

Changing the Diabetes paradigm

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People are sick and dying from a poor diet, high in macro nutrients but deficient in micro nutrients, minerals, vitamins and phytonutrients. In the last eighty years the macro nutrients (sugars) in common fruit and vegetables has actually increased while the micro nutrients have decreased by a factor of thirty. This is the result of industrial-chemical farming.



Our bodies have the intelligence to sense this lack of micro-nutrients telling us we are hungry, even though we may be full, so we just eat more of this low nutrient food, get fatter and suffer from chronic diseases - such as diabetes - the major cause of blindness and amputations.

The standard first line of medical treatment for diabetes are drugs which increase insulin which may ameliorate the symptoms but ensure the patient will be diabetic for life when it is now well established that diabetes can be reversed by diet - maybe somewhat brutal but effective.

This works great for the profits in the mega corporations in the food, drug and supplement industries but is not good for the communities health. Neither is industrial-chemical farming good for the planet as it destroys the soil on which we all depend.

This requires a major paradigm change in not just what we eat, but how we grow our food and how we safeguard our communities by changing from purely 'for profit' to what benefits the community.

It is simply wrong that we should be jeopardising peoples health and our food supply and the food supply for our grandchildren so just a few very wealthy people can get even wealthier.

Here we look at how to bring about these major changes.

Changing the diabetes paradigm

The Blast

There is something seriously wrong with our health and food industry.

Over 1 in 3 of us are now affected by some sort of chronic disease - it never used to be this bad - we are suffering collateral damage from our foods - what we eat and how it is grown.

But the way we treat these chronic diseases is fundamentally flawed. Go to the doctor and the chances are that you will be prescribed medication which may treat the symptoms but not the cause. If you go home and Google that drug you will find a list of damaging side effects. Some drugs will make you worse not better in the long run.

Billions of humanoids over a million years have successfully survived because of their inbuilt sophisticated control system. We have simply screwed-up our control system by modern crappy food. We are suffering collateral damage from modern food.

The real solution is to unscrew-up our control system by eating healthy nutritious food - and that's easy - I show you how.

But instead of focusing on food as a first line of defence doctors prescribe drugs that may ameliorate the symptoms but aggravate the illness long term - this needs to change.

I am not a political activist - I have never been to a demonstration in my life but what I can do is lay out the hard facts in this little booklet which explains the technology.

In the time it takes you to read this booklet some twelve people will have had their legs amputated. Think on this - if you read this book fast then only ten people would have suffered amputation so you would have saved two people's legs. This is the Monty Pythonesque rubbish which pervades the world of epidemiological studies.

My life has been in science and technology - I can expose the wonky thinking and provide the technology which offers the solution.

It's up to you - the reader - to appreciate the need for change in the system - to tell your friends and contacts - tell them where they can read this little booklet for free and which will hopefully start the needed social revolution.

It's your health and it is up to you what you eat (unless your hobby is unsuccessful bank robberies) - it is up to you to make the needed change happen - it won't come from the food or drug industries, or the doctors of the Government the motivation has to start with you.

The essence

Here I am very focused on resolving diabetes - but food affects every bodies health, our modern food has too much energy whether from fat, sugar or a combination of both and a lack of the essential micro nutrients for health - empty calories. The solution for diabetes is a lesson for everyone.

At least 500 million people have a screwed up control system so there blood sugar is all over the place - too high and blocking blood vessels leading to blindness, amputations, and heart attacks and to early death - or too low leading to the brain shutting down and death.



This is the diabetes and obesity epidemic which is on a massive scale - we spend trillions of dollars and employ some of our brightest and most talented people trying to fix the symptoms with toxic pills and weird diets.

Right now we have the technology to reverse most people's diabetes and certainly to prevent people becoming diabetic.



Despite this technology the diabetes epidemic continues to increase at 4% p.a. it is getting worse rather than better.

Why are we going backwards? Because we focus on the symptoms and not the root cause which is because we have screwed up the control systems (the combination of our head and gut brains) which control our biochemistry. We need to focus on the real cause which is the effect of food stress on our control system.

For most people diabetes is not a disease like the black death (although it is on the same scale) - it is society inflicted collateral damage.

The first step is to repair this collateral damage.

The second is to protect against further damage.

The third stage is to look at changing society so this collateral damage does not occur again.

In **Part 1** I give an overview of the latest technology which can reverse diabetes.

Hundreds of doctors are now helping thousands of their patients to reverse their diabetes. There is no doubt that this technology is for real and works.

Reversing diabetes is a quick but rugged process which brings short term success but how do we stop them reverting back again and how do we protect people who are currently not diabetic but could easily be caught up in the diabetes avalanche. So we have to look at how to prevent diabetes in the first place by examining the root cause - food stress.

We need to explore two fundamental questions - why fifty years ago was diabetes extremely rare but it now fast approaching becoming the norm - and why, when people are apparently eating the same type of food, do some become diabetic while others seem immune.



If you are diagnosed with diabetes your doctor is unlikely to explain the already available technology which will reverse diabetes with you but is more likely to tell you that diabetes is not curable, is progressive (gets steadily worse), you will need stronger and stronger medications until you will need insulin injections and are likely to go blind, have your limbs amputated and to die young from a

heart attack.

It is well understood that an excess of insulin - the fat making hormone - is the result of a poor eating pattern and is the root cause of diabetes yet your doctor is unlikely to help you change your diet but will prescribe pills which will increase the insulin in your blood stream virtually guaranteeing you will never recover from diabetes.

Why - because the power of established paradigms.

The old paradigm says that diabetes is fundamentally a biochemistry problem - we store fat because we eat too much.

The solution is to reduce the amount we eat and take pills to control the symptom of high blood sugar.

The result is that we may burn fuel in the short term but in the long term we hoard fuel getting fat and diabetic. Our bodies learn there is a risk of fuel shortage so refuse to release fuel from our fat cells so we become insulin resistant and diabetic.

The new paradigm says that diabetes is fundamentally a control problem - we have an intelligent control system comprising our head and gut brains and the trillions of cells in our gut biota. This has immense self-learning capacity so we can call it our puppy.



The amount of sugar in our blood is very small about 5 grams - there can be ten times that in a single can of coke or a piece of cake - so to maintain our blood sugar level our control system - our puppy - must direct the sugar to

be stored in either short term storage like our liver or longer term storage like selected fat cells.



But our puppy is intelligent, learns and remembers. If at any time we have suffered food insecurity (real or imagined) it can turn into a ferocious guard dog and refuse to release the stored fat.

Our bodies need the normal macro foods - fats, sugars etc. which in modern society are in abundance.

It also needs a spectrum of micro nutrients like magnesium, vitamins and phytonutrients which should be in our modern food system can be deficient.

As historically these were widely available in our foods we have not evolved a mechanism to tell us which nutrient is missing so it just sends out hunger signals so we eat more which we store as fat which again the ferocious guard refuses to release.

Toxins also upset our gut biology and control system, many drugs inhibit the action of these micro nutrients so although we actually may have plenty in our body they just get stored in our fat cells and are not available to us - protected again by the ferocious guard dog.

We store fat because our control system senses it may is not be being properly fed. Result we may feel full but we are not satisfied - we suffer food stress.

We end up storing excess fat and become diabetic.

The solution is to retrain our intelligent control system - our puppy - by eating high nutrient meals on a regular basis so our bodies learn they will always have the right foods that it needs followed by a time where our bodies learn they can safely release fuel from our fat cells. We retrain our intelligent control system to store and release fuel.

There is a big difference between theory and practise when it comes to diet. I am a miserable failure - just getting hungry and attacking the cake bin - but I have had success with intermittent fasting. Now I just add lots of baby greens straight from my Gbiota beds to most of my meals so I always feel satisfied - seems to work for me.

My puppy needs to feel loved and fed - not starved into submission.

Part 2 is about how to create a paradigm change. There are two basic rules - the first is find the people who are really having problems from the old paradigm.



The second is to give a practical demonstration that the new paradigm actually works to solve their problem. It is no good giving pages of theoretical arguments - they want to see it work for themselves in the real world.

With diabetes the '**does it work**' test is simple - if people can cut their medication and still control their blood sugars - then it works.

Identifying the people who have a problem is equally easy - it is the people who have been diagnosed with diabetes and told they are at risk of going blind, having their legs chopped

of and dying young. If they don't see that they have a problem they have a forth problem - they are seriously stupid.

I hope that this is read by doctors, health administrators, politicians etc. but the people who are going to make this paradigm shift happen are the people with diabetes. I have therefore tried to use lay language rather than the technical terms - apologies.

Part 3 is the practical side - how do we make this happen

Making it happen

To make the paradigm shift we identify the group who are suffering - obviously the diabetics but they cannot make the change themselves and need the support of their doctors who can advise them of the technology and coach them through the change.

They also need ready access to the sort of food that will make them healthy.



Theoretical arguments rarely work in a paradigm shift - in reality we don't fully understand how our sophisticated self-learning control systems works - at least at the high level required for science to be taken as proven. But that should not stop us - kids learn to ride a bike with absolutely no understanding of self-correcting gyroscopic forces.

What is needed is a demonstration that it works.

This is not going to be achieved by some giant epidemiological trial but on a case by case basis which can be documented on the internet and hopefully go viral so all diabetics are aware of the options open to them.



This is the aim of the Gbiota club where members can undertake their own trials with support of the group and hopefully their doctor. They can grow some of their own food which will provide the essential biology, micro nutrients, vitamins and phytonutrients to make them healthy.

Wicking beds are a well-established technology enabling people to grow plants which will make them healthy at home - they can be very simple and cheap - for example - be made from a scrap old bath.

Gbiota beds are suitable for larger scale growing and can be used for home growing in larger gardens or more importantly for commercial growing so people can go and buy the food which will make them healthy.

Gbiota beds are a growing system primarily for small fruit and vegetables where plants can be grown which will reinforce gut biology - a key component in our intelligent control system - grow food free of toxic chemicals which may harm the gut biology and provide minerals, trace elements and phytonutrients which are generally low in modern industrial chemical farming.

The Gbiota club is a group of people whose aim is to develop and prove the technology of growing plants which will make people healthy. It is global with people sharing information on the internet. All are welcome to join contact <mailto:colinaustin@bigpond.com>

Part 4 is a list of useful references

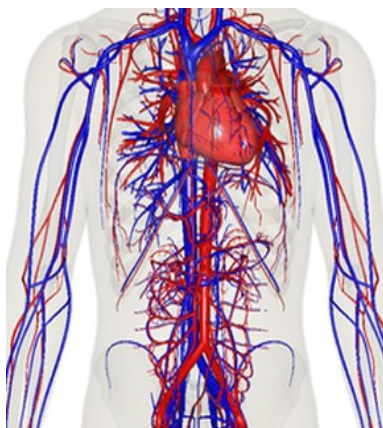
Part 1 the technology for reversing diabetes

This is not a manual for reversing diabetes - there is a mass of detailed information on my web site www.waterright.com.au which is primarily focused on how to grow food which will make people healthy. I have given links to the scientist and doctors who are making this technology happen. They can explain the underlying complex biochemistry far better and with far more authority than I can.

But these are specialists in their field and sometimes it helps to step back and take a holistic appreciation of the technology and look at the problems from a different viewpoint.

This is my approach looking at diabetes from the viewpoints of engineering - explaining how control systems work, from computers and artificial intelligence, from epi - genetics and evolution, from regenerative agriculture and most important the viewpoint of an ordinary person who has just been diagnosed with diabetes and is wondering what on earth to do next.

Diabetes from the viewpoint of a control engineer



The facts are simple - the amount of sugar in your blood is tiny about 5 grams (a tea spoonful), and is in dynamic equilibrium - meaning that it is not the same sugar all the time.

New sugar is continuously entering your blood in a series of waves through the gut wall from your stomach.

Some sugar is continuously leaving your blood to power your muscles and brain.

Other sugar is temporarily stored in your muscles, liver and other organs, the amount in this temporary storage - at 200 grams - is some 40 times the amount of sugar circulating in your blood.

But this is still tiny in comparison with the amount in longer term storage in your fat cells which could be some 20Kg or 4,000 times the sugar circulating in your blood.

Your body maintains the blood sugar within very tight limits, if it gets too low there is not enough energy to fuel your brain - and you die. If it gets too high it blocks off all those little pipes such as those that feed your eyes, limbs and heart and you go blind, your body rots from the excess sugar and you and die from a heart attack.

The fact that it works at all is simply amazing - the fact that it is currently working fine for some 7 billion people and has been doing so for a few millions years is simply stunning.

Evolution has done an incredible job in developing what could be the world's most sophisticated control system - and we have screwed it up and think we can replace it by weighing the amount of food we eat - just delusional.

The evolution of hormones

Over millions of years we have evolved a highly sophisticated system of hormones, nerves and an intelligent controller which resides in our head and stomach which maintains the blood sugar within these fine limits.

Very clever and dedicated scientists have been studying these hormones and have identified some twenty different hormones which control sugar entering the blood and a similar number which control sugar leaving the blood stream - it's a complex system.

The stunning intelligent control system

But nothing compared with the intelligent control system which manages the process.



complex system.

In our head brain we have billions of cells, some providing conscious thought - many more sub-conscious and automatic while in our guts we have trillions of cells, of a variety of species of bacteria, fungi and more which are communicating with each other working like a super computer to manufacture and manage this mind blowing

The reality is that we have very little understanding of how this complex intelligent control system works - but it does - and extraordinarily well.

For millions of years and for billions of people humans have been going about their daily lives with barely a thought for this sophisticated control system which is keeping them alive.

We can't know everything about everything - and it doesn't matter

Does it matter that we don't have the in depth understanding we would like?



Reflect on this - kids learn to ride a bicycle when they are about four years old - by the time they are ten they are performing the most spectacular stunts at the BMX tracks.

