a stock of robust easy-to-maintain capital they mostly survived the experience. Western civilisation is not so well prepared.

So ... what *are* our prospects? Firstly, it’s important to realise that there *are* technical things which we could do to improve our position, even in the face of apparent catabolic collapse. Our primary need is for electricity. If we don’t have that, we have nothing. Clearly, while we still have capital and resources based on fossil fuels, we should build some new capital in the form of “renewable” electricity generation, and try to make its maintenance requirements as small as possible. But that won’t be enough.

We also need a substantial number of nuclear power plants, but they would have to be better designed, with radically reduced maintenance requirements. (A possible candidate here is the “travelling wave reactor” promoted by philanthropist Bill Gates. This uses as fuel the nuclear waste which we would otherwise have to guard at great expense.) Ideally, we would like to be able to generate electricity even more straightforwardly, maybe by cold fusion if that were ever really possible. (Interestingly, the US Navy — pragmatic as ever — continues to experiment with cold fusion despite the scientific world turning its back on the idea. Who knows? Maybe there’s something in it after all.)

As well as securing our electricity supply, we should ensure that other physical capital is made robust and durable, not designed merely for “profit” and thrown away after a short working life. We should also ensure that our human capital is

more effective and needs less maintenance. (If you wonder what that might look like, go back and re-read the first part of this book.) And perhaps most importantly, we should ensure that we have better social capital — social instruments, not institutions.

In fact, I believe that we will only achieve success in all those other things if we can reform today's institutions and make them into social instruments. Many commentators on our present difficulties focus only on the technical problems, on our production crisis. They assume that if the case for a technical solution is clear enough, then the establishment elite will act and save the day. They forget, or do not notice, the problem of elite mismanagement. An establishment dominated by short-termers will continue to play what remains of their infinite game while civilisation crumbles around them. They will resist reform to the end.

Carroll Quigley characterised the ideology of Western civilisation as fundamentally optimistic, rejecting despair, believing “that the world is basically good and that the greatest good lies in the future.” I would like to be optimistic about the United States, but I find it difficult to imagine the American establishment reconstructing itself into the flower of Western civilisation. That would be the best outcome, but I fear that something dark and quite contrary to the Western spirit has taken root there. This darkness says that the world is basically bad, that the best is in the past, that the “greatest generation” have already come and gone. The darkness fears the collapse, and says: hold on to what you have, as long as possible. Whatever else happens, where the darkness rules, Western civilisation will have already met its end.

I suppose that I most fear the dark future in which the United States somehow hangs on without reform at the edge of collapse. The American establishment has in the past to been remarkably happy with slavery. I fear in the future they would be equally happy to rule as tyrants over a dispossessed underclass, slaves again in all but name. The worst aspect of this future is that the darkness would continue to seep out and poison the rest of Western civilisation.

If the United States did collapse, what would happen to the rest of Western civilisation, to the old heartland in Europe and to the “little Europes” scattered around the world? When the Soviet Union collapsed, that signalled the end of Communism around the world. If the United States collapses, that would signal an end to the global influence of the American short-termers, but I think Western civilisation itself is more robust. It survived partial catabolic collapse in the 14th century and has reconstructed itself at least twice since then. The fate of the scattered fragments of Western civilisation will depend on whether the various Western establishments avoid the darkness and manage to reform their own institutions. Piece by piece, survival is possible. It can still be true that “the world is basically good and that the greatest good lies in the future.”

The dominant influence over this new world would not be the United States. It would most likely be China — a very strange ending to our earlier tale of blood and gold. An ending which would have seemed impossible a century ago. What would that mean? What impact would a dominant China have on the remains of Western civilisation? It would depend on how much the tendrils of Western civilisation have already penetrated into China. Today China simultaneously venerates as patron saints the political philosophers Karl Marx and Adam Smith — both as Western as you can get. The Confucian past is still there, but China has gone through such epic changes over the last century and a half that it's extremely unclear what the civilisation of China really is right now. Perhaps it is a mixture, gestating into something new. Historian Giovanni Arrighi, consciously thinking of the *longue durée*, has speculated that China might be the next leader of capitalism, last in a trail leading over the centuries from Genoa to Holland to Britain to the United States. Perhaps, but capitalism is not the same as Western civilisation.

On the other hand, the Chinese establishment is certainly keen to make the future of its people better than their past, if only out of a sense of self-preservation. The idea that “the greatest good lies in the future” is a key element of internal propaganda, and probably a genuine aim. But the Chinese Communist Party is an unlikely home for the spirit of Western civilisation. (Imagine the Mafia with an HR Department and an encrypted telephone network. To a first-order approximation that is the Chinese Communist Party.) We will have to wait and see.

In the end, the fate of Western civilisation will probably be determined most of all by the nature of the infinite game played by our establishment elite. The infinite game of wealth seems to have reached a natural limit, but it is not the only game. The establishment in our past has certainly played rather different games — the original Royal Society and later echoes, like the Lunar Society, valued truth and beauty more than money. Money was *necessary*, but truth and beauty were *important*. A crucial distinction. Then, somehow, the accountants came to rule our hearts. But there are worlds beyond money: the smile of a baby in your arms; the sound of the sea at sunset; the tears of the mourners at a graveside. Money is necessary, but money is not everything.

Time to choose a different game.

Chapter 11

Over to You

Tyrants can live happily amidst slavery, provided they are the masters. Tyrants can live happily in a police state, provided they are the oppressors. Tyrants will happily see our civilisation crumble to dust, provided they get the biggest pile of dust. But they need help.

Look at yourself. Be honest. Few people *are* tyrants, but many people *help* tyrants. Are you one of the tyrants' little helpers? In the scam operated by the tyrants, there are many skills. They are often marks who were innocently drawn into the scam, but now stay to get their share of the payoff. There are "enforcers" who punish dissent. There are "enthusiasts" who cheer-on the tyrants and excuse their greed. But once you consciously notice the scam, and realise that it is immoral, you cannot participate innocently any more. What are you going to do?

Carroll Quigley summarised Western civilisation in the phrase "the truth unfolds in time through communal effort." We never see a final truth, just closer and closer approximations. I have struggled in this book to carry you and me closer to the truth. In writing it, I certainly learned some new things. I've made mistakes, I'm sure. Maybe you can do better, build on this. Let me know.