Have they any understanding of the physics and gyroscopic forces which makes this possible? No.

I had been riding bikes for years before I went to University and learned about gyroscopic forces and how when you try and change the direction of rotation of a spinning wheel you created a twisting force at right angles to the direction of rotation. This twisting force means you automatically steer into the direction you are falling and so automatically balance.

I had not thought deeply about why the forks on my bike was at a slight angle and the spindle of the front wheel was set slightly ahead of the line of the forks.

Now I understood how a bicycle actually worked. Before that all I understood was that you had to be moving to stay up and that if you wanted to turn right you lean to the right and lean to the left to turn left.

When I cycled back to my digs did this new found knowledge help me in any way? No.

With diabetes do I (or anyone) really understand how our intelligent control system works? No.

Can we still restore our health? Yes.

We have screwed up our control system

But I do know that it does work and with great stupidity we have screwed it up.

The sensible response is to fix the screwed up control system.

This book is about how we have screwed up our intelligent control system and what we need to do to fix it and that requires a paradigm shift in the medical profession, our food production system and above all people suffering from diabetes.

The medical profession or the food industry cannot reverse one single case of diabetes by pills - that has to be done by the diabetic changing what they eat (or draconian surgery). Exercise and stress reduction play a part in diabetes reversal but changing food is the biggy.

How to think about how our control system works

I wish I could describe how our intelligent control system actually works - but neither I nor anyone else really understands it. All we can do is marvel at its sophistication.

It takes upside down pixels from our eyes - turns it into pictures we understand and then allow us to do incredible things like drinking a cup of coffee while walking up a set of crowded stairs without spilling our coffee or bumping into the other people - easy for us but almost impossible for a robot designer.

It controls our heart beat so the blood flow matches our needs and our breathing and we don't even think about it. It also regulates the supply of fuel to our muscles and normally the amount of food we eat so we don't end up as skeletons or balloons.

Sometimes it gets it wrong and we end up fat or diabetic and we think we can fix it by manually regulating our diets - but if our control system has decided we are going to be fat then we end up fat - regardless. We spend billions on slimming diets proving this over and over again.



We can imagine there is a smart little puppy inside us

If we are going to reverse diabetes we have to convince that little puppy inside us - that we call our intelligent control system - to tell our hormone system to stop pumping us full of the fat making hormone - insulin.

I say puppy because reversing diabetes is pretty much like training a puppy.

How human designed control systems work

When it gets out of kilter we have to fix our control system and to do that we have to make an effort to understand how it works.



When I was a kid I used to take things to bits to find out how they worked - good fun. Sometimes (=often) I could not put them back together and had to hide the bits under my bed. (They always found them grrr). I feel a bit like that now.

We probably never will fully understand how this control system works but at least we can start by learning about our man made intelligent control systems and how they work.

Humans have been designing automated control systems for years - they are based on the laws of physics and we know exactly how they work.

Our bodies use exactly the same laws of physics (they are universal laws) as our man made control systems - the difference is in the much higher level of intelligence and self-learning capabilities in our bodies.

How mechanical control systems work

But I know how mechanical control systems work (that was my job - I am an engineer) so I need to explain the key parts.

In a mechanical system the first thing we need is some form of open - close device - like a valve - which can open or shut progressively to let a bit more or less fuel into the engine.

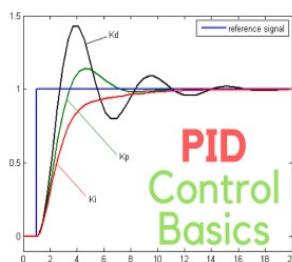
The second thing we need is some sensor to measure what is going on so we know if we are supplying too much or too little fuel.

And the last thing we need is often the most complex - an intelligent control system that can take decisions. At one extreme this could be a simple on off switch - but that is not much use for anything more complicated than a hot water tank.

Modern controllers can be highly sophisticated with artificial intelligence or more accurately self-learning systems which actually learns the characteristics of the system to give very precise and smooth control (a good example is self-driving cars).

I used to write what people call artificial intelligence software or what I prefer to call self-learning software. They barely rank against the self-learning ability of the human intelligence system

Practical example



So let's start by imagining an air conditioned building with the temperature set to 20°C with a modern PID controller. (PID stands for Proportional, Integral and Derivative which are the basic components of a control system).

The temperature is running at a steady 20°C when someone outside drives up and opens the door letting a rush of 40°C air in from outside.

The first bit of the control system to start to work is the derivative function which looks at **changes** in temperature - say by recording the change in temperature every 6 seconds.

If the temperature is rising at 1°C per minute it will sense a 0.1°C rise in that first 6 seconds and will immediately responds by turning up the air conditioning power. It does no wait for a

significant error to occur - it senses the rate of change of error and acts nearly instantaneously.

Our bodies are very good at reacting to changes - we learned that when we caught our first ball. It is often called anticipatory control - we don't catch a ball by simply looking at where it is now but by how fast and in what direction it is moving then putting our hand where we anticipate it will be shortly.

Pretty smart - ever seen a robo-cricket player?

This will mean that the temperature will only rise a negligible amount before the door is shut and the temperature steadies.

But because there is an extra body in the room there is a higher heat load so the temperature does not drop back to the exact set point but will be higher (offset).

Then the proportional control will start to work gradually bringing the temperature back to nearer the set point - but with an extra body in the room it will never quite make it.

Proportion control only works when there is an error so the temperature will settle out to a steady value just a bit above the set point.

Our brain instinctively understands proportional control - it is so obvious. If a stuck draw won't open - pull harder.

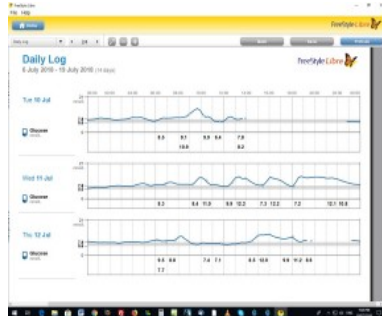
This is when the integral function starts to work by seeing that minute after minute the temperature is above set point - so it will slowly step up power to the air conditioning unit and will keep on doing this until the set point is reached.

If you looked at a graph from a typical controller in action you would see that it is continuously trying to pull the actual temperature back to set point.

I have watched this many times as a controller will fight to bring the system back to set point.

Again our bodies understand integral control - at first sitting on a hard seat is acceptable but over time it becomes painful so an adjustment is needed - we wriggle.

I see exactly the same form of graph from a continuous blood sugar monitor; if it starts to go out of control you can see the body trying to correct the error.



The graph shown is actually from my wife - Xiulan and you can see that most of the time the body is correcting deviations from set point without any real difficulty - then you see a spike - it is totally out of control. This is actually caused by a cortisol spike when she got hungry and her body went into emergency mode - food stress.

Our bodies have a fully functional PID controller - but they are just much smarter with built in **self-learning** capabilities.

Engineering and human control systems

Our bodies - as an energy system are pretty much what an engineer faces every day.

At some point our muscles are going to need more energy, we can store a little energy in the muscles just like a carburettor can store a small amount of energy for immediate use.

But the amount of fuel will only last for a short burst so we need a pump (the heart) to transport fuel from the fuel tank (stomach) to the engine (muscles).

If we come to a flight of stairs the fuel in the carburettor may get us up the first few steps but to get up the full flight we need a big whoosh of fuel, and when we get to the top we need to turn off that big whoosh of fuel so we don't turn into the bodily equivalent of a marshmallow.

Our human control system - like an engineering control system - needs to have a sensor in the muscles so we know how much fuel is immediately available, how much fuel is in the blood stream and how much fuel is in the stomach.

There doesn't seem much in the literature about bodily sensors. I read that the leptin (full) hormone is switched on by the tension in the stomach wall. That can't be true - I can eat a decent meal until I feel full but can always find room for a bit more cheese cake - even if the tension in my stomach wall is like a violin string but if I eat a few nuts I immediately feel full even when my stomach is only partially full.

I usually finish my meals with a few nuts of chocolate and my control system has learned that this is the signal that eating time is over. I am training my puppy.

Leptin and our control system works on a far smarter sensor than stomach tension.

The engineer would need a pretty sophisticated computer as a control system - if the eyes detect a less than friendly bear he wants the controller to start pumping emergency fuel to the muscles for a quick departure.

However, if the bear turned out to be a friendly neighbour showing off a new coat he would want the system to shut down quickly to avoid flooding the engine e.g. a controlled insulin resistance.

In the human body the control signals appear to be largely hormonal so to undertake the required trouble shooting we would want measurements of the hormones - but next we would want to see how the computerised control system is working.

I will soon argue that this weakness in the control system is at the core of diabetes - but let us review.

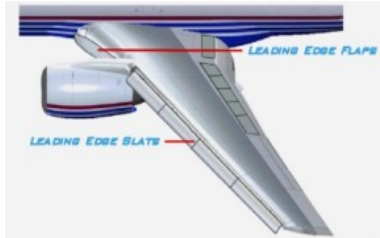
The three components of a control system

Control systems - both engineering and biological - have three main parts.

The first part is the bit that actually moves and does the work. In engineering this could be an actuator e.g. a hydraulic or pneumatic ram, some flap may be driven by an electric motor.

In the human body there is an equivalent mechanism that regulates the flow of sugar from the blood and into the muscles and organs.

Our job here is to look into the wonders of biochemistry to work out how it works - and it's an interesting story.



The second is the sensor which measures temperature, position or whatever. Sugar levels is just one of the things we need to measure to control our dietary system.

The third is the logic unit which decides what needs to be done - nowadays typically a dedicated micro-processor or a programmable computer with the logic built into the software.

We can see this clearly from how a modern aircraft maintains stability in flight. A gyroscope detects any change in angle - say from turbulence. This signal is then sent to a computer which works out whether the plane is pitching or yawing and decides what combination of flaps need to be moved. These instructions are then sent to the hydraulic system to actually move the flaps.

Let's have a look at what information is available on these three parts for controlling diabetes in the biological system.

Looking at the right problem - going on a journey

If we are simply focused on balancing the average amount of food we eat against our average energy use over a journey we are looking at the wrong problem.

Returning to our car journey we see how the fuel load or energy requirements are continuously varying.

We go to pull away from standing and we need a lot of energy to get the car up to speed. There may be a little bit of fuel in the carburettor or nowadays fuel injection system but it is nowhere near enough so the fuel system in the car starts to pump fuel into the carburettor or injectors at a high rate.

But this is not some uncontrolled pumping - there will be a sensor (often in the exhaust system sensing oxygen) measuring if the right amount of fuel is being delivered.

The energy demands are continuously varying - a car needs a lot of fuel when pulling away or climbing a hill and very little when coasting down a hill.

In a car there is a sophisticated control system which in real time (e.g. as needed) supplies just the right amount of fuel for what is needed right then.

Our bodies work in exactly the same way - regulating the amount of fuel which it takes from our fuel tanks (liver, tummy and fat deposits) and supplies it to the muscles to turn into energy - again in real time - that's important.

Diabetes is when this fuel control system stops working properly.

If there is a problem with the fuel system in the car we fix the fuel system - we don't try and control the cars speed by how much fuel we put in the tank.

Similarly, if there is a problem with our bodily fuel system (we have diabetes) we need to fix the fuel system and not try not try and adjust how much food we eat (as some dietitians will have you believe). Our bodies have a separate built in system which should regulate how much food we eat and how much fuel is supplied to our muscles.

If our control system is not working properly we need to fix it so our intelligent control system tells us how much food we should eat - not try and adjust the amount of food we eat by manually estimating energy uses and weighing our food to supply just that amount of energy.

Apart from being silly it just does not work.

If we are going to fix our fuel system we should try and understand how it works - but our fuel system is pretty complicated and no one really understands fully how it works - that's why doctors have such a hard time in reversing diabetes.

Self-learning software



Self-driving cars are a classic example of self-learning or adaptive control. It would be simply impossible for a programmer to sit at a terminal and write code for every eventuality.



Instead they write code which examines everything they think could possibly be relevant in the surrounds then they take the car out on real roads with a manual driver and let the computer learn how to drive - just like we did.



Of course they get it wrong sometimes but we went through exactly the same process of learning by trial and error when we were kids - it's part of growing up.

Kids are always falling off their bikes and hurting themselves - that's how they learn to ride a bike. They don't sit down and study gyroscopic forces.

We learn to eat and control our bodies in exactly the same process.

Back to our temperature model we can make up a list of things that just may affect the temperature - time of day and cloud cover are the obvious one, but we may also look at a video camera out front and check for arriving vehicles or people.

We now write up a little computer program which simply looks at all the data coming in and see if it correlates with temperature fluctuation a bit later. Sure enough it sees that there is a temperature spike just after a car arrives so for a start the code makes a small correction to allow for this. Over time it adjusts the correction until it has something that is working really well.

Software which simply scans a mass of data looking for connections - cause and effect - which can be built into control systems is now common (data mining).

Another technique - which actually mimics the evolutionary process - is to introduce small variations or wobbles into the system. If when the wobble goes one way and improves the situation then this is incorporated into system - otherwise discarded. This is called fuzzy logic and has been around consciously in the programming world for a few decades and unconsciously in nature for a few million years.

Evolution works in exactly the same way - we reproduce sexually to introduce a wobble and that is why there will always be some people who are totally resistant to diabetes and others who will never be cured. Tough but evolution is a tough business.

What we program is not real intelligence - everything has been programmed in beforehand so it is often called artificial intelligence - I prefer self-learning. Humans do it much better - we are adaptable which means we can adjust - we survive from the hot tropics to frozen ice sheets. No other creature is so adaptable - that's why there are so many of us.

Our bodies do this all the time without us thinking - that how we drive cars - by looking to see if we have wobbled of course then correcting with varying degrees of severity.

Our current model of diabetes is purely a mechanical system - or more correctly a biochemical model. That is not wrong - that explains exactly what our bodies are doing but is only part of the story. We need to add to the story by thinking about intelligent control - trying to think about how our bodies work by using our knowledge of artificial intelligence - even though it is still a long way from our human intelligence.

This ability of self-learning seems particularly important for diabetics - with the intelligent system learning to associate certain foods or other signals with fuel load which triggers the release of the controlling hormones making people diabetic when there is no apparent physical reason.

Self-learning (artificial intelligence)

We learned all about PID controllers when we first started to suck milk from our mum's breasts - we didn't appreciate what we learned then and we apply this knowledge now without even realising we are doing it.

Our bodies have highly sophisticated learning capabilities - if one day it learns that eating too many onions causes tummy ache then the next time you get a bit heavy handed with the onions at the barbecue your mouth will (at least figuratively) snap shut.

Our bodies are smart

One of the really big mistakes that the medical profession has made in combating diabetes is to treat our tummies as some dumb system. It happens to be real smart - much smarter than a super computer.

So learning about mechanical control systems may be a good start but the human body is much more complex.

But it gets worse. In a mechanical control system we can normally expect the fuel to be uniform - but not the human body. The primary fuel we burn is glucose with maybe a bit of ketone for backup (and even that is not right because it's our mitochondria that create stuff with a long name - adenosine triphosphate ATP, which is actually what we burn for fuel). This is very different to what we eat - so our body has to convert our food into an available energy source. And we all do that in different ways.

Our crude thermodynamic system

Let's just review the bits of our crude thermodynamic system.

We have our control system made up of our brain and guts which really run the show, they receive signals either as nervous signals or hormones, communicate with each other to decide what action to take then send out more signals either as nervous or hormonal signals to instruct the body what to do.



We have our 'refinery' which receives instructions from the control system to take in a whole range of different foods (whatever is available) and processes this food to convert it to usable fuel. This fuel is then stored, in the stomach, blood and fats cells for short or long term use. Again the intelligent control system decides how much food and what type of food to take in, where and how much should be stored and when the fuel should be released to the engine to provide power.

This refinery is a pretty versatile department as humans across the globe take in an enormous range of foods from almost totally vegetarian to totally meat and fish and an almost infinite combination in between and somehow seem not just to manage but generally thrive.

Then we have our engines (muscles) which take the fuel and convert this to power (movement) both internal (e.g. brain and heart) and external (e.g. legs and arms) which enable us to do things.

Our intelligent system can also cause our bodies to expel excess fuel in our poop and pee which totally blows away the calories in and calories out theory. Mankind has been pigging out and starving for a million years and evolution has given us a very effective system for managing the variability of our food supply (but maybe not resistance to high pressure advertising).

There is also the maintenance division which is busy replacing parts of our body as they wear out or are damaged. When can I buy a car that automatically replaces its brake pads?

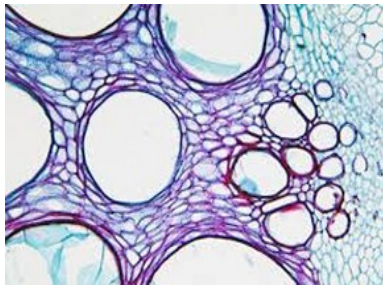
This is a pretty crude model which provides the thermodynamic core of our bodies (which must still obey the laws of thermodynamics and machines) so now we have to make this more realistic by incorporating what makes us a living system.

Just how smart is our blood sugar control

In a car the amount of fuel in the pipes, carburettor or fuel injection system is very small - just enough to move the car a few metres.

Our bodies are very similar. We need between 0.8 and 1.1 grams of glucose per litre of blood, there are some 5 litres of blood in the body so the total amount of glucose circulating is only 4 to 5.5 grams - that's about a tea spoonful - incredibly small.

Our control system manages to maintain the blood sugar levels within a very tight range with this very small buffer. If it drops just a little below the set point our brain runs out of fuel and stops working - which means we die (quickly) and if it goes just a little above we clog up the pipes and die (slowly).



As far as I understand (and biochemists don't seem to write much about this spectacular feat of engineering) this is achieved by our hormones - primarily the pancreas releasing glycogen to release fuel - initially from the liver but later our fat stores and insulin to release fuel into our muscles and organs.

This is an incredible feat of engineering. It works by having the basic proportion, derivative and integral functions which are basic laws of physics which we understand from industrial process controllers - but also from an amazing system of self-learning (RI) Real Intelligence which we have learned starting from the moment we discovered that our mums breasts were a good source of fuel - and we will still be developing when we run out of breath climbing the last flight of stairs and drop down dead.

Filling a car tank and leptin

Going back to our car analogy - if a car uses 10 litres per 100k and you go on a journey of 100k you will need to put in exactly 10 litres (in theory). That's not quite right - it will be **about** 10 litres depending on many things like traffic density - just making a point.

Using a similar logic you may be told by a dietitian that if your body burns up a certain amount of energy that you need to manage how much you eat to balance the energy that you have burned.



If you don't you will put on fat which will block insulin and you will be diabetic.

There is only one way to describe this - total rubbish.

It is just not the way thermodynamic machines or human bodies work in the real world.

All thermodynamic machines have some level of intelligence built in - our bodies have far more.

If we try and put more fuel into the car than the tank can hold the filler in the pump will sense the tank is full and automatically stop putting any more fuel into the tank so it does not overflow - a pretty primitive form of intelligence but a basic level of decision making.

Our intelligent system at work

Our bodies have a far greater level of intelligence. Anyone who wants to really understand diabetes will soon find themselves immersed in the wonderful world of biochemistry and is likely to be bowled over by the level of sophistication.

It can tell us with incredible sophistication **what** and how the body is doing (but not the all-important **why**).

If we get hungry a hormone called ghrelin will tell us that we need to eat (just like the warning light on my fuel gauge).

As we eat a hormone called peptide Y should tell us we are full and stop eating. It works a bit slow and we can override it when we see that last piece of cheese cake so we have a tendency to overeat.

If we are overeating regularly another hormone called leptin can give us a bit of a lecture and finger waggle and say we are overeating so cut down a bit on the food.

We have all these hormones telling us that various bits of our bodies are full or empty.

We even have an emergency system so when we are being chased by the proverbial bear our bodies switch into emergency mode so the rest of the body shuts down and all energy is available for running as fast as possible. These should be called the flashing blue light hormones but are called adrenaline and cortisol.

If you read a bit more biochemistry you will find out that there are over twenty hormones whose job is to tell us when we are full and stop eating and a similar number to tell us to eat.

It is a complex and confusing business.

Leptin should tell us our fuel tank (fat stores) are full so we stop eating and if for some reason we carry on eating we are told that we will accumulate fat which will block the insulin which is the hormone which tells our bodies to store more energy - at first into our temporary store - our muscles and organs - then later our bodies will convert the sugar to fat and store this fat in our long term fat storage.

If our leptin signals are not working then we will keep on eating and get fat - this is leptin resistance which may make us fat but will not automatically make us diabetic.

I have observed many people who are leptin resistant and are fat but they are not necessarily diabetic.

Ancient and modern theories on how insulin really works

If you want to study this in depth then see further reading at the end.



The old fashioned explanation - which although outdated is what you are likely to be told by the doctor - is that diabetes is caused by fat blocking insulin - often the comparison is made with chewing gum blocking up a key hole. We now know that this is not the way it works at all.

Apart from not being true it gives us no clues on how to reverse lack of insulin sensitivity (unless there is a chewing gum solvent).

When I first came upon the modern explanation it was like being hit between the eyes because it made how to reverse insulin sensitivity blindingly obvious (in theory).

The modern theory - which you can read about from authorities in the field in the further reading - is that the sugar in the blood stream is made up from molecules which are simply too large to pass through the cells walls.

However what insulin does is to chop up these large molecules into their components parts which are then small enough to pass through the cell walls.

When they get inside the cell they automatically reform as the chopped up bits are chemically unstable (they get lonely and want to cuddle).

Here comes the important bit; - they are too big to get out and need yet another hormone to chop them up again so they can get out of the cell and re-enter the blood stream. It needs our puppy to tell the hormones to let the fuel get out of the cell.

If the ferocious guard dog is in charge there is no message and the fuel just stays there.

Obese people may lack this hormone signalling to let the fuel back out or for some reason the control system says hang onto that fuel - we may need it later.

This is important - putting fuel into the cells is a perfectly normal body function which works pretty well in most people. Getting the fuel out seems to be the big cause of the problem. It seems people don't get fat because they put too much fuel into their cells but the guard dog (brain) stops it coming out.

The cells keep on filling up until the cell is full - then no more fuel can enter the cell so you are insulin resistant and diabetic.

All very neat and a larger version would make a good Victorian conjuring trick.

Reversing diabetes and the ferocious guard dog

But the key point is that insulin resistance is caused by the cells simply getting full and not because of some weird chewing gum blocking the entrance to the cell.

The logic from this model is that all you have to do to reverse insulin resistance (and hence diabetes) is to burn off some of the excess fuel in the cells - sounds great in theory.



The snag (and there usually is a snag to ideas which sound so easy) is that nice little friendly puppy in our tummy which is our control intelligence has turned into a ferocious guard dog and he doesn't want us burning up all that energy he is dutifully guarding to keep us alive.

And this is the guard dog which stops millions of people from being able to keep weight off after a slimming diet. This big guard dog refusing to let fat out of our cells could be one of the big issues with diabetes.

Our two control systems

There are two control system working 24-7. Actually there are hundreds of control systems managing our bodies but for now we are just interested in two.

The first control system is fast acting ensuring the blood sugar remains in its tight control zone. The amount of sugar that can be stored in the blood is extremely small (5 grams) so this has to be a very fast acting control system with sugar entering the blood stream from the stomach in a series of waves while the demand for sugar by the muscles, organs and brain can also vary widely.

With sugar entering the blood stream from the stomach and some being burned up there will be a net imbalance with time with either a surplus or deficit.

The engineering problem is that our blood stream can only hold a few grams of sugar so the body needs some way of temporarily moving sugar into and out of a temporary store to maintain a balance.

So we have evolved to have rapid response hormones which can direct sugar into or out of the temporary storage in our muscles, liver and organs. Glucagon and insulin produced in the pancreas are key hormones but many more are involved to manage the extreme variation in load.

These hormones need to be extremely fast acting - seconds in the case of the proverbial ferocious bear and minutes when the blue lights aren't flashing and that naughty ice cream is flooding our blood with excess sugar.

We also have our fats cells which act as long term storage for the day when there is no food - good for our ancestors - not so good for us.

The second control system is much slower acting and aims to regulate the amount of food we eat so there is enough fuel to meet our energy requirements on average (with some balance being maintained by what we poop or pee out).

Peptide Y and Leptin sensing full and ghrelin sensing hungry are the main hormones. Other hormones are also involved but the self-learning capabilities can play a major role leading to over or under eating.

In our car analogy the blood is equivalent to the fuel in the pipe line and contains very little fuel, the short term storage is equivalent to the fuel in the carburettor or fuel injector system while the fat cells are equivalent to the fuel tank.

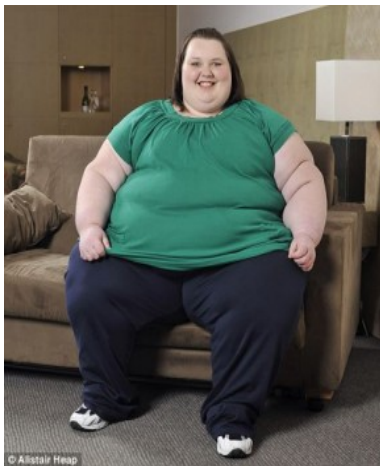
Our stomach is equivalent to an on board oil refinery.

Our bodies will always use the short term storage for storing or accessing fuel and will leave the fat storage untouched while there is fuel or capacity in the short term storage.

If there is a continuous over supply of fuel the body will first fill the short term storage (quickly) and then fill the long term fat storage (slowly).

A fat cell can keep on expanding up to twenty times its original size (meaning an increase in volume of 8,000 times - pretty big) but when it reaches this size it cannot absorb any more fuel and can be classified as insulin resistance.

Epigenetics at work



In the real world there are always situations which 'test' even the best of theories. One of these situations is why some people can be horrendously fat and are not diabetic while other slimmer people are diabetic.

This is where we have to delve into genetics. Some people are born with very limited fat storage capacity and others much larger. Not all our cells are available for use as storage system - it varies from person to person and also between sexes. Men tend to have storage high in their tummies flopping over their belts while women store the fat lower down in their tummies and on their bums and

thighs.

There is a difference between races - for example Asian people are typically slim and have small storage capacity so are very prone to diabetes.

Western people tend to have much larger fat storage capacity - you don't have to be a doctor to see this - just go to the local supermarket.

But epigenetics also play a role. The classic theory is that we are all born with a certain number of fat cells and we cannot make any more - so when they are full we are diabetic.

But one current theory is that some people have the ability to produce more fat cells by epigenetics (change of genetic expression by the environment). So these lucky or unlucky people - depending on your viewpoint - have the capability of become very fat with no trace of diabetics.

People who do not have the ability to make more fat cells are prone to becoming diabetic; if they can make more fat cells they can become enormously fat but will not become diabetic.

This theory explains why some fat people become diabetic while others don't.

Genetics, epigenetics and our gut biology

Our bodies evolved over many millions of years - they were not designed although they are so sophisticated it seems they were - so we must look at evolution and genetics.

At one time it was thought that understanding our genetic make-up would solve many health problems. But it turned out that superficially we have a very poor genetic make-up (about the same number of genes as a fruit fly - not impressive).

But then it turned out that our genes were more of an alphabet which could be used to make an amazing variety of options so we are confused by the baffling subject of epigenetics.

And if that was not bad enough our gut biology is far more genetically diverse than ours is - and can change within minutes which just confuses the matter further as our gut biology is at the heart (actually tummy) of our control system.