In a thousand years from now, when the Clock of the Long Now next strikes the millennium, what will history show? Few of us can do anything significant, but if we all do nothing, we hand victory to the tyrants, and most likely oblivion to everyone.

So what should you do now? I can't tell you what to do. The right thing is going to depend on who you are and where you are. So look around. See clearly. Make up your own mind. Work together. Find the right thing. Do it.

Good luck.

Appendix A

Notes

This book is a draft. I'd be delighted to receive any comments you have that could make it better. You can contact me at www.stuartwray.net.

Body

- Page 2 Overview of the story of scurvy: *Scott and Scurvy* by Maciej Cegłowski (Online at idlewords.com, March 2010).
- Page 2 Scott's knowledge about scurvy in 1911: *State of knowledge about scurvy in 1911* by D E Lewis (Proc. Royal Society of Medicine, vol 65, Jan 1972 pp39-42).
- Page 4 On Lind, Trotter and Blane: *Sailors' scurvy before and after James Lind – a reassessment* by Jeremy Hugh Baron (Nutrition Reviews, vol 67(6), 2009, pp315-332).
- Page 8 Szent-Gyögyi's remarks are from a letter to Linus Pauling, quoted in *How to Live Longer and Feel Better* by Linus Pauling (1986).
- Page 8 A nutritionist who read an early draft of this chapter noted that some people complain of stomach ache or diarrhoea when they take too much vitamin C, but this goes away when they reduce the dose, and is "nothing compared with the side effects of most drugs."
- Page 9 Gesch's experiments on prisoners: *Full of Goodness* by Mark Peplow (New Scientist, 16 Nov 2002, pp38-41) and *Influence of supplementary vitamins, minerals and essential fatty acids on the antisocial behaviour of young adult prisoners: Randomised, placebo-controlled trial* by C. Bernard Gesch et al. (British Journal of Psychiatry vol 181, 2002, p22).
- Page 10 On vitamin D, see for example: *Vitamin D Beyond Bones in Chronic Obstructive Pulmonary Disease: Time to Act* by Wim Janssens et. al. (American Journal of Respiratory and Critical Care Medicine, 179(8) pp630-636, 15 April 2009), *Vitamin D better than vaccines at preventing flu, report claims* by Oliver Gillie (The Times, 15 March 2010), *Randomized comparison of the effects of the vitamin D3 adequate intake versus 100 mcg (4000 IU) per day on biochemical responses and the wellbeing of patients* by Reinhold Vieth et. al. (Nutrition Journal 3(8), 19 July 2004).

- Page 10 Reinhold Vieth quote is from: *Vitamin D casts cancer prevention in new light* by Martin Mittelstaedt (The Globe and Mail, 28 April 2007).
- Page 10 On omega-3, see for example: *The happy fat* by Meredith F. Small (New Scientist, 24 August 2002, p34-37), *The Omega Point* (The Economist, 21 Jan 2006, pp80-81).
- Page 11 The best book on the science of carbohydrates, sugar and obesity is probably *Why We Get Fat: And What to Do about It* by Gary Taubes (Knopf, 2010). **If I had to select one book that you really must read next, this is it.** Slightly older, but with more detail on the history: *Good Calories, Bad Calories: Fats, Carbs, and the Controversial Science of Diet and Health* by Gary Taubes (Anchor Books, 2008). This paper is a meta-analysis of 21 other studies: *Meta-analysis of prospective cohort studies evaluating the association of saturated fat with cardiovascular disease* by Siri-Tarino, Sun, Hu and Krauss (American Journal of Clinical Nutrition, 91(3) pp535-46, March 2010). It notes that “there is no significant evidence for concluding that dietary saturated fat is associated with an increased risk of coronary heart disease or cardiovascular disease.”
- Page 13 On fructose biochemistry and why sugar is bad: *Sugar: The Bitter Truth* by Robert Lustig (Lecture available on YouTube, July 2009).
- Page 13 On the properties of sleep: *Deep into sleep* by Craig Lambert (Harvard magazine, July-Aug 2005, pp25-33).
- Page 15 It's odd really, how little we seem to know about our bodies and our health. Bad practice and out-dated explanations seem to persist a lot longer than they should. The truth, when it appears, can often be rather surprising. For example, who would have guessed that brushing your teeth twice a day could help prevent heart disease and stroke? (See *Toothbrushing, inflammation, and risk of cardiovascular disease: results from Scottish Health Survey* by de Oliveira, Watt and Hamer (British Medical Journal, 27 May 2010).) Or that the problem with resuscitation after someone's heart has stopped for a long time is not the absence of oxygen — “oxygen starvation” — but rather its return, which causes mitochondria to self-destruct. Climbers in the Himalayas have a rule of thumb, that “you're not cold and dead until you've been warm and dead first.” Recent medical experience confirms that hypothermia helps a lot when resuscitating the not-quite-dead, as does xenon gas. Some time in the future, perhaps this will be standard practice.