I make an optimistic attempt to discuss these complexities from the view point of evolution which helps us understand why we are the way we are - but the truth is the whole issue is so complex we really have little chance of building a complete model of how our control system really works - at least from a classic scientific viewpoint. So can we create a solution?

Engineers are used to working and making things happen in a state of ignorance. There is an ancient saying (dating back at least 5 minutes to when I made it up) that science is the art of managing truth, engineering is the art of managing ignorance.

Diabetes and evolution

Let's look at diabetes from the standpoint of evolution. We have been evolving on this earth as some form of humanoid creature for millions of years and certainly in human form for a few hundred thousand.

Evolution is a particularly effective way of developing creatures - it appears to be more than a simple question of trial and error with a new genetic composition at each new generation as proposed in Darwin's classic theory of selection of the fittest.



Many evolutionists find it is difficult to imagine that a complex capability like eye sight could be developed by this purely random inter generational change and hypothesise a capability such as a heat sensitive area which could progressively develop within a generation and they argue that these developments could be passed on genetically to the next generation.

Evolution is a bit more complex than measuring the length of finches bills on Galapagos Islands.

This is highly contested but is a debate for another day. All we need to note is that the process of evolution is highly effective at producing amazing capabilities like eye sight and other spectacular developments.

Man-made stuff up not genetics

So if we find - as we do - that a significant proportion of humanity is suddenly turning diabetic then we can be pretty sure that it is **NOT** some fundamental defect in our bodies which have been refined over millennia - but there is another basic cause.

For the sake of correctness I should point out that humans are a varied bunch with most people lying within a band we call normal - there are still a few people who lie outside this normal band - what statisticians - like to call the tails (from the Gaussian distribution graph). Some of these people may have a genetic abnormality which makes them genetically prone to diabetes. I am talking about normal people (within 3σ) so there is no need to send me an abusive emails saying I don't know what I am talking about and all this is rubbish.

The diabetes explosion can be traced back to its start some fifty years ago but it is just in the last twenty years that it has really taken off.

Twenty years is far too short for any genetic change (although the science of epi-genetics says that the environmental changes could be leading to a shift in gene expression).

But whichever way we look the inescapable solution is that the diabetes explosion is man made.

We need to ferret out how we have managed to stuff things up so spectacularly.

Our simple model

In Part 2 I will talk about the importance of having a model (or theory). Insulin resistance is caused by our long term storage filling up so there is no more room to store any more fuel.

(Fuel starts off as sugar and is converted to fat for long term storage).

We can reverse diabetes by burning off some of this fuel to make more room but this is not so easy because our intelligent control system (our internal puppy now ferocious guard dog) is carefully guarding these fuel stores.

That's our model - now we have to test this model to see if it works in the real world and our test is simple - can diabetics cut (or seriously reduce) their medications and still control their blood sugar

This is a dead easy test, just one quick prick - now we have to see what evidence there is to support this model.

Testing the model



I will be talking in Part 2 about Dr Google but for now just try typing 'case histories of people who have reversed diabetes' into YouTube (YouTube has pictures of real people). Ignore all those that try and sell you something and focus on genuine case histories.

They fall into several groups who seem to be at war with each other.

There are the ; -

- low fat group who think the low carb group are idiots.
- low carb group who think the low fat group are idiots.
- fruit and veg group who think that that everyone else is idiots.
- shake gulpers who think they are the only scientific ones and go to the toilet a lot.
- intermittent fasting group who can't understand what the fighting is all about - just do a bit of fasting.

Actually this pseudo battle is a bit like a Monty Python sketch. Modern food has too much fuel or energy, whether from sugar, from fat or a combination of both. It does not matter a stuff how you get rid of it as long as you do. The real issue is the lack of the micro nutrients essential for health which makes our puppy hungry so we keep on eating (more and more - been there done that).

You will find a few individual who have reversed their diabetes by themselves without medical supervision. It is pretty clear that these are a seriously tough breed and have managed to overcome the internal guard dog by sheer will power.

The others have a supervising doctor from one of the competing camps who have kept the internal guard dog at bay.

But the unavoidable conclusion is that there are thousands of people who have reversed their diabetes by keeping their internal puppy on its lead and burning off excess fuel. It does not seem to matter how they burn of the fuel as long as it gets burned off.

They are likely to need the help of their doctor in overcoming the intelligent puppy and who will help them reduce their medications to avoid hypos.

I am not offering advice on this first stage of diabetes reversal, only to say suggest that you keep on hunting until you find a doctor who is tuned into this approach. They are difficult to find but they are out there.

If your luck is out you will end up with a doctor who will prescribe pills which will increase insulin - guaranteeing you will never recover from your diabetes.

That happened to us, we asked Dr. Google what the side effects of these pills were and we saw scientific studies saying they increase the risk of heart attack three times we simply said - no way - we will do it by diet.

This is the stark reality we faced.

Genetic variability

There are a few little puzzles to sort out - why is it that when people lose weight they do not do it uniformly over the body with some areas being totally resistant to weight loss while fat drop off easily in other area. It is as though our bodies only use part of our fat reserves for control.



I can only put this down to genetic variability but that's what evolution is all about. We have sex for reproduction (with often significant attraction to people who are very different - look at the number of interracial marriages). Evolution works on variability.

(

(That's not me and Xiulan in the picture - just another

random couple.)

But we can be as sure as anything in this world - that diabetes can be reversed in most cases simply by emptying up our fats storages.

Obviously this only applies to type 2 diabetics who have functioning Beta cells but remember that Beta cells can stop producing insulin because they are blocked by fat and can become functional again when the fat is removed. (Google Roy Taylor)

There are also some people who are so genetically disposed to diabetes there is no way of reversing their diabetes.

Cruel business this evolution and natural selection!

We only have to look back in history to see that in practise very few people suffer this genetic disposition, the vast majority of diabetics are the result of collateral damage from modern living.

Diet and epidemiological studies

The fat v carbs battle has been going on for decades - aggravated by epidemiological studies with dubious statistics and not much believable science.

We know that historically climate has cycled with extended periods of many years when there would have been an abundance of food - just like we experience today. The question is why in previous periods of feast there was no diabetes epidemic - as there is today.

Many of our views on diet and diabetes are based on epidemiological research.

It is very easy to be duped by statistical analysis - I and many others have written extensively on the traps - there are firemen around fires so firemen cause fires, policemen around crime scenes so policeman cause crimes but my favourite is that red cars get more speeding tickets than grey cars. (True - look it up).

Painting a car red does not actually make it go faster (true) but testosterone filled young boys buy red cars and drive them fast in the hope of attracting young girls.

So I am suspicious of these correlation exercises.

Combination foods

The importance of combinations of foods has received the attention it deserves.

Fats are generally simply a high energy source of fuel with little in the way of nutrients.

Carbs are readily converted to glucose which provides immediate energy.

The widespread view is that neither would appear to be particularly bad on their own but the combination has been slated as the cause of much of our health and obesity problems. Our bodies will always consume the carbs first leaving the fat to be stored away.

This could explain why both the extreme low fat and low carb - while apparently totally opposed seem to have some success when the amount of food is restricted.

Instinct - which can be a terrible thing in science but sometimes incredibly insightful - would say that a more balanced diet containing both fats and carbs would seem more natural.



This could actually be true if we introduced another component - fibre. The power of fibre to act as a sugar blocker is a not as well appreciated as it effectiveness deserves.

But unless we are cows we don't eat raw fibres - like a bale of hay. We get our fibre largely from vegetables and fruit.

We have to accept that people are different and we need to go through a process of individual experimentation to find out what suits that person.

I know that I simply cannot eat a lot of fat - my tummy rebels in dramatic style requiring the use of both input and output orifices.

But if I was starting a series of experiment to find the most appropriate diet I would start with a diet largely based on fruit and vegetables to provide a high fibre base but also

including moderate amounts of both tasty carbs (yes I like my cake) and some fats (yes I like a juicy pork chop).

I know for me this stops the hunger and cravings which are the death knell for training my intelligent puppy. If you want to train a real puppy you have to be nice to them first.

As long as the puppy is receiving nutritious food on a regular basis so it knows it is going to be fed it does not seem to mind a period of no food - fasting.

Diets which put the body under extreme stress from food restriction don't seem a good way of training our puppies.

I wish I could conduct a study to find the correlation between sadism and becoming a dietitian.

Cravings

Why do we crave food? Our bodies have a built in defence mechanism to keep us alive - but it has a design flaw. It can sense that we are missing a key nutrient or mineral but hasn't worked out a way of telling us what that particular need is - it just sends us a very powerful message saying go out and eat - something, anything - and it will keep on sending that message until it gets the key ingredient that it needs.

Bit random - but obviously it works because we are here and still alive - but it does mean that we may eat a lot more of the wrong stuff that we don't need. In the environment we evolved in this was not a problem - leptin would cut in and we would get back to our homeostatic or set weight.

It can matter now when we are surrounded by food.

Prevention is better than cure

I really want to emphasize that reversing diabetes is a two stage process. The aim of the first stage is simply to burn off excess fat so you are no longer insulin resistant.

There are many schemes for doing this and hopefully you can find an enlightened doctor to help you through the process. (I should slip in a word for the site run by Dr. Jason Fung - IDM Intensive Dietary Management Dr. Google knows them well).

Reversing diabetes is a relatively quick but rugged process which is demanding. But what happens when you are no longer diabetic? How do we stop you reverting back?



And even more important how to we stop this tidal wave of people who are becoming diabetic. This is primarily a food production problem so we have to look beyond the medical scene out to regenerative agriculture and the whole food production and distribution system. This is a big deal.

The giant unscientific experiment

Tests have been conducted on thousands of individual people all over the world to see if diabetes has been reversed so we can conclude - with some scientific confidence - that diabetes is generally reversible. Good science that works.

But we are conducting a monster unscientific experiment by changing our food system.

Diabetes (and obesity) have simply gone through the roof and I now I want to look at some of the theories which aim to explain this explosion, whether they stand up to examination and what we can do about it.

This is an area about eating, which is a topic I know something about - I have been doing it for almost eighty years. Joking aside I have been studying and experimenting on how to grow plants that make people healthy for some fifty years now (and made an awful lot of compost).

Sugars, oils, fats and salt

Everyone recognises the escalation in obesity and diabetes - a few minutes exploring on the web will give a whole range of different numbers from a variety of sources - all big - thirteen fold in the last fifty years is a common figure with most of the increase in the last

twenty years. Whatever the number you choose it is always big and depending on the region can be as high as 1 in 2 people are obese or diabetic.

That is just mind blowing and there has to be a definitive explanation - and of course a bit longer on the internet will reveal various explanations that this or that is the cause based on the results of statistical data (of the speeding red car quality).

You want to believe that fat is the real problem - just Google fat and obesity, Ancel Keys or anything like that and you will be swamped with data supporting that view.

You want to believe that it is sugar, processed foods, hydrogenated fats or high fructose corn syrup - you can find tonnes of supporting data just Google low carb, keto and diabetes and you will be swamped with data supporting that totally alternative view.

There is no shortage of theories.

Is it believable?

Is it really believable that 500 million people could suffer from diabetes with such a simple explanation as too much fat or too much sugar and processed foods?

What were people actually eating fifty years ago and were they healthy and does a simple explanation like too much fat or sugar really explain this rapid increase.

How does this explain that there are some 7 billion people - eating a similar diet who are not diabetic?

How does this explain that fifty years ago diabetes was rare - now it is everywhere?

We need to dig a bit deeper.

Back to the good (or not so good) old days

I am old, not far off eighty years so I have lived through the transformations in our food and lifestyle so how does my real world practical experiences compare with these statistical analyses.



My heritage could be described as rural village, I obviously know what I ate when I was a kid but I also know what my parents and grandparents were eating and I would guess that what I saw my grandparents eating was not that much different to what their ancestors going back maybe five hundred years were eating.

The food industry then was very local. Let me tell you there were no supermarkets or Governments statistician recording what people ate. But I know what people were eating because I was there and food then was simple and just plain boring.

Typical historic diet (from when I was a kid)



Breakfast may be eggs (boiled, fried, poached, omelette etc.), porridge, very basic cereal or toast.

Eggs were ubiquitous because most people kept chickens - it was part of the recycling system back then.

We ate a lot of bread - but there were really only two types - local bakery or home cooked - always crusty.

Lunch (or dinner) was even more simple, potatoes at almost every meal - normally boiled and cabbage - maybe the vegetable in season likes beans or peas and a small portion of meat - a slow chicken from the garden - or meat from the village butcher beef, lamb or pork.

Tea was typically salad (lettuce and tomato - home grown) or bread, butter and jam.

But the question every nutritionist will want to know - what fats and sugars were we eating eighty years ago.

Fats - lots. Mainly rendered from meat and saved from the cooking pots. Dripping - sometimes spread onto bread as a special treat.

And butter - used extensively in baking cakes.

The fat theory

Fat must be one of the most controversial topics in diet dating back to Ancel Keys and stirred up by Gary Taubes and Nina Teicholz.

That debate is well covered but I will make the comment that eighty years ago we were eating a lot of fats - animal fats - and diabetes was not an issue.

Is sugar really the bad kid on the block?

Sugar is now almost universally tarred as the bad kid on the block. But it is not that simple. (Google John Yudkin).

A bit of a history here - before the WW2 there was a lot of sugar imported from the Caribbean and used extensively in cake making. People made and ate a lot of cakes back then, large fruit cakes usually eaten after the evening meal and smaller cup-cakes eaten as a snack.



Hitler had a few 'not so good ideas' one was a fetish about cupcakes. He just didn't like people eating cup-cakes so sent out his submarines to stop that nonsense. He was successful for a while until people started growing sugar beet - a root vegetable that grows well in cooler climates - nothing was going to stop people eating their cup-cakes for evelenses.

I should put in a word for the code breakers who thought that people were entitled to their cupcakes.

But there was another major use of sugar - making jam or preserves. Sugar played a vital role in preserving fruit for the winter. This was definitely a time for eating local and eating seasonal so jam making was a major home industry, at the end of summer, when fruit was abundant and would be stored, along with potatoes, swedes, turnips, jars of pickled cabbages in dark and scary cupboards.



I became an expert in winter food storage as my big sister had a nasty habit of locking me in the storage cupboard if I was just too annoying or took her things to bits to see how they worked.

It is clear from the records that sugar consumption escalated from the 1850's right up to the 1940's and by the 40's people were eating a lot of sugar - but there was no diabetes epidemic - so we must keep on looking for the cause.

We now eat a lot more sugar - maybe double - but would that really increase diabetes by a factor of thirteen.

We need to look into the sugar question in a bit more detail.

How we ate

But it wasn't just a question of what we ate - it was how we ate. Meal times (3) and breaks (2) were very strict with no eating in between. Everyone sat up at the table and weren't allowed to leave until everyone was finished.

I remember this very clearly because the 'oldies' would talk about the most boring things like how good the carrot crop was this year instead of getting on and eating so I could go and finish off the fort with Malcolm next door before we were invaded by Greg Smith and his gang - clearly oldies have no sense of priorities.

Now all that has changed while I explain the wonders of compost to my granddaughters they roll their eyes around in total appreciation of the wonders of compost and play Taylor Swift full power to show their appreciation of their interest in compost.

But there was no eating outside of meal or snack time. Instead the 'oldies' had a scheme called working up an appetite which involved long walks before meals.

My theory at the time was that the food was so boring that if we weren't starving at meal time we would not eat and die and there would be no one to stand in the queue for ration books.

Collecting ration books was one of my most successful ventures. I did it for the whole street and got paid three pence per book. Much more successful than trying to work out how to grow healthy food so 500 million people didn't have to have their legs chopped off - which has been a continuous drain on my finances and time for the last fifty years.

It's amazing to me how acquiescent people are about having their legs chopped off. I've got a foamed titanium knee which is fantastic but I would still prefer the original. Lucky my skills in numerical methods and computer simulation bought in a bob or two or I couldn't afford this luxury of playing with compost.

Sunday Dinner/Lunch

I must talk about Sunday lunch. The tradition was to have a big meal, seriously big so we were really full (stuffed to the brim). This may seem totally irrelevant but it means that at least once a week our little puppy was trained into thinking that he would be fed, really fed - so he didn't really have to worry too much about there being no food.

Fit and healthy?

But the question is - were people back then really fit and healthy?

There is a great tendency to look on days gone past as some wonderful golden era we should all go back to. Let me tell you the keys to my time machine are firmly locked in the draw as there is no way I want to go back to those days - but I am happy to learn from them.

People got sick often - sometimes dying - and being sick was a rite of passage as we went through the childhood illnesses.

But were we fat and did we get diabetes?



Let's start with kids. There were very few fat kids - however hard I think I cannot recount more than a couple in my childhood. Unfortunately, it was a cruel era and they were very much ostracised.

I can compare this with today from my role as unpaid Uber driver for my granddaughter when I have ample opportunity to study kids leaving school while she just stands around chatting to her friends.

And there has been a change for sure. When I was a kid most kids were neither particularly fat nor skinny and not much has changed for the majority of kids - they may be a bit fatter now but generally most are still a bit on the skinny side. The weight of the kids in the median has gone up a bit but not much.

What has changed is the number of kids that are fat - which is now a significant proportion of kids.

People are not simply generally fatter - but there is an interesting change in the fatness distribution.

Kids as a whole are not getting substantially fatter (in general) but the proportion that are fat has increased dramatically so whatever is making them fat is affecting some kids but not all.

This may seem like mathematical nit-picking but is important in helping us play the 'why' game as we need to work out why some kids - but not all - are getting fat.

There must be a specific reason and it is certainly not that most people on average are eating more fats and sugars.



But what about adults? From my memory younger working age adults were thin, lean and muscular which would be easy to correlate with the bicycle, almost everyone had one and used them extensively for going to work, shopping, visiting people in the spare time and to a less extent recreation - but this was not a great time for recreation.



It would be fair to say that most kids and working age adults were lean with few isolated exceptions.

But as people aged they put on weight - particularly post-menopausal women - but even then - as now - men got a tummy.

Certainly there are more fat people (and definitely seriously fat people) now than back then.

But what is worth noting for our 'why' game is that these fat people did not get diabetes (of course there is the possibility that they had some level of diabetes which was not detected - our health service has vastly improved its diagnostics since then).

So we need to investigate further.

What a kid sees and we don't talk about



Kids can see things very different to adults and one thing sticks in my mind about all those years ago.

The technical term for what I saw, smelt, touched and probably inhaled is shit.

The outside toilet was a simple bucket - fondly called the memory mug (work it out - sick humour is not new). Every few days a hole was dug in the garden and the content of the memory mug offered as a tribute to the worms.

There were many small family style farms around where I grew up and I got a school holiday job working in one of them (probably now illegally for child exploitation).

It (add prefix sh) was everywhere on these farms and one of my jobs was to shovel it up and spread it around where plants were growing. At that time it was the predominant source of fertiliser but it also provided other ingredients which we were totally unaware of at the time - biology for the soil.

The soil had not yet been extensively worked as in modern agriculture and hygiene was a word which could not be applied to that era of agriculture.

We were not just eating different foods to what we eat nowadays but the way we were growing that food was dramatically different - we can be sure that the net result was more biologically active, nutrient rich food.

Fibre, cheese cakes and the holistic view

I tend to agree with the anti-sugar brigade - who will no doubt not be too happy with me saying that the sugar deal is a bit more complicated than appears at first sight.

We have to look at the total diet and in those days when people were stuffing into their cupcakes they would also be eating there regular boring meals of meat and two veg typically potatoes and cabbage followed by lettuce and tomatoes for tea.

These have a very high fibre content which can ameliorate the effect of sugar so those old timers may have remained diabetic free because while they were eating too much sugar (not so much as now but still significant) but what they ate was balanced by the high fibre.



Another major criticism of modern processed foods is that they are an almost irresistible combination of sugar, fats, salt, and wiz bang flavourings. Irresistible - absolutely just watch me in front of pizza and cheese cake.

Should we blame the manufacturers - possibly but they are just trying to make as much money as possible for their directors and shareholders (not the workers). That's the rule of our current society which may need changing but a lot of people are going to go blind and have their legs chopped off before that happens.

But we can do something about this right now. We love these foods because they give us a dopamine rush just like having sex (which is pretty important for our evolution).

Our bodies have evolved to have a control system which automatically - without us thinking about it - controls the amount of food we eat. We have learned not to stuff ourselves on Taro or Yam roots which provided the bulk of our ancient ancestor's food.

(The paleo philosophy hasn't quite understood that antelopes don't just stand there for us to catch and eat - the run-away - very fast.)

It is absolutely true that our bodies have not learned that while they taste real good we can easily overeat on pizza and cheese cake. But that does not mean we are doomed to a life of diabetes until the world order changes.

Training our internal puppy

Our control system is much smarter than the mechanical controllers I talked about in the beginning they have real (not artificial) self-learning capabilities.

As we have inherited a conscious brain - we can train our subconscious intelligent control system to stop us stuffing ourselves on pizza and cheese cake. We just have to think that we have a puppy inside us and we need to train that puppy.

This means we make slow adjustments towards a more sustainable diet and develop combinations of foods - for example creating sugar blockers by wrapping a high sugar banana in a lettuce leaf

We may need a bit of help from our doctor in puppy training - which is not part of their normal role. Part 2 is about paradigm shifts and doctors (who don't have a dog) need to make a bit of a paradigm shift.

Humans have real intelligence

Humans have far greater intelligence, some in our head which we use consciously, other unconsciously, some in our guts and trillions of foreign cells which like in swarm intelligence each cell is pretty dumb but by communicating to the next door neighbour has a surprisingly high level of overall intelligence.

Humans are remarkably good at this self-learning process and learning the wrong things is a possible cause of many of our control problems.

For example if our bodies 'learn' there is danger of running out of fuel it may decide to store extra fat for a rainy day. People get fat because their body has decided to raise the control point which may result in us eating extra food or cutting down our activity level.

People get fat because their control system has decided that we should be fat - eating more is just a resultant side effect rather than a root cause.

We can convince our control system that there really is a danger of starvation by going on an extreme diet so the control system receives hunger signals so stores extra fat.

The diet may work in the short term - but the control system will win out eventually - but it keeps the multi-billion dollar slimming industry profitable.

Don't get hungry

The alternative approach is to try and train our control system into thinking there is no threat of starvation by ensuring that there is a steady supply of all the nutrients the body needs and we feel full (or rather our puppy feels full) on a regular basis.



Training our puppy may sound exotic but in reality is very simple. Let me give one examples. I am a pizza and cheese cake addict. I will just keep on eating and eating until every bit has gone. But I have trained my puppy that when I eat chocolate or nuts that means the party is over - no more food.

So if (=when) I have this insatiable desire to eat that last piece of cheese cake I just pop a piece of chocolate or nuts into my mouth and my puppy knows - party's over no more food.

It really works.

The chocolate game

I invite you to play a little game - which is a variant of a well-known psychological test - to show just how important this intelligent control system is.

Put a few pieces of your favourite chocolate in front of you and just stare at it for some 5 minutes.



If you are a biochemist you will know that chocolate is made from the leaves of the cacao plant and contains theobromine ($C_7H_8N_4O_2$) which is a mild psychedelic drug.

If you are a South American Indian from the Andes you will know that any activity at the high altitude is pretty excruciating and chewing a few cocoa leaves is essential for survival at the high altitudes. You will also know that they are incredibly bitter.

If you are a food scientist you will know that the chocolate manufacturers put sugar, sometimes milk or flavours to hide the bitter taste (my favourite is rum and raisin.)

If you are a regular person you know that chocolate tastes real good and leaves you with a nice mellow - at ease with world - feeling.

As you sit there looking at the pieces of chocolate I would like you to become aware of the conscious and unconscious thoughts which will decide what you will do with the chocolate when the 5 minutes is up.



If you are old enough to have lived through the psychedelic LSD riddled 60's you may have strong conscious views - one way or another - on drugs.

If you are a dietitian you may have strong conscious views on whether the sugar in the chocolate presents an acceptable risk.

If you are a regular person you will watch your hand sneak out and put a couple of pieces of chocolate in your mouth then sneak out again and put another couple of pieces into your mouth and keep on doing this until they are all gone. This is your subconscious mind at work.

Our puppy inside us

We know in theory all we have to do to reverse diabetes is to let our bodies burn up excess fat allowing more fat to enter when needed.

But simple solutions to complex problems have a habit of not working.

We know that our bodies will always burn sugar (carbs) in preference to fat.

This has led to two totally opposed views on combating diabetes which are pursued with an almost religious fanaticism.

The first group argues that all fats should be eliminated from the diet so at least there is no new fat entering the system and after a while the total fat in the body will be reduced.

The fruit and veg and vegan dietitians are an important part of this group.

The second group argues exactly the opposite that carbs should be eliminated so the body is forced to burn fat.

Fats are not nutrient rich but they can provide all the energy we need without creating an insulin spike. Ketones which result from a high fat diet also suppress appetite.

Despite the ferocity of the arguments in the low fat or low carb battle when actually tested on real people there was not a great deal of difference in the final outcome - both camps were moderately successful - but not overwhelmingly so.

Herbicides and pesticides

The upswing in the diabetes explosion really started at the time when a range of herbicides and pesticides were introduced to agriculture. Naturally these were tested for safety in human food production and they passed the tests then current with the conclusion that the effect on the human body were small (although there was a question on the long term effect on cancer).



But the scale of use of one particular weed killer- glyphosate - is totally mind blowing some 9 billion Kg - that is about 20Kg for every diabetic - it defies imagination. And even more interesting the original patent was for roundup as an antibiotic. It may (or may not) damage people but it certainly kills bugs - that is what it was originally developed to do.

And it is literally everywhere - it is not just on the land - it is in our water system, in the air we breathe and most relevant it is in the food we eat - most vegetable we eat contain trace amounts of glyphosate.

I am highly suspicious of the correlation exercises which unfortunately abound in the world of nutrition so maybe we ignore the fact that the diabetes epidemic started at the same time as the large scale use of glyphosate - or maybe not - this is when a numerical analyst needs a bit of intuition on what correlation is really saying.

With 500 million diabetic sufferers worldwide now is not the time to enter into a prolonged academic debate when we can simply test this hypothesis simply, cheaply and with virtually no risk.

N=1

The traditional approach to diet is to conduct large scale epidemiological trials. Using a sample size of 1 gives perfect correlation.

I wonder if this n = big is really the most pragmatic approach and it may be better to take each individual one at a time.

So I will tell you my story of self-experimentation. I am not diabetic but my wife is. I think it is too big a risk to experiment on her and in any case she is my wife so by definition will not do anything I say. So I experiment on myself and if successful try and convince her that this is the way to go. Not very scientific but that's life.

But I do have a bit of a tummy so I can experiment with diets to reduce it.

A long time ago I started with conventional dieting by cutting down on what I ate. It did sort of work for a while but the fat was mainly coming from elsewhere rather than my tummy.

When a friend told me I was looking like a ghost I began to rethink. Then I got so hangry that I couldn't talk politely to anyone and finally I got so ravenous that some trivial issue made me lose my temper so I lost my cool - my body (not me - I said stick to the diet) decided it was time to raid the chocolate biscuit tin.

My cute little puppy had turned into a ferocious guard dog which was saying eat or else.