Morals

- Page 17 The quote about Freud being wrong and dead was related in the

- lecture *From Dissociation to Repression* by Jeremy Wolfe (Lecture 17 of the MIT course 9.00 Introduction to Psychology, Fall 2004, available online from MIT OCW).
- Page 18 On the adaptive unconscious: *Strangers to Ourselves: Discovering the Adaptive Unconscious* by Timothy D. Wilson (Belnap Press of Harvard University Press, 2002), *Blink* by Malcolm Gladwell (Allen Lane, 2005) and *How We Decide* by Jonah Lehrer (Houghton Mifflin Harcourt, 2009).
- Page 21 On Paul Ekman and emotions: *Emotions Revealed* by Paul Ekman (Phoenix, 2004).
- Page 21 On moral categories: *The New Synthesis in Moral Psychology* by Jonathan Haidt (Science, Vol 316, 18 May 2007, pp998–1002).
- Page 25 On the relationship between political beliefs and moral values, see: *Liberals and Conservatives Rely on Different Sets of Moral Foundations* by Jesse Graham, Jonathan Haidt, and Brian A. Nosek (Journal of Personality and Social Psychology, 2009, 96(5), pp1029–1046). For a more direct correspondence between disgust and political beliefs, see: *Disgust Sensitivity and the Neurophysiology of Left-Right Political Orientations* by Kevin Smith et al (PLOS ONE 6(10), October 2011).
- Page 25 What are morals like in Afghanistan? See *The Places In Between* by Rory Stewart (2005).
- Page 26 Descriptions of the “strict father” and “nurturing parents” styles of parenting are from a guest lecture by George Lakoff to the PolySci179 class at Berkeley in the spring term of 2007. This was once available online, but appears to have been lost in a website reorganisation.
- Page 28 The statistic on mothers going back to work is from *The Coming Collapse of the Middle Class* by Elizabeth Warren (UC Berkeley Jefferson Memorial Lecture, 8 March 2007).
- Page 28 On rates of divorce and separation: *The End of Men* by Hanna Rosin (The Atlantic, July/August 2010).
- Page 28 Babies do know right from wrong: *The Moral Life of Babies* (New York Times, May 2010) and *The New Science of Morality* by Paul Bloom (A talk at the EDGE Conference, 20–22 July 2010).
- Page 29 On autism and Asperger’s syndrome: *Opinion Interview with Simon Baron-Cohen* by Liz Else (New Scientist 14 April 2001, pp42–45) and *The Essential Difference* by Simon Baron-Cohen (2004).
- Page 30 The “I’ve been frightened myself” comment is from *Psychopaths among us* by Robert Hertz (Saturday Night Magazine, 2001).
- Page 31 Indicators of psychopathy are taken from check-lists in *Without Conscience* by Robert Hare (1992) and *Snakes in Suits* by Babiak and Hare (2007).

- Page 32 For a slightly different view of psychopaths, emphasising that it isn't black and white, that there really is a spectrum of psychopathy, see *The Psychopath Test* by Jon Ronson (2011).
- Page 32 The Curveball story is from the article '*Curveball*' speaks, and a reputation as a disinformation agent remains intact by John Goetz and Bob Drogin (Los Angeles Times, 18 June 2008).
- Page 33 Interviews and presentations by James Fallon on psychopathy: *Exploring the Mind of a Killer* by James Fallon (TED conference talk, February 2009), *Three Ingredients for Murder* by James Fallon (Reason TV, 19 August 2010), *The Psychopathic Brain* by James Fallon (BBC *All in the Mind* programme, 26 April 2011) and *The Mind of a Dictator* by James Fallon (Talk at Oslo Freedom Forum 2011, 9 June 2011).

Truth

- Page 38 People tend to start by believing what they hear, and have to make an effort to disbelieve it: *Yes! 50 secrets from the science of persuasion* by Goldstein NJ, Martin SJ, Cialdini RB (Profile books, 2007) — see chapter 49, p178.
- Page 39 Denials can make stories more plausible: *Persistence of myths could alter public policy approach* by Shankar Vedantam (Washington post, 4 September 2007, A03).
- Page 40 The story about magician Harry Blackstone is from p129 of *The Mind's Past* by Michael Gazzaniga (University of California Press, 1998).
- Page 40 Demonstrations that people notice a lot less than they think can be found in these papers: *Gorillas in our midst: Sustained inattentive blindness for dynamic events* by Simons DJ, Chabris CF (Perception vol 28, pp1059–1074, 1999) and *You do not talk about Fight Club if you do not notice Fight Club: Inattentive blindness for a simulated real-world assault* by Chabris, Weinberger, Fontaine, Simons (i-Perception vol 2, pp150–153, 2011).
- Page 41 The beach-ball experiment of Michal Miller is related in Gazzaniga 1998, p130.
- Page 41 On memory reconsolidation, see *How our brains make memories* by Greg Miller (Smithsonian magazine, May 2010).
- Page 44 For the effect of the cheeky “because,” see Goldstein et al 2007, chapter 38, p140.
- Page 51 You might like to try this book on logical thinking — it has lots of exercises for you to practice on: *Critical reasoning: a practical introduction (3rd Ed.)* by Anne Thompson (Routledge, 2009).
- Page 52 Caffeine increases persuasiveness of strong arguments, but has no effect on persuasiveness wrong arguments: *Caffeine, Cognition and*

- Persuasion: Evidence for Caffeine Increasing the Systematic Processing of Persuasive Messages* by Pearl Y. Martin, Jenny Laing, Robin Martin and Melanie Mitchell (Journal of Applied Social Psychology, 2005, 35(1), pp160–182).
- Page 52 Addiction to nicotine is as bad as cocaine or heroin according to a report “Nicotine Addiction in Britain” from the Royal College of Physicians, quoted in *Nicotine ‘is as addictive as cocaine and heroin’* by Jeremy Laurance (The Independent, 9 February 2000).
- Page 53 On the possible benefits of depression: *The Bright Side of Being Blue: Depression as an Adaptation for Analyzing Complex Problems* by Paul W. Andrews and J. Anderson Thompson, Jr. (Psychological Review, 2009, vol 116 No 3 pp620–654). An easier to access account of this idea can be found in *Depression’s Upside* by Jonah Lehrer (New York Times Magazine, 25 Feb 2010) with further discussion on Lehrer’s website (recapping a lot of the arguments which were actually dealt with in Andrews and Thompson’s paper, but which many people had not been able to access).

Tricks

- Page 57 Cialdini’s classic textbook is *Influence, 5th Ed.* by Robert B. Cialdini (Pearson, 2009). He gives a nice precis of his findings in the lecture *The Secret Impact of Social Norms* by Robert B. Cialdini (RSA lectures 2007, available online).
- Page 60 See *Thinking, Fast and Slow* by Daniel Kahneman (Allen Lane, 2011) for a thorough account of “prospect theory,” and the experiments which revealed the nature of loss aversion, the sunk costs fallacy and the endowment effect.
- Page 60 A related phenomenon is the “fickle-friend” effect, which works like this: you do a favour for a friend, which you easily remember. Time passes, and your friend takes their post-favour state for granted. Then you ask for a favour in return, which seems to you like *reciprocity*, but seems to your friend like a *loss* — particularly since your friend valued it as a gain when he got the favour, but he now values it as a loss when he’s repaying it! Even if he remembers the favour properly, it still seems like an overall loss!
- Page 63 The “Drive Safely” story is from Cialdini 2009, p64.
- Page 63 The “small commitments” quote is from Cialdini 2009, p66.
- Page 65 On the effect of attractiveness, see Cialdini 2009, p146.
- Page 69 This other taxonomy of scams is described in *Understanding scam victims: seven principles for systems security* by Frank Stajano, Paul

- Wilson (University of Cambridge Computer Laboratory Technical Report number 754, August 2009).
- Page 70 An example of being tempted into an e-mail scam is described in *The psychology of scams: Provoking and committing errors of judgement* by University of Exeter School of Psychology (Technical Report OFT1070, Office of Fair Trading, May 2009).
- Page 70 On the value of censored material, see Cialdini 2009, p210.
- Science**
- Page 73 The interview with Simon Schaffer is from the radio series *Ideas: How to think about science* (First broadcast by CBC on 29 November 2007 Online at cbc.ca/podcasting). The “one image” quote by Simon Schaffer is from episode 1, at 0:40.
- Page 73 The “very unpleasant” quote by Simon Schaffer is from *How to think about science* episode 1, at 40:45.
- Page 74 The book about Boyle and Hobbes that caused Shapin and Shaffer such trouble is *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* by Steven Shapin and Simon Schaffer (1985).
- Page 74 The “good idea to get rid of it” quote by Simon Schaffer is from *How to think about science* episode 1, at 16:15.
- Page 79 For examples of rogue scientists deliberately “gaming” the network of trust, see *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*, by Naomi Oreskes and Erik M. Conway. (2010). For more on ghost-written medical papers, see *How drug companies' PR tactics skew the presentation of medical research* by Elliot Ross (Guardian, 20 May 2011).
- Page 79 On legal wrangling over the Large Hadron Collider, see *The Black Hole Case: The Injunction against the end of the world* by Eric E. Johnson (Tennessee Law Review, vol76:819 pp819–908, 2009). See especially “Escaping the vortex,” from p886.
- Page 83 If we had to pick the “holy scriptures” of Bayesian reasoning, we would probably end up with a list including at least the following: *Theory of Probability, 3rd Ed.* by Harold Jeffreys (Oxford 1983), *Probability Theory: The Logic of Science* by Edwin Jaynes (Cambridge 2003), *Information Theory, Inference and Learning Algorithms* by David MacKay (Cambridge 2003) and *Causality: Models, Reasoning and Inference* by Judea Pearl (Cambridge 2000).
- Page 85 The source for Gigerenzer’s cancer quiz is *Helping Doctors and Patients Make Sense of Health Statistics*, by Gigerenzer G, Gaissmaier W, Kurz-Milcke E, Schwartz L, Woloshin S. (Psychological Science in the Public Interest, 8(2), pp53–96, November 2007).

- Page 89 Provocatively titled, but disturbingly perceptive: *Why Most Published Research Findings Are False* by John P. A. Ioannidis (PLoS Medicine 2, pp101–106, August 2005).
- Page 89 A nice overview of survivor bias, and so on: *Odds are, it's wrong* by Tom Siegfried (Science News, 177(7), 27 March 2010).
- Page 90 “Truth unfolds in time through a communal process” is from p339 of *The Evolution of Civilizations* by Carroll Quigley (Macmillan 1961).

Patterns

- Page 92 Biographical details on Quigley are from Harry Hogan’s foreword to Quigley 1961.
- Page 93 List of “human needs” is from Quigley 1961, p101.
- Page 93 Definition of instruments and institutions: Quigley 1961, p101–102.
- Page 94 See *The Goal: A Process of Ongoing Improvement* by Eliyahu Goldratt (North River Press; Second Revised edition, May 1992).
- Page 95 For Parkinson’s law, the original article is: *Parkinson’s Law* by C. Northcote Parkinson (Economist 19 Nov 1955).
- Page 95 Most terrorist organisations are institutions, not instruments: *What Terrorists Really Want: Terrorist Motives and Counterterrorism Strategy* by Max Abrahms (International Security, Vol 32, No 4, Spring 2008, pp78–105).
- Page 97 Comments on the Hundred Years War from Quigley 1961, p104.
- Page 97 For finite and infinite games, see *Finite and Infinite Games: A Vision of Life as Play and Possibility* by James P. Carse (Ballantine Books, 1986). For a talk on the subject, see *Religious War in the Light of the Infinite Game* by James P. Carse (Long Now seminar, Jan 2005).
- Page 98 The explanation of *dignitas* in the Roman Republic is from p374 and pp386–387 of *Weapon Systems and Political Stability* by Carroll Quigley (University Press of America, 1983).
- Page 101 Weber’s definition of sovereignty is from the lecture *Politik als Beruf (Politics as a Vocation)* by Max Weber (Lecture at Munich University, 1918). In it he also gives an interesting, and still relevant, commentary on the operation of politics in the United States.
- Page 102 The list of the aspects of sovereignty is from *Public Authority and the State in the Western Tradition: A Thousand years of Growth 976–1976* by Carroll Quigley (Oscar Iden series of lectures at Georgetown University 1976).
- Page 102 The example of Mexican drug cartels is from *The Murderers of Mexico*. by Alma Guillermoprieto. (New York Review of Books, 28 October 2010).

- Page 104 On the power of New York bankers to make law, see *Wall Street's War* by Matt Taibi (Rolling Stone, No 1106, 10 June 2010). The figure of one billion dollars on lobbying is from *The Empty Chamber* by George Packer (The New Yorker, 9 August 2010).
- Page 106 For a history of the equal protection clause, see *Cold Case Democracy: Part one - Breaking and Entering* by Vi Ransel (Global Research, 24 January 2010).
- Page 107 The idea of a cold civil-war is from *Spook Country* by William Gibson (Viking, 2007).