So I changed tack and decided I must satisfy that puppy. I decided that I was going to have at least one good meal a day when I (and my puppy) felt completely satisfied. I was growing my own vegetables so I made sure there were all the nutrients and trace minerals in the soil together with plenty of biology (compost).

Often that big meal would be breakfast - sometimes lunch (and sometimes both) but for the rest of the day I would eat nothing or a bit of yoghurt and fruit or a bit of cheese in lettuce. I progressively reduced my eating window from some twelve hours down to six. If I cut it back too quickly I would get hunger pains but reducing it slowly kept the puppy happy.

I did experiment with bullet proof tea (basically add a bit of coconut MCT oil to my green tea) - that certainly curbed any hunger pains - my puppy is a bit of a wimp.



There is another little admission I have to make. I married into a Chinese family so we visit China a couple of times a year. Real Chinese food in China is an experience not to be missed so there was no way I was going to miss out - life is too short.

On each trip to China I would put on some 5Kg but when I came back to Australia and went onto my alternate feast and fast system I would gradually lose weight bringing me back to my homeostasis level.

If friends come around and we have an evening meal I join in despite the fact that I normally either skip or have just a light early evening meal. As they say dieting is not so you can fit into a smaller coffin.

Would I describe this as overwhelming scientific success - not really but I can keep my eight under control and enjoy life - it is a routine which is very pleasant for me and keeps my little puppy happy.

I do think there is a lot of sense in following the feast and fast routine rather than fasting to the point of tension. But I think everyone has to find their own schedule which they can maintain rather than having a dietitian force a diet which is unsustainable and simply turns the puppy into a guard dog.

There is a big difference between theory and practise when it comes to diet. I am a miserable failure - I just get hungry and attack the cake bin - but I have had success with intermittent fasting. Now I just add lots of baby greens straight from my Gbiota beds to most of my meals so I always feel satisfied - seems to work for me.

The big things about baby greens is that you beat the bugs to the food so you don't need any toxic chemicals, they are tender so you can add them to most meals and above all they are full of nutrients and biology so you don't get hungry and you little puppy is happy.

This experiment on high green loading is still a work in progress but as the man who was falling of the skyscraper said 'everything fine so far'.

Summary of part 1 where we are up to

Stage 1 reversing diabetes

We know that we have a sophisticated highly intelligent control system inside us made up from our head and tummy brain and trillions of microbiological cells - our gut biota. Puppy is quicker to type.

This puppy decides what is going to happen - he is the boss. The highly complex biochemistry is simply implementing the decisions taken by the puppy.

We know that diabetes is caused by the fat cells (which are available for storage) becoming so full so they cannot take in any more fuel so there is no way for the biochemistry to control blood sugar by storing fat - so you are diabetic.

You need to need to create some empty space in the storage if; -

- a) You are taking diabetic pills which will prevent you from reversing you diabetes - you simply have to get off those pills to avoid a hypo.
- b) If your sweet little puppy is taking all the goodies that you are eating - all those micro nutrients, minerals, vitamins and other good things essential for life and simply stuffing them into your fat cells. You may have plenty of these goodies in your body but they may be locked away in safe storage so your body has no access to them.

We know that most people can reverse their diabetes by burning off some of this fuel which makes room to store more fuel when needed.

There are many options for burning off this fat.

The low carb high fat group argue that fat is healthy. They have some solid arguments Modern evidence indicates that the fats that were once so demonised are not really that harmful, they do provide high energy without stimulating insulin but it is unlikely that drinking litres of olive oil is going to make you lose weight.

Saying fats are not unhealthy is different to saying fats are healthy.

The low fat high carb group are right in thinking that excess fat in the storage cells is the cause of insulin resistance, but eating high glycaemic carbs stimulate insulin production which can lead to insulin resistance as the carbs are going to be converted to fats anyway.

The anti-sugar anti processed food brigades have some seriously solid arguments which could be weakened as every cell in the body uses glucose for fuel. Fructose can only be processed by the liver - which it does perfectly well as long as the quantities are not excessive.

The fruit and veggie brigade have a solid argument that most veggies are low glycaemic so don't cause insulin spikes and contain essential nutrients, minerals and phytonutrients and apart from B12 can provide all the known essential nutrients.

Eating a lot of greens can make you feel full - so keeping your little puppy happy - without creating a lot of insulin. (Fasting mimicking).

All of these systems have one thing in common - periods when you are not eating (or at least not eating insulin generating food).

You just have to accept the fact that you need to fast (or eat fasting mimicking foods which may still be nearly as effective but keeps the little puppy happy).

It may only last a few weeks but it is going to be rugged.

In the phase when diabetes is being reversed it probably is not super critical which option is chosen as the amount of food eaten is going to be highly restricted anyway.

If all else fails get someone to fly you out to the middle of the Simpson Desert with 20 litres of water, a compass and some foot plasters. Walk (and walk) East until you get to Woollooboola which will take you a couple of weeks and get checked out with Dr. Jones at the local clinic and I won't be surprised if you are now totally free of diabetes.

Stage 2 living a normal life

The problem for the people who have reversed their diabetes once they have finished their few months of semi starvation and the other 7 billion people on earth is how to live without

getting diabetes. Exercise, stress management are important but nothing will work if the diet is wrong.

The key is to have a cycle of; -

- a) some eating periods where you eat a good balanced diet with all the minerals, vitamins, phytonutrients for health so your puppy is totally satisfied and does not turn into a ferocious guard dog so all the good things you are eating get locked away in fat cells
- b) noneating periods when your body can extract and burn fuel from your fat cells.

If at any time in your life your puppy has suffered from general lack of food, lack of essential micro-nutrients, toxins or other nasties you will need to treat him very gently so he does not turn into the nasty guard dog.

But all these are solvable we just need a paradigm shift to make it happen. This must embrace diabetics, their doctors and health professionals and managers and our food production system.

So onto Part 2 where I talk about how to create a paradigm shift.

Part 2 reversing diabetes making it happen

A bit about paradigm shifts

I have learnt a lot about paradigm shifts - see the scars on my back from when I challenged the conventional wisdom.

I am going to use my personal experience to illustrate how to create a paradigm shift but a quick overview will make it clearer.

There is always a conventional wisdom based on the current model of how things work which most people accept is the right way to do things and it sort of works.

For example diabetes is caused by eating too much of the wrong sort of food and lack of exercise and - once you are diabetic it is totally irreversible.

Then along comes a new model which is in conflict with the old paradigm.

For example that diabetes is caused by us screwing up our intelligent control system which has evolved to manage what and how much we eat - and diabetes is generally perfectly reversible.

To implement this paradigm shift requires some major changes in behaviour.

For example a doctor has spent many years studying the art of medicine and is regarded as an expert in the field.

A patient goes to his doctor and hopes the doctor can correctly diagnose his complaint and cure him. The traditional role is that the doctor is the active component and the patient is passive. Doctors talk about compliant patients who do what they are told.



Doctors following the classic route will prescribe drugs - escalating in strength to really nasty ones like sulfonylureas. These make the pancreas release extra insulin which will increase insulin resistance e.g. making diabetes worse not better. They increase the likelihood of a heart attack three times - nasty stuff.

For most people diabetes is not a disease like the black death (although it is on the same scale) - it is society inflicted collateral damage.

The first step is to repair this collateral damage.

The second is to protect against further damage.

The third stage is to look at changing society so this collateral damage does not occur again.

In the new paradigm the doctor-patient relationship changes. The patient is no longer compliant following instructions but takes the initiative - using the technical expertise of the doctor to decide what changes in diet and exercise and stress management is needed to first reverse his diabetes and then to maintain it on an ongoing basis.

The patient needs to take control by managing whatever diet is agreed on and training his internal puppy. The doctor has to hand over control to the patient and become a source of information and support, an adviser and councillor.



This is already happening with the internet. People may laugh about Dr. Google but the reality is that patients with a serious disease will naturally learn about the disease from the internet and may end up knowing more about that specific disease than the doctor.

In any paradigm shift there are several players.

There are those who have serious problems - in our case the diabetic patient - but they may not be able to make the change unaided.

There are those who have the skills and technology needed to make change happen - the doctors and medical professionals. But they may feel constrained by the circumstance in which they operate - what doctor would want his license revoked.

I have heard of cases where doctors have had their license to operate challenged because they were offering dietary advice which they were not qualified to provide.

As food is the key to health my question is -‘**why weren’t they properly trained?**’

Then there are those who oppose the change - this can be the drug and food companies who make a lot of money from diabetes.

Then there is always a hard core who oppose change just because it different.

You only have to look at climate change where there is a solid group of climate change deniers who will never change. The numbers have not changed in the last twenty years - you just have to wait for them to die off and the kids to take their place.

The power of medical procedures



Just what makes the practise of modern medicine so effective? It is the highly refined medical procedure. Every step has been carefully refined over thousands of operations - every operation in a verification of that procedure.

But the disadvantage of this process of rigid procedures is they are very difficult to change - and over history some have been totally and utterly wrong and took years to change.



Doctors routinely used the process of 'blood letting' to cure some problems - and if it did not work they would let out more blood giving the poor patient reduced chance of survival.



Then of course there was the use of leaches.

But perhaps the most famous case was poor old Ignaz Semmelweis. Based on admittedly empirical observations he concluded that patients were dying from some form of contamination because surgeons were not washing their hands before operations.

He was ridiculed by his profession - basically run out of business - and ended up in a mental hospital being beaten to death by the supervising medical staff.

Yes - trying to change medical procedure is a bit of a challenge. I hope I do not suffer the same fate as Ignaz for writing this.



So the pressure for change has to come from diabetics themselves. Many doctors understand the need for change but are locked in by the system; they do not want to lose their accreditation.

A doctor may feel he is obliged to prescribe a drug like sulfonylurea to bring his patient blood sugar under control - and they really do work - I have seen the results.

But the patient may go home and have a quick chat with Dr. Google and find out that this drug increases the chance of a heart attack three fold. He (or in our case she - she being my diabetic wife) may decide that a better choice may be to start eating a bit more spinach and bitter melon (which she hates but are just as effective in lowering blood sugar as sulfonylureas but don't cause heart attacks).



She can then tell her doctor that she is taking the decision she will not take the sulfonylureas - thanks you very much - and will manage her diabetes by diet.

The doctor may privately agree with this decision and be delighted she can label the patient as non-compliant - that way she does not have to worry about being struck off.

Not anti-doctor

Any doctor reading this may begin to feel that I am anti-doctor - not so - I owe my life to dedicated doctors so I want to tell that story.

Some fifty-five years ago I had a burst appendix and nearly died but was saved by a surgeon who whipped it out real quick. Thanks for that Mr. Surgeon.

But he told me a bit of a porky - not his fault - it was the conventional truth at the time. He said my appendix was totally useless and was better out than in.

But we all learn - and now we know that the appendix is used to store a reserve supply of bacteria which can be used to replenish our gut bacteria if it gets compromised (evolutionary by hunger now by excessive anti-biotics). Of course, at that time no one knew how important gut biology really was. Had I known that I would have put much more effort into looking after my gut bacteria - but I didn't.

But gut bacteria play a major role in overall health - which includes the heart.

Then some thirty-five years later I was told by another surgeon that there was only 2% left open in my main artery and I may not last the week - but he could operate on me first thing in the morning. He did and I lived - thank you Mr. Surgeon. Maybe had I understood about

the relationship between gut biology and health I may have avoided this heart operation - but I didn't and still survived.



Then I got pancreatitis and I needed to have my gall bladder removed. Again, I was told the gall bladder was not really important - just have a spoonful of Metamucil each morning. I later learned that if you have your gall bladder removed (which gives a precisely timed squirt of bile to digest food) then you should really adjust your eating habits to compensate.

I have had several other major surgeries but my pride and joy is a foamed titanium knee joint (the foaming gives the same stiffness as my bones avoiding stress concentrations - something as an engineer I really appreciate).

But the key point is I can go to hospital for a major operation or take antibiotics for some serious illness with as near as possible to perfect confidence in the medical systems to provide me with ultimate care.

Healthcare really works - but what about diabetes?

Diabetes comes to our house

My wife was a fit and healthy surgeon while living in China but within three years of coming to Australia she developed diabetes.

Our medical advice was that diabetes was a chronic irreversible disease - she would need progressively stronger medicines then she would need to go on insulin injections, she ran the risk of going blind and having a limb amputated and would probably die young from a heart attack. Great bedside manner!

And sure enough - as predicted - she got to the stage where she began to lose her eye sight and as a result fell down a flight of stairs and broke multiple bones in her foot. After an initially successful operation her foot started to turn black and the discussions turned to amputation.

If you want to focus someone's attention tell them their wife and loved one is likely to spend the rest of her life as a blind cripple in a wheel chair. Yes I am obsessive but with reason.

I needed to understand diabetes - I mean properly understand diabetes - what were the basic causes and what could be done to rectify it.

A short story - once upon a dinner time



Imagine one Sunday morning you are sitting at your terminal writing an article about swarm intelligence - how ant colonies can show remarkable intelligence yet individual ants are - to be plain - pretty stupid. Despite there being many more ants than people not one single ant has ever won a Nobel Prize.

Your partner opens the oven door and out pours the scent of dinner. Your body leaps into a web of conscious and unconscious actions. You may just be aware of an increase in moisture level in your mouth as your saliva glands leap into action but you will be totally unaware of your gallbladder preparing to give a squirt of bile juice to help digest your dinner or your pancreas preparing insulin to prevent a sugar spike.

You will certainly be aware of conscious decisions you take - it is time to hit the save button on your beloved article on swarm intelligence even though you know there is probably no one interested enough in swarm intelligence to read your article (but it really is fascinating - honest).

You will lay the table, open a bottle of red and pour a couple of glasses and in a few minutes you will be munching away.

Without you realising it your body is using a lot of energy to digest the food - let alone the wine - so you begin to feel drowsy and lie on the couch with your partner for a little cuddle and snooze.