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- Page 108 The “single funeral pyre” quote is recounted in: *The Fall of the Roman Empire: A New History* by Peter Heather (Pan, 2006). There’s an interesting speculation in *How the Irish Saved Civilisation* by Thomas Cahill (1996) that St. Patrick’s escape from slavery in Ireland may have happened at exactly this time. If his boat landed in Gaul, not Britain, then his report of walking 2 weeks without seeing man nor beast could be a simple report of the aftermath of the invasion.
- Page 110 See *An Inquiry into the Nature and Causes of the Wealth of Nations* by Adam Smith (1776).
- Page 113 For one version of the story of Lawrence of Arabia, see *How David beats Goliath* by Malcolm Gladwell (New Yorker, 11 May 2009).
- Page 114 A book about baseball which gives another good example of “underdog” thinking: *Moneyball: The art of winning an unfair game* by Michael Lewis (2003).
- Page 114 The classification of attacks is from *Tremble the Devil: The story of terrorism as Jesus Christ, James Bond and Osama Bin Laden would tell it* (www.tremblethedevil.com).
- Page 115 The story of the Irish rebellion is from *The Rising — Ireland: Easter 1916* by Fearghal McGarry (2010).
- Page 117 For background on the Mukden Incident, see *The Mukden Incident: September 18-19, 1931* by Robert H. Ferrell (Journal of Modern History, 27(1), March 1955, pp66-72).
- Page 119 Examples of reciprocation in the World War I trenches are described in *Critical Mass: How one thing leads to another* by Philip Ball (Heinemann, 2004).
- Page 119 Out of the countless books on warfare in general, perhaps you might like to have a look at *The Art of War* by Sun Tzu (Written around 500 BC), *Small Wars Manual* by United States Marine Corps (1940) and *Attacks* by Erwin Rommel (Athena Press, 1979). Another useful book is the encyclopedic tome *Security Engineering (2nd Ed.)* by Ross

- Anderson (Wiley, 2008). This last volume might seem to be from a different genre, but think about it and you will appreciate its relevance.
- Page 120 The difference between lethal weapons and shock weapons is described in Quigley 1983.
- Page 120 On Japan's adoption and abandonment of firearms, see *Giving Up the Gun: Japan's Reversion to the Sword, 1543-1879* by Noel Perrin (1979).
- Page 121 For Lanchester's N-Squared law, see *Mathematics in Warfare* by Frederick Lanchester (In *The world of Mathematics*, James R. Newman (Ed.), 1956. See vol 4, pp2138-2157).
- Page 121 On how most soldiers don't like to kill, see *On Killing: The Psychological Cost of Learning to Kill in War and Society* by Dave Grossman (2009).
- Page 122 On the difference between murderers and soldiers, see *A History of Warfare* by John Keegan (1993).
- Page 122 Examples of "stoned" behaviour of soldiers in Iraq can be seen in *The Wounded Platoon* (PBS May 2010; BBC2 August 2010).
- Page 123 On the difference between professional and amateur weapons, see Quigley 1961, pp397 ff.
- Page 124 Quote about amateur warfare in the buffer fringe from Quigley 1961, pp402-403.

Promises

- Page 129 Metal content of the silver denarius: *In search of the eternal coin: A long finance view of history* by Malcolm Cooper (Long Finance, Z/Yen Group Limited, 2010).
- Page 139 On Montagu Norman's deception, see *Monetary Policy and Expectations: Market-Control Techniques and the Bank of England, 1925-1931* by John R. Garrett (The Journal of Economic History, vol 55, issue 3, 1996, pp612-636).
- Page 139 Details of gold levels and flows are from *Good as Gold* by Chris Weber (2011).
- Page 140 The 1973 quote from the Kuwaiti oil minister is from p595 of *The Prize: The epic quest for oil, money and power* by Daniel Yergin (Simon and Schuster, 1993).
- Page 140 The US inflation figures from 1973 to 2011 are derived from data on the financial statistics website "Shadowstats": *Shadow Government Statistics: Analysis Behind and Beyond Government Economic Reporting* by John Williams (www.shadowstats.com, 2011).

Blood and Gold

- Page 143 “Our future history ...” see p42 of *Sand Against the Wind: Stillwell and the American Experience in China 1911-45* by Barbara Tuchman (Futura, 1981).
- Page 143 Sea otter pelts, see p183; coal, see p189 of *Breaking Open Japan: Commodore Perry, Lord Abe and American Imperialism in 1853* by George Feifer (Smithsonian Books, 2006).
- Page 143 Perry humourless, Feifer p77.
- Page 145 Reception in new building, Feifer p117 ff.
- Page 145 Perry’s fourth letter, Feifer p126.
- Page 146 Perry’s plan for 1854 return, Feifer p223 ff.
- Page 146 Abe delays one year, Emperor says melt down bells, Feifer p253.
- Page 146 1858 Treaty of Amity and Commerce, Feifer p280.
- Page 147 China trade, Tuchman pp31-35. First Opium War, Feifer p193 ff. Russell and Company, Feifer p215.
- Page 148 Taiping rebellion, Tuchman p35.
- Page 148 Second Opium War, Feifer p279.
- Page 148 1860 samurai visit to US, Feifer p284.
- Page 149 British indemnity, Feifer p295.
- Page 149 Satsuma, Choshu dominate Meiji government, Feifer p302.
- Page 149 “Enrich the Nation, Strengthen the Military,” Feifer p303.
- Page 150 Okinawa, Feifer p153 ff.
- Page 151 Sino-Japanese war, see Tuchman p34 and p17 ff of *Gold Warriors* by Sterling and Peggy Seagrave (Bowstring Books, 2002).
- Page 151 Murder of Queen Min, Seagrave p14.
- Page 151 Salisbury’s concern about Russia and France, see p2 of *Churchill, Hitler and the Unnecessary War: How Britain Lost its Empire and the West Lost the World.* by Patrick J. Buchanan. (Three Rivers Press, 2008).
- Page 152 US-Britain appeasement, Buchanan p4. Britain’s fantasy of a special relationship, Buchanan p121. On this special relationship, see also comments in *At Home: A Short History of Private Life* by Bill Bryson (Doubleday, 2010), in particular the observation that in the late nineteenth century, about 1 in 10 of the British establishment had American wives with American money, so it’s possible that their children (like Winston Churchill) had a “mama will kiss it better” feeling about Americans in general. Needless to say this feeling was not reciprocated by members of the American establishment.
- Page 152 Boxer rebellion, Tuchman p40. Russia’s 200,000 man army, Buchanan p3.
- Page 152 1902 naval treaty, Buchanan p4. Japan-Russia war, 1904, Seagrave p17, Buchanan p5.
- Page 152 Plunder of Korea, Seagrave p19 ff.

- Page 153 “Revive China Society,” Tuchman p40. Chinese reform party and Kuang Hsu, Tuchman p39. Boxers, Tuchman p40.
- Page 153 Promise of constitution and elections 1905, Tuchman p41.
- Page 153 Sun Yat-sen in Japan and Hanoi, Tuchman p44.
- Page 154 Wuhan 1911 revolt, Tuchman p45. Half China industry in Shanghai, Tuchman p30.
- Page 154 Sun / Yuan President of China, Tuchman p50.
- Page 154 Japan seizes German possessions, Tuchman p58.
- Page 155 Washington Naval Conference 1921, Buchanan p116 ff. Treaty is a “major catastrophe” for Britain, Buchanan p120, quoting from *Collapse of British Power* by Correlli Barnet.
- Page 155 Three reasons for Britain abandoning Japan, Buchanan p121–122. Churchill quote, Buchanan p122.
- Page 155 Chiang “most astute,” Tuchman p335. Chiang background, Tuchman p116, Seagrave p25.
- Page 156 Sun Yat-sen “cult,” Tuchman p168. Chiang never free of challenges, Tuchman p153.
- Page 156 Manchurian incident, Tuchman p168, Seagrave p26. Pu-Yi, Tuchman p168. Stimson and Mukden incident, Tuchman p170.
- Page 157 90% of opium/heroin supplied by Japanese in 1937, Seagrave p30.
- Page 157 British attitude, Stimson’s position, Buchanan p126.
- Page 158 Attacks on Shanghai, Seagrave p32, Tuchman p172, also p29–31 of *Human Smoke: The Beginnings of World War II, the End of Civilisation* by Nicholson Baker (2008).
- Page 158 4th bandit suppression campaign, Tuchman p175.
- Page 158 Stimson “baffled,” Tuchman p175. Stimson’s retelling of Roosevelt’s Japanese conspiracy story is from pp301–302 of *On Active Service in Peace and War* by Henry L. Stimson and McGeorge Bundy (Harper and Brothers, 1948).
- Page 159 Stimson “loved peace so much,” Buchanan p127, quoting Tanshill.
- Page 159 Warren Delano and China, see p10 ff of *FDR* by Jean Edward Smith (Random House, 2008).
- Page 160 Roosevelt library, no notes at cabinet meetings, see p41 of *One Christmas in Washington: Churchill and Roosevelt Forge the Grand Alliance* by David Brecuson and Holger Herwig (Overlook Press, 2006).
- Page 160 Roosevelt’s deviousness, cannibalism quote, Brecuson and Herwig p39.
- Page 160 Isaiah Berlin quote, Brecuson and Herwig p40.
- Page 160 “Missy” LeHand Christmas quote, Brecuson and Herwig p157.
- Page 161 Stimson’s “topsy-turvy administration” quote, Brecuson and Herwig p47. Mencken’s “Holy Joe” quote, Brecuson and Herwig p55.

- Page 161 Amau Doctrine, opium, political penetration, the Long March, Tuchman p179-179.
- Page 162 Roosevelt has Picket and Fosdick to tea, Baker p54 (quoting Picket).
- Page 162 1937 Marco Polo bridge, Tuchman p208, Seagrave p36. 1937 china campaign should have been 90 days, Tuchman p213. Chiang won't surrender positions, Tuchman p209.
- Page 162 Chiang attacks Japanese in Shanghai, Tuchman p213. Shanghai casualties, Tuchman p214, Seagrave p37.
- Page 163 Rape of Nanking, Seagrave p37, Tuchman p224.
- Page 163 Nanking gold, Seagrave p38.
- Page 163 Japanese not prepared for war with USA, see p30 of *Day of Deceit: The Truth About FDR and Pearl Harbor* by Robert B. Stinnett (Touchstone, 2001).
- Page 164 Thomas Watson's medal, see p171 of *IBM and the Holocaust: The Strategic Alliance Between Nazi Germany and America's Most Powerful Corporation* by Edwin Black (2002).
- Page 164 Roosevelt "far more preoccupied" by Japan, Tuchman p221. "Navy is being run from the White House," Baker p82.
- Page 164 Events of 1939-40 in Europe, see for example *The Origins of the Second World War* by A.J.P. Taylor (1961).
- Page 164 Richardson objects to leaving fleet at Pearl Harbour, Stinnett p17-18, Baker p179.
- Page 165 Paris falls, mustard gas, comments of Churchill, Baker pp197-198.
- Page 165 See *1940: Myth and reality* by Clive Ponting (Elephant paperback, 1993). Total of 775 million pounds at start of 1940, Ponting p8. 10 billion dollars US orders at end 1940, Ponting p213.
- Page 165 Destroyers for bases trade in 1940, Smith p471-472.
- Page 166 USA peace-time draft, Baker p232. No foreign wars, Stinnett p17.
- Page 166 Roosevelt "more worried than any other thing" quote, Stinnett p28.
- Page 166 McCollum's 7 Oct 1940 memo, Stinnett p275.
- Page 167 McCollum background, Stinnett, p7.
- Page 167 McCollum delivers military and diplomatic intelligence, Stinnett, p15. Note that McCollum retained all the paperwork on file at his office and supplied Roosevelt with old reports as needed, so that there was no evidence to be found at the White House. This is just the sort of precaution that we might expect of Roosevelt, knowing his aversion to written evidence. But we know that Roosevelt got all these reports from Naval Intelligence because the "routing slips" have survived in the archives, even though the documents they covered are missing or still classified.
- Page 167 Anderson and Roosevelt, Stinnett p8, p35.