While you are in the land of nod you do not suffer from hypoglycemia with your blood sugar rocketing through the roof so the sugar blocks the fine blood vessels so when you wake up you find you have gone blind and your feet have turned putrid.

Instead you wake up feeling fine and full of energy so you decide it's time for a walk in the park without any thought for the intelligent system which has been looking after you and protecting you while you snoozed and cuddled.

But it is this intelligent system we have been screwing up and if we are going to reverse mass diabetes we have to undo this screwing up because just swapping to a low fat or low carb diet or taking metformin is not going to halt the diabetes epidemic -we have to stop damaging our intelligent control system which is working to protect us.

The why game

We are in the middle of a major epidemic - at this moment there are some 500 million people suffering from diabetes, this is a thirteen fold increase in the last fifty years and most of that occurred in the last twenty years. The numbers continue to increase exponentially at 4% p.a.

The classic paradigm in the medical profession is that diabetes is an incurable and progressive disease - it just gets steadily worse and needs to be treated with stronger and stronger medication until insulin injections are needed. Blindness and amputations are typical and often patients die young from a heart attack.

We need to change this to the new paradigm that diabetes is caused by damage to our intelligent control system which leads to fat cells becoming too full to take up any more fat and that diabetes can be reversed in a two stage process.

The first stage is to burn up the excess fat so the patient is no longer diabetic.

The second stage (which applies to anyone at risk of becoming diabetic) is to adopt a life style and dietary change and to train the intelligent control system - our internal puppy - so it manages this automatically without us even thinking about it.

Dr John Snow



This paradigm shift requires that doctors change their classic role of purely medical activity and take action which changes society.

There is one story I really like and that is about John Snow (who was a qualified doctor) who was facing a cholera epidemic in Soho London in 1813. He decided (sensibly) it was pointless trying to treat all the cholera patients in his overflowing surgery and he had to find the cause.

Playing the 'why game' he kept on asking questions until he found the root cause - he identified the problem as a contaminated pump which was collecting sewage water.

He removed the pump handle and the epidemic stopped.

I take two lessons from this story - first to keep on burrowing down asking why until you have unearthed the real cause and - secondly taking a much broader view of the problem.

Fixing leaky sewers may be one of the less glamorous roles of engineers but its role in stopping epidemics before they start is far more effective than all the wonder (or not so wonder) drugs used to combat epidemics.

My wife is a doctor and I am an engineer so we argue a lot - the roles of doctors and engineers in health is one topic - but that does not rival the arguments over the wonder of compost - I compost everything - she is not a compost person. But she has promised to compost my body if I die first.

As Dr. John Snow realised trying to treat a mass of ill patients is beyond available resources just as trying to treat 500 million diabetes sufferers is beyond available medical resources.

We have the most sophisticated and effective medical system of all time but we seem impotent to stop the diabetes epidemic - time to rethink the strategy.

It's fun to reflect on the enormity that resulted from John Snow's action.

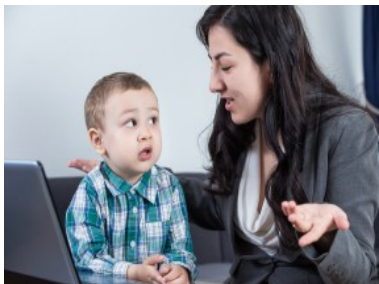
At that time London was the fastest growing city in the world and had pretty much reached the limits of its expansion because of the crisis caused by lack of a sewage system (OK it had the streets). John Snow's action led to the creation of the London sewage system which became a model for all large cities enabling them to grow to multi-million populations.

John Snow was an enabler for the modern city.

Data and understanding

We live in the information age - we are simply swamped by data but we can learn from watching a child grow up and appreciate the importance of the 'why game'.

A young kid will drive his parents mad asking 'why' all the time - he has no understanding of the world he finds himself in and is just trying to work it all out.



Mum - why have you got diabetes?

Because fat is blocking sugar getting into my muscles.

Mum - why are you fat?

Because my tummy tells me I am hungry so I eat all the time.

Mum - why don't you just stop eating?

I did and then my tummy got frightened there was no food and forced me to eat

Mum - has Dad got diabetes?

No

Mum - has grandma got diabetes?

No

But she is much fatter than you - why has she not got diabetes?

Enough! Go and ask grandma.

Then the kid turns into a teenager and begins to accept the way the world is.



Why were you so late home from Roger's party?

'Because'.

Because is the latest way that teenagers say that is just the way the world is. The question has changed from 'why' to 'what'. Just like diabetes.



Then the teenager grows up to be a research biochemist. Now with gas chromatography, electronic microscopes, MRI and many more sophisticated machines he collects far more data than he can possibly comprehend without knowing the governing rules.

This is where the 'why game' comes in.

General laws simplify



Before Newton put forward his laws of motion scientists conducted the most bizarre experiments like dropping balls from galloping horses to find out where it would land.

But when Newton put forward his three simple laws of motion - which would barely fill a post card - everything was understood and those seemingly insoluble problems could be readily solved.

Now I must go back to being an annoying kid - just keeping on asking questions to see if I can really understand diabetes and then hopefully find out how to reverse it. But before I do that a little background may be helpful.

Learning about paradigm shifts

I have learned about paradigm shifts the hard way. It is worth telling the story.

I have an adolescent fascination with big machines that go clunk, whizz, bang. That's how I ended up as an engineer - I just like designing machines - had a been borne a hundred years earlier I would have been entirely in my element in the railway era designing bigger and faster steam engines.

But I did spend my early time as an engineer designing machines until about a decade after I had left University, I decided I could be getting a bit out of date and decided to take a couple of years sabbatical at the bottom of the academic tree as a humble lecturer at the local Uni.



And there I discovered computers - now this is well before Bill Gates, Apple and Microsoft and for those of you who are weren't alive then there actually was a pre computer dominated age - but not like today - it was all punch cards which were invented to make sure the computer revolution never took off.

But then I found that if I stayed back real late - as staff - I could work on the master consul and my discovery of the terminal literally changed my life.

It hit me like a sock in the face from a prize fighter that this was going to totally change the way engineers worked.

Engineers aren't very good at public relations but we had been pretty effective in hiding how we actually went about our work.

Or course we learned all the formulae and laws of mechanics, strength of materials, thermodynamics and all that stuff at University - but when it came down to designing machines we would look at what we had done before - make it a bit bigger or smaller as our gut instinct told us - and off to the machine shop to see if it actually worked.

There simply wasn't time to calculate things we should have - and in any case working with slide rules (remember those) is a bit of hit and miss affair which needed multiple checking to ensure you had a sporting chance of getting somewhere near the right answer.

But as the stars cleared from the prize fighter punch, I realised that the computer (with a live terminal) was going to totally change the way engineers went about their business. We could now calculate rather than guess.

A moment of madness



So in a total moment of madness I went home, took out a second mortgage on my house and bought myself a computer. It turned out to be the second microcomputer bought into Australia and cost one third of the value of my house - and they did not lock me up.

And I started to write code - with an absolute fanaticism - often working overnight just stopping for breakfast.

And I was right on one score - the ability to efficiently undertake calculations was changing engineering design.

But there was another (welcome) benefit I had not anticipated - the power of simulation.

You could make a computer model of a machine or process and then spend a happy afternoon playing with the simulation trying this and that just to see what happened. I could conduct hundreds of experiments for virtually nothing and learn things I could never learn by physical experimentation.

And lo and behold - what I often found was totally different to the way industry generally thought and were designing their machines or doing their job.

Of course, the first reaction is to think you have goofed and made some mistake in the code (easy enough to do) but after hours of bug hunting and double checking you eventually convince yourself that this is for real.

No one likes to look a dork so you don't tell anyone and instead quietly go out and test the idea with real hunks of metal and when that tells you that this new idea is right and the prevailing attitude is wrong you actually believe it.

The wonderful world of paradigm shifts

Paradigm shifts are about changing models. There is an existing model of how things work and you develop a new model which supersedes the old model.

This is not a good time; you have a new paradigm which is in direct conflict with the accepted paradigm - not a position of comfort as you are ridiculed by your profession.



Let me tell you it is virtually impossible for one person to achieve a paradigm shift. You need to find someone who has a really serious problem so they are willing to try a new idea - and if it works they become a disciple and convince other people who convince other people and you have created a paradigm shift... The trendy word is going viral.

It is virtually impossible to get a paradigm shift unless there is some serious problem to resolve - life is just too comfortable to go through the agony of change - but if there is a big enough problem and you can get the disciples - then you can make the paradigm shift happen.

I learned a lot about paradigm shifts and can certainly claim to have initiated quite a few and resolved some serious problems.

But now I face a paradigm shift of what seems impossible difficulty but has really serious implications - to be precise the lives of 500 million people who seem doomed to a life of diabetes and its highly unpleasant consequences (blindness, amputation and death by heart attack).

Soil and water

But back to my story - maybe I was getting a bit of a conscience about the damage to the world that my love of big machines that go clunk, whizz, bang was causing to the world but I became highly concerned about the way humanity was destroying the soil and water on which human life depends on - no soil - no food - we die.

So after twenty years of living on my terminal I sold my company - which had grown to become the world leader in its field - and turned to the wonderful world of what we now call regenerative agriculture but in reality meant swapping a love of machines that go clunk, whizz, bang for piles of compost, earth worms and soil biology.

Someone must have appreciated my love of computer simulations because the company I founded continued to grow and was eventually purchased for \$500 million dollars - while I dug holes and collected the weirdest of micro creatures to peer at in my microscope - creatures even too horrifying to cast in Dr. Who.

But I did realise one thing about food. People are totally wrong to worry about whether we have the technology to feed the ten billion or so people we expect to inhabit the earth. Technically if we got our act together on recycling (including from the sea) we can readily produce enough food to fill ten billion tummies.

True today there are almost a billion people who do not have enough to eat but that is because of humanities inability to operate viable and equitable political systems and our great desire to go around killing and fighting each other.

The challenge with food is to grow plants which lead to food which actually makes people healthy - which is very different to growing plants which are themselves healthy.

The power of simulation

I had learned the power of simulation. These simulations were based on coding the basic laws of physics, gradually refining them until they were reasonably close to reality - then using the simulation to experiment and learn things that would be impossible to learn from real life experiments.

With diabetes there is an obvious need for the equivalent of computer simulation we can experiment with and test out new ideas - but that is not practical at this moment.

But we can make a mental model of the human body by making a model of it thinking of it as a thermodynamic machine. This is perfectly valid - we are thermodynamic machines turning food into useful work and we can understand how the body works as a thermodynamic machine.

That helps us developing some very useful concepts which may help us in reversing diabetes.

But first I have to explain two worldly realities about how science and technology actually work - which is not the public image.

I don't fully understand but can still do

The first relates to the myth of a smooth progression from research to application the second relates to the general solution.

There is this popular image of a scientist working away in the lab doing fundamental research which leads to some exciting breakthrough which changes the world.

Then (e.g. later) engineers, applied scientist, entrepreneurs, sales and manufacturing people pick up the ideas and turn it into reality.



It is good PR and sometimes it is the way the world works - but not always or even often. Many great breakthroughs - like the steam engine, the aeroplane and even the computer occurred because there were people who despite never really understanding something at the level we now call true scientific understanding - just knew enough to get something to work - even if not that well.

The test for a scientist is 'is it true?' (Or more accurately is it extremely probable that it is true) the test for an engineer is 'does it work?' Once it is proved to work the scientific community is encouraged to invest its talents and skills to develop the scientific understanding.

Let me be honest - I was a pioneer of the computer revolution - I lived and breathed it - and when I look at the complexity of how our internal computer manages to control our food intake and energy balance I feel we are looking at a development project running into many decades.

But if we focused on answering those two critical question; -

- why are so many people diabetic now when they were so few even a couple of decades back

- why are some people apparently immune to diabetes when they are doing everything against current wisdom

We could then come up with a pragmatic solution to reducing the current 500 million diabetic to a fraction of what it is now.

The general solution

The second myth of science is the general solution.

The Holy Grail in science is to come up with some general law - a fundamental truth which can be universally applied to solve real world problems.

Newton's laws of motion would be the classic example and maybe one day we will have a general law for diabetes.

But there is a time factor here - it takes a long time for a law to be accepted as a general truth and in the meantime there are 500 million people going blind, having their legs chopped off and dying from heart attacks. While you are reading this a dozen people will have had a leg chopped off - unnecessarily.

Do we really want to hang around waiting for this general law of diabetes to emerge?

People - particularly their gut biology - are all very different so it will take many years of this general law to be available.

But we can develop a system which we can prove works with one person, then two then four, then sixteen etc. - all the time we are helping people. We may eventually arrive at the general solution but why wait for that - we need to get started.



This is the pragmatic engineering approach and every engineer is interested in one question - does it work? So we need a test to know if the system is working for each person.

With diabetes the test is simple - is their blood sugar level stable without using drugs which artificially control blood sugars.

As I have pointed out drugs are highly effective in controlling the symptoms but can actually increase insulin resistance so we need to manage the blood sugars without drugs.

Part 3 Making it happen

Making it happen

How do we change the diabetes paradigm? First job is to be absolutely clear on what the old and new paradigm say.



The first part of the old paradigm says that insulin resistance is caused by some mechanism (imaged as chewing gum) that is stopping fuel entering the fat cells used for storage and this cannot be reversed.

The second part of the old paradigm is to lose weight by manual management of the food intake.

The new paradigm says that the body already has an intelligent control system which can automatically control weight and prevent diabetes but we compromised the working of this system by a combination of foods novel to the control system and toxins

We need to retrain the intelligent control system to adapt to these novel foods and avoid toxins.

The new paradigm says that insulin resistance is caused by the storage fat cells becoming so full they cannot take up any more fuel and this can be reversed by burning off the fuel inside the storage cells.

Who suffers

To make the paradigm shift we must first identify the group who are suffering - obviously the diabetics but they cannot make the change themselves they need the support of their doctors who can coach them through the change.

They also need ready access to the sort of food that will make them healthy.

We can expect that there will be resistance from the food and drug industries and from the conservative elements within the medical establishment.

A journey of 10,000 miles is best started by buying an airline ticket
(Apologies to Mao Tse Tung and his mega march)

Theoretical arguments rarely work in a paradigm shift what is needed is a demonstration that it works.

This is not going to be achieved by some giant epidemiological trial but on a case by case basis which can be documented on the internet and hopefully go viral so all diabetics are aware of the options open to them.

Eventually the ground swell will rise and people will come to accept that diabetes can be reversed by natural means. (Apart from the professional deniers but they die off anyway).

Starting the paradigm shift

The diabetics provide the motivation for change. Going blind, having your legs chopped off and dying from a heart attack is called motivation.

Don't miss this point - they have to be the driving force for the paradigm shift.

The push is not going to come from the doctor, the Government, the food industry or the drug companies - diabetics have to drive this paradigm shift and they have to be real pushy if they don't want to become a blind cripple.

But here comes the bad bit. To reverse diabetes naturally means an initial period - maybe a couple of months - while you burn off the excess fuel. There may be various options for

doing this but at end of the day they all involve food restrictions and are pretty rugged - not nice.

This may reverse your diabetes but if you have got diabetes in the first place you are prone to getting it again so you will need to go onto a balanced program of eating healthy food, a bit of exercise and managing stress (as far as possible).

The alternative is to pop pills. Initially this is far more pleasant but it will not cure your diabetes and you will probably die from a diabetes complication (most likely a heart attack).

Can't be done alone

But now the snags come. Apart from a handful of incredibly determined people they cannot do this by themselves.

They need support. They need the support of a group - fellow diabetics - who can provide the information, particularly that from their own practical experience.

They need the skills and technology of their doctors to coach them through the change and help them reduce their medication in a progressive way.

They need access to the food which will make them healthy. That's sounds easy but that is probably the biggest hurdle.

They need to minimise fructose and harmful fats (hydrogenated oils) which are in almost all processed foods.

They need food which contains the biology, micro nutrients, trace minerals, vitamins and phytonutrients which were once normal in food but with soil degradation and the use of chemical fertilisers are now largely missing.

They need food which is free of toxins which damage our gut biology; these toxins are so widely used they are in most foods which are readily available. Getting access to food which don't harm us and make us healthy may be the biggest problem to overcome.

They also need to be able to resist pressure from the food and drug industries and from the conservative elements within the medical establishment. Advertising works - that's why

these corporations spend so much money on it and it takes courage and conviction to tell your doctor that you are not going to take those pills.

Food, exercise and stress

Reversing diabetes without drugs means focusing on food, exercise and stress - let me comment.

Stress does all sort of horrible things to your hormones which affect blood pressure and honestly pretty well everything. I have no magic for avoiding stress. If you are stressed about going blind, having your legs chopped off and dying young then I am not going to tell you that sitting cross legged staring at your feet will make the stress go away. Life with diabetes is just loaded with stress.

If you are stressed because your boss is giving you a hard time then you can read about Gbiota beds, tell your boss which particular part of their anatomy they can stick their job and become a Gbiota grower of healthy food. There are 500 million people at there who want to eat healthy.

If you are stressed because you wife does not like your monster compost pile - find a solution and email me - please.

If all else fails just go for a walk.

Exercise If you like exercise great. If not - don't bother with expensive machines or gyms - just go for a walk. What really matters is regular movement so avoid long periods of sitting. The easiest way is to drink lots and lots green tea. Green tea is very beneficial for diabetes anyway but it also makes you go to the toilet - a lot - so you will have a lot of movement.

Reconsider this advice before taking a long plane journey.

Food is the biggy. People are always complaining to me about the power of the food industry and how difficult and expensive it is to buy healthy food.

Let me respond. The food industry has a lot of power (as illustrated by how they manipulate Governments on food labelling which is a farce). That power comes from

having a lot of money - but the food industry had no money of its own - they have a lot of money because you give it to them by buying their products.

If you want to defeat the giant corporations - easy - just stop buying their toxic products.

The battle for healthy food.

I am not an evangelist. If people want to eat sausage rolls and doughnuts and get diabetes that's their decision but if people really want to eat healthy food I can help.

Some twenty years ago I developed the Wicking Bed system as a means of providing sustenance food in Africa in times of drought. They had to be incredibly simple and cheap as the average wage was \$2 per day - but they worked well.

There is a particular thought process - which I believe started in the computer industry - which says that once you have something that is working well and doing its job it must be upgraded so it is more complex, expensive, difficult to use and not work as well as the original.

That's what has happened to Wicking Beds but if people want to go back to basics they can grow many healthy vegetables virtually anywhere they live (just need a bit of light and of course compost) at minimal cost often from scrap - old bath tubs, wheel barrows, tote boxes are all great.

I have recently further developed the technology called Gbiota beds to make it more suitable for larger scale commercial production although they are fine in larger gardens for home use.

I am really encouraging people to grow some of their own food but for many it is just impractical. Gbiota bed were developed so commercial growers can provide food of the needed quality to reverse and prevent diabetes (or just make people healthy).

The Gbiota club

Change and paradigm shifts really need a cooperative group for mutual support and no one person can possibly know everything that is needed.

That's why I formed the Gbiota club.

The aim of the Gbiota club is for members to grow some of their own food to supply the biology, micro nutrients, vitamins and phytonutrients essential for health. Members can monitor their own health, and undertake their own trials with support of the group and hopefully their doctor and share their experiences with the rest of the group (and the whole world for that matter).

Gbiota beds are a growing system primarily for small fruit and vegetables where plants can be grown which will reinforce gut biology - a key component in our intelligent control system - growing food free of toxic chemicals which may harm the gut biology and provide minerals, trace elements and phytonutrients which are generally low in industrial-chemical farming.

They are a development from Wicking beds which are now a well-established technology for home growing. Gbiota beds are suitable for larger scale growing which would make produce of the right quality widely available. They can be used for home growing in larger gardens as well as commercial growing.

The Food for Health movements - corporate greed and non-profits

There is a growing awareness of the role food plays in our health and how this link has been damaged by corporate greed and the lust for power in the establishment.

There is recognition that the internet is having major changes in the way the world works - much is beneficial to society. Its use for information - enabling the ordinary citizen to access information never possible before is overwhelmingly positive. On the other side the use of the internet for profit, power and manipulation is seriously concerning - particularly when coupled with near monopoly power.

I am sure the food industry is operating within the law - but its products are certainly a key factor in the global health epidemic.

All the doctors I know personally are decent human beings with a genuine concern for their patients - but they are typically constrained by the system they work within.

I don't mix in political circles but I am sure many, if not most politicians, have the interest of the community at heart but the reality is they seem unable to curb the power of the corporate giants or make effective changes to our medical system.

But there are some good stories on the web where honest and well intentioned organisations have achieved considerable success without compromising their principles. Wikipedia, The conversation, Firefox and Libre Office are examples.

I have just bought a new computer and as a matter of routine I was about to install MS Office but they have changed the way they license in a way I thought antisocial. So I searched around and found Libre Office which is free and is honestly a superior product to Office. They are providing a viable (superior) offering to Microsoft near Monopoly power so are providing a valuable service.

The Gbiota club is a child of the internet and I see these organisations providing an excellent model for Gbiota to follow.

Accidental adoption

I am just a humble engineer who had the good luck to stumble upon computers at their birth and had hidden skills in numerical methods and computer simulation to earn enough money to spend the later years of my life exploring technologies that both interested me and I felt were socially important.

There is no doubt that the Wicking Beds technology I pioneered over twenty years ago has enabled people with very limited space or resources to grow foods that will make them healthy and are they now universally used - even though the technology has been corrupted losing the simplicity and economy of the original concept.

My latest technology - the Gbiota beds is aimed at enabling small (or even large) scale commercial growers to supply food of the required quality to provide healthy food for the bulk of the population. Currently it is working fine on a small scale.

My studies into how to reverse diabetes - although largely based on technology already in the literature - but reinterpreted from the view of thermodynamics could benefit millions of diabetic sufferers.

So technically I can reasonably claim success as a technologist and an innovator.

But it does not matter how good the technology is - it is of no value if it is not used and applied successfully.

What is the level of success with applying these technologies?

Wicking beds have achieved universal adoption so appear successful but the process of adoption has been totally disorganised with no real control of the integrity of the technology. To be fair I developed Wicking Beds before the internet was widely available and I - and most people - had no idea of the coming social revolution which has literally changed the world.

I formed the Gbiota club as a way of introducing the technology in a more controlled way but there are three factors which affects its future all tied to the fact that I am approaching becoming eighty years old.

Facing the realities of ageing

The first is that as you get old you become more realistic about your abilities. I cannot fail to see that I have a very ragged capability profile. It would be inconsistent with the facts and false modesty to deny that I do have skills in engineering and technology.

It would be equally unrealistic for me not to recognise that I have a distinctly obsessive character and fanaticism for technical details which means my marketing skills are very much at the bottom of the pile. Although over my life my technical ideas have achieved significant adoption it is because other people have seen the value in the technology and promoted it - successfully - on my behalf.

I am fully aware that for Gbiota beds to achieve the widespread adoption they deserve - I need to work with people who have skill sets which are complementary to mine - particularly in the field of internet marketing.

I need to become part of a team.ⁱ

The second is simply time - I spend hours searching the web, reading technical articles and books and I do have a diabetic wife to care for. For example I have been collecting a data base of plants with useful health benefits - I just don't have the time to work on this as a publishable document.

The third is simply that no-one lives for ever. If I were to die tomorrow my web site would close down and everything would simply stop. I think what I am trying to do is socially

important and when I stare up from my compost pile I would like to see my work carrying on.

I have a company Cohort International Pty Ltd - I would like to appoint directors to this company so it would take over a restructured Gbiota Club and would automatically continue to operate while I establish relationships with the worms in my composting grave.

The future structure of the Gbiota club

Club coordinator Well I am not dead yet and am feeling healthy so I will give myself the title of Gbiota Club coordinator. This at least indicates that this is a flat organisation without the conventional hierarchy.

Marketing manager We need someone with the skills and experience in internet marketing who can promote the club and attract new members. In a company they would be called the marketing manager although whoever wants to take on the job can create their own title.

CEO We need someone who can take on the administration of the operation. If, as I hope we are successful in attracting commercial growers, we would need to ensure that they were providing food that the customers expect from a Gbiota supplier and conform to the clubs standards. Gbiota is a registered trade mark and they would need a license to use that name - which could become a valuable asset.

In a company this would be the job of the CEO Chief Executive Officer

CFO We need someone who in my old company we called the gofer (go for this go for that) and basically make sure things get done. But if I were to join John Cleese's dead parrot this operation would have to become self-funding. At this moment I pay all the bills as they come in but the whole operation would change when I become compost so we need someone to keep the financial wheels turning smoothly.

What's next

I you are still with me after all these pages you may be wondering what to do next.

The Gbiota club - is to spread the information anywhere and everywhere in the world to people to anyone interested in improving their health.

If you think you may be interested just email me colinaustin@bigpond.com

Part 4 Useful resources

I have written extensively on my web site with all the files listed in the library section but as it may be a bit much for most people I have selected the more important articles.

<http://www.waterright.com.au/Gbiota%20thinking.pdf>
<http://www.waterright.com.au/manifesto.pdf>
<http://www.waterright.com.au/honest%20food.pdf>
<http://www.waterright.com.au/Reversing%20Diabetes%20and%20gut%20biota.pdf>
<http://www.waterright.com.au/summary.htm>
<http://www.waterright.com.au/choice.pdf>
<http://www.waterright.com.au/sadtale.pdf>
<http://www.waterright.com.au/diabetesandecovillages.html>
<http://www.waterright.com.au/GutivarsStike%20Back.pdf>
<http://www.waterright.com.au/PreventingDiabetes.pdf>
<http://www.waterright.com.au/gutbfood.pdf>
<http://www.waterright.com.au/vision.htm>
<http://www.waterright.com.au/Shanghai%20Wuhan%20talk.pdf>

There are an overwhelming number of qualified doctors and researchers in the field. These are people who really are a must see.

Jason Fung
Michael Mosley
Roy Taylor
Ted Naiman
Zack Bush
Gary Taubes
Nina Teicholz
Alan Goldhamer
Michael Greger

These are equally important workers in the field

Neil Barnard
Mark Hyman
Valer Longo
Kim Ivor Cunnubs
Eric Westman
Zoe Harcombe
Benjamin Bikman
Paul Mason
L. Amber O'Hearn
Feng-Yuan Liu
Georgia Ede
Robb Wolf
Ken Berry
Michael Eades
Andreas Eenfeldt

Stephen Phinney
David & Jen Unwin
Magan Ramos
Robert Szabo
Catherine Croft
Christopher Webster
Nadir Alia
Anthony Hadj
Joel Kahn
Susan Levinne
Gemma Newman
Rob Atkins
Dean Ornish
Andrew Freeman
Pat McAuley
Jeanne Schumacher
Mariana Mendibla
Martica Heaner
Michael Klaper
Pamela Popper
Susan Levin
Cyrus Klambatta
Robert Osteld
Hana Kahleova
Brenda Davis
Joanne Kong
Szannah Bozzone
Chatterjee
Joe Fuhrman

They are easy to find on the web - I like to watch YouTube presentations as the discussions between the experts are particularly revealing. Despite the heated arguments they all seem to agree that food is critical to health and we eat too many macro nutrients and not enough micro nutrients.

Also see

<https://www.healthline.com/nutrition/microbiome-diet#bottom-line>

<https://www.healthline.com/nutrition/gut-microbiome-and-health#section4>

The END