- Page 167 Richardson's meeting on 8 October 1940, Stinnett p11, Baker p239.
(Both from Richardson's book *On the Treadmill to Pearl Harbor*.)
- Page 168 Threat to imprison crypto people, Stinnett p256.
- Page 168 Radio fingerprints, Stinnett p53.
- Page 168 Friedman and Purple, see p22 of *The Codebreakers* by David Kahn
(1967).
- Page 168 J-series codes, Stinnett p70. PA code, Stinnett p113.
- Page 169 Japanese navy code, Stinnett pp70-71. SM code, 5-num code, Stinnett
pp75-77. 5-Num solutions in Radio Intelligence Publication 73 and 80,
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- Page 169 Tracking oil tankers, Stinnett p19-20. 80% Japanese petroleum from
USA, Smith p511.
- Page 169 Yamamoto war plans, Stinnett p30. Japanese oil needs, Stinnett p120.
- Page 169 Richardson fired, Kimmel appointed, Stinnett p36.
- Page 169 Japan war plan leaks to Grew, Stinnett p30.
- Page 170 Anderson appointed Commander Battleships, Stinnett pp34-36.
- Page 170 Contrast between Kimmel and Anderson choice of houses, Stinnett
p37.
- Page 170 Anderson warns off FBI, Stinnett p86.
- Page 170 Kimmel out of the loop, Stinnett pp37-38.
- Page 171 July 1941 "pop-up cruise," darkened cruisers, Stinnett pp9-10.
- Page 171 Dutch oil negotiations, Stinnett p42. Carrier building, Japan oil needs,
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- Page 171 World-wide recall of Japanese merchant fleet, Stinnett p129.
- Page 171 Article on air attack, Stinnett p121. 1938 exercise, Stinnett p147.
- Page 171 Morimura's work as Japanese consulate "outside man," Stinnett
pp89-92.
- Page 172 Morimura bomb-plot, 21 August 41, Stinnett p98.
- Page 172 Merchant vessels under Navy control, Stinnett p122.
- Page 172 Konoye makes peace offer, Smith p520. Konoye nearly assassinated,
Smith p522.
- Page 172 November 1941, Grew warns Washington, Stinnett pp142-144, Smith
p524.
- Page 173 Beardsall, naval aide, doesn't appear in usher book, Stinnett p169.
- Page 173 Marshall briefs reporters, Stinnett pp157-158.
- Page 173 Hitokappu Bay, Stinnett p47ff Modus Vivendi proposal from Japanese,
Smith pp525-529.
- Page 173 Marshall and Stark advise caution, Smith p524.
- Page 173 Exercise 191, Stinnett pp146-148.
- Page 174 "In a bizarre series of coincidences," Stinnett p146.
- Page 174 Exercise 191 cancelled early, Stinnett p150.

- Page 174 Kimmel tries to launch search fleet, Stinnett p151. Vacant Sea directive, Stinnett p144, p166.
- Page 174 Communications from Japanese fleet on leaving Hitokappu Bay, Stinnett p162 ff
- Page 175 Kimmel issues warning, Stinnett p166.
- Page 175 FDR pretends to Stimson he didn't get it, Stinnett p168. 10 point ultimatum to Japan, Stinnett p218, Smith p525.
- Page 175 "No satisfactory explanation," Smith p529.
- Page 175 Kimmel's carriers reassigned, Stinnett p152.
- Page 175 War warning, Stinnett p171-172.
- Page 176 Cabinet meeting 28 Nov, Stinnett pp179-180.
- Page 176 RDF reports not given to Kimmel, Stinnett p204.
- Page 176 Tanker radio message, Stinnett p205.
- Page 176 SS Lurline log, Stinnett p196.
- Page 176 Radio transmissions from Japan to fleet, Stinnett p184, p217.
- Page 177 Climb Mount Nitaka, Stinnett p218.
- Page 177 Consulates to burn code books, Stinnett pp112-113. Morimura says Pearl Harbor not on alert, 2 Dec, Stinnett p115. Morimura asked AA status Pearl Harbor, 6 Dec, Stinnett p113.
- Page 177 Declaration of war decoded in Washington, Stinnett p229.
- Page 177 Roosevelt finally sends message to Hirohito, Stinnett p178, Baker p441.
- Page 178 Stark and Roosevelt talk on phone at midnight, Stinnett p233.
- Page 178 Last two parts of Japanese message arrive Sunday morning, Stinnett p231.
- Page 178 Roosevelt's comments to Chinese ambassador, Baker p441.
- Page 179 Radar on Hawaii fails to give early warning, Stinnett p237.
- Page 179 Cabinet meeting Sunday evening, Smith p537.
- Page 179 Roosevelt's meeting with Murrow and Donovan, Stinnett pp1-5.
- Page 179 Kimmel relieved Stinnett p252. Stark pushed out, Stinnett p12, Smith p537.
- Page 179 Japanese initially welcomed, Smith p541.
- Page 180 On Stillwell's role in China, see Tuchman 1981.
- Page 180 Japanese looting in 1942, Seagrave p45 ff.
- Page 180 Mistreatment of POWs, fake hospital-ships, Seagrave p55-56.
- Page 181 Figure of 56 railway yards, 13 bridges from p377 of *No Bomb: No End* by Richard B. Frank (In *More What-If?* by Robert Cowley (Ed.), 2003).
- Page 182 Perry's flag used at 1945 surrender ceremony, Feifer p315.
- Page 184 Japanese hoards of treasure, Seagrave p63.
- Page 184 Bretton Woods and gold, Seagrave p99.
- Page 185 "Gold pot" comment from British, Seagrave p117. 1951 treaty quote, Seagrave p118. POW suffering down-played, Seagrave p56.

Page 185 See also the review article *The Looting of Asia* by Chalmers Johnson (London Review of Books, 20 November 2003). The Seagraves' book *Gold Warriors* was the subject of a stiff ignoring in the United States, so historian Chalmers Johnson wrote a review article for the London Review of Books. Johnson discusses the puzzle of Japan's unusually lenient treatment after World War Two, and comes to the conclusion that the Seagraves' ideas about the gold would explain a lot.

History and Prophecy

- Page 186 On the 10,000-year clock, see *Neal Stephenson and the 10,000-Year Clock* by Kevin Kelly (Blog entry at blog.longnow.org, 2 September 2008).
- Page 187 We should probably give Marc Bloch credit for the idea of the *Longue Durée* approach to history, but Fernand Braudel is nowadays a more familiar name. See for example: *Civilization and Capitalism, 15th–18th Century (in 3 volumes)* by Fernand Braudel (1979). For an even longer *longue durée* perspective on European civilisations, back nearly to the ice age, I also quite like *Europe Between the Oceans: 9000 BC to AD 1000* by Barry Cunliffe (2008).
- Page 187 For a good overview of the many theories of collapse, see *The Collapse of Complex Societies* by Joseph Tainter (Cambridge University Press, 1988). However, note that he doesn't distinguish between societies and civilisations (some of his examples of societies are civilisations and some aren't). See Quigley 1961 for a worthwhile definition of the difference.
- Page 187 The idea of “black swan” events — very rare, very disastrous and contrary to previous experience — is explained in *Fooled by Randomness: The Hidden Role of Chance in Life and in the Markets* by Nassim Taleb (2004).
- Page 187 Comments on elite mismanagement are from Tainter 1988, p72.
- Page 188 The catabolic collapse theory can be found in *How Civilizations Fall: A Theory of Catabolic Collapse* by John Michael Greer (Available online, 2005). For a more recent update and commentary see also *The Onset of Catabolic Collapse* by John Michael Greer (Blog entry at thearchdruidreport.blogspot.com, 19 January 2011). For “resource exhaustion” see *The Medieval Machine* by Jean Gimpel (1988), *A Green History of the World* by Clive Ponting (1992) and *Collapse* by Jared Diamond (2005). Tainter 1988 favours “complexity collapse” as a general explanation of collapse.
- Page 188 Quotes defining resources, capital and waste are from Greer 2005.
- Page 189 On software maintenance, see p115 ff of *Facts and Fallacies of Software Engineering* by Robert Glass (2003).

- Page 191 The figure of \$2.2T for infrastructure repairs is from *Infrastructure Report Card* by American Society of Civil Engineers (www.infrastructurereportcard.org, 2009).
- Page 191 For more on soil problems, see chapter 20 of *The Crash Course* by Chris Martenson (Wiley, 2011), and also *This Week's Finds (Week 314/315) interview with Thomas Fischbacher* by John Baez (Blog entry at math.ucr.edu/home/baez, 6 June 2011).
- Page 191 Start of catabolic collapse in 1974? See Greer, 2011.
- Page 191 Japanese dominate in “producer’s goods,” see *The Myth of Japan’s Lost Decades* by James Fallows and Eamonn Fingleton (The Atlantic Monthly, February 2011).
- Page 192 For overview of energy and peak oil, see Martenson 2011, chapters 15 and 16, and particularly p134 and p146. Note that two-thirds of US domestic oil production is used in agriculture, Martenson 2011, p140.
- Page 192 This is probably not the original source for the term “military Keynesianism,” but it’s certainly explained in *Republic or Empire: A National Intelligence Estimate on the United States* by Chalmers Johnston (Harper’s Magazine, January 2007).
- Page 193 United States permanently prepared for war, see *Imperial America: Reflections on the United States of Amnesia* by Gore Vidal (Nation Books, 2004).
- Page 193 The figure of \$2.3 trillion waste by DoD is from: *Rumsfeld cuts Pentagon red tape* (BBC News, 10 September 2001, available online).
- Page 194 On the problems of shareholder capitalism, see *The Failure of Shareholder Capitalism* by Michael Lind (Salon, 29 March 2011).
- Page 194 For a discussion of the transfer of money in USA from everyone else to the rich, see *Of the 1%, by the 1%, for the 1%* by Joseph E. Stiglitz (Vanity Fair, May 2011). See also: *The Trillion Dollar Income Shift* by Jack Rasmus (Online at www.kylosproductions.com, 11 March 2007). Also see Martenson 2011, which reproduces several economic graphs that change slope dramatically in 1980. For example, USA private debt goes from flat to a 5% increase per year (p72). The personal savings rate was steady at around 8% until 1980, but then dropped sharply, reaching nearly zero by 2000 (p117).
- Page 195 The Very Big Stupid quote is from: *The Real Frank Zappa* by Frank Zappa (1989).
- Page 195 “Unregulated greed” quote is from *The Big Things That Matter And The Little Things That Annoy* by Paul Craig Roberts (Online at www.vdare.com, 11 August 2010).
- Page 195 For a good summary of likely disasters, see *Global Catastrophes and Trends: The Next Fifty Years* by Vaclav Smil (MIT press, 2008).

- Page 196 On ultimate consequences of global warming, see *The Vanishing Face of Gaia: a Final Warning* by James Lovelock (Viking, 2009), but for a dissenting view, see also *Heretical Thoughts about Science and Society* by Freeman Dyson (Online at www.edge.org, 2007).
- Page 196 For a discussion of how “just in time” manufacturing across the world was disrupted by the 2011 Japanese tsunami, see *Japan’s Disaster and the Manufacturing Meltdown* by Marc Levinson (Foreign Affairs, 17 April 2011). On the contrast between the robust Soviet Union and the brittle USA, see *Reinventing Collapse: The Soviet Experience and American Prospects (revised edition)* by Dmitry Orlov (New Society Publishers, 2011).
- Page 196 For a good overview of energy alternatives, see *Sustainable Energy — Without the Hot Air* by David MacKay (UIT, 2008. Also online at www.withouthotair.com).
- Page 196 For an overview of the “travelling wave” reactor, which could run for 50 years without refueling, see *Bill Gates on energy: Innovating to zero!* by Bill Gates (Talk at TED Conference, Feb 2010).
- Page 197 The “greatest good lies in the future” quote is from Quigley 1961, p336.
- Page 198 For history of capitalism and its possible future in China, see *The Long Twentieth Century: Money, Power and the Origins of Our Time* by Giovanni Arrighi (Verso, 2009) and *Adam Smith in Beijing: Lineages of the 21st Century* by Giovanni Arrighi (Verso, 2009).
- Page 198 For a useful view inside the Chinese Communist Party, see *The Party: The Secret World of China’s Communist Rulers* by Richard McGregor (Allen Lane, 2010).