

Gutivars strike back

- screenplay for a film by Steven Spielberg

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Gutivars strike back - the screen play

Scene 1 Austria 1920's

*Note this is the intro-frontal flier before the titles like in James Bonds films.
(filmed on location in Austria)*

The first scene starts in a beautiful little Austrian town in the 1920's where a couple of scientists are developing what must be among the greatest scientific breakthroughs of all time - how hormones control our bodies - a breakthrough which could save millions of people from dying from heart attacks or being debilitated by diabetes.

(computer animation humorous)

They had a model *(simplified cartoon for the film)* that inside our guts was a little man, who was actually quite smart, who would inspect a piece of incoming food and decide what to do with it.

He had several levers - if he decided the food was full of energy - like a piece of cheese cake - he may pull the lever which would direct the energy into the blood stream so the poor person on the outside would become like an overexcited kid at a birthday party racing around like a maniac.

Or he may decide that he needs to store the food so he pulls another lever so the cheese cake goes into the 'store room' as tummy fat.

Or he may decide the food is crap so he pulls a third lever which sends it off to the pipe where it actually does become real crap.

(voice over)

Ninety years ago they had worked this out. There was no little man - it was done by our guts making chemical hormones. What they had not worked out - and we still haven't - is how the little man decides which lever to pull.

They published this - but not in a well-known science publication - more like the Germanic equivalent of a local newspaper - such as our Upper Yarra Gazette which is full of adverts about how Mrs Schmitt's cats has had kittens which are for sale for 5 pfennigs each, that Hans can mend your leaky tap and Fritz can cut you lawns.

Then Hitler's offsidiers decided that these scientists should not be wasting their time on silly stuff like stopping people dying from heart attacks when they are going to shoot these people anyway. No instead they should do something useful like joining the army and killing people who did not have blonde hair and blue eyes.

So this monster breakthrough in science was almost lost - until some Hungarian guy in New York in 1950 finds a copy of this local rag and all is saved.

Yes it is true - not just the film.

Scene 2 Mao's China in the Cultural Revolution

Now Spielberg does one of those instantaneous changes of scene to China in the Mao era.

People are starving to death - (no one seems to know for sure how many people die in the great famine - estimates vary from twenty to sixty million - but big).

Spielberg shows this by dead bodies in the street and starving peasants exchanging dead babies for food.

(It seems that people will do almost anything for food when they are starving but they just cannot bring themselves to eat their own dead child - but they will trade).

Spielberg does a really dramatic job on this - and the next shots are of the Red Guards terrorising people. Then a dramatic piece as a young girl - just a young teenager - is separated from her parents and family and bundled into a cattle train for the four day trip to Xinxiang (near Mongolia) leaving her mentally scarred for life.

(This is real and her name is Xiulan Tang.)

But Spielberg wants to show the resilience of people - whatever they suffer - and she qualifies as a Doctor and in later life becomes a respected surgeon at a leading hospital in Shanghai.

Scene 3 Modern China

*Unfortunately Spielberg selects some doddering old actor from the retirement bin to play the next character - Colin Austin.
Set in Chinese hospital Shanghai.*

He is searching for some traditional Chinese remedy for his collapsing knee. He is a virtual cripple.

He fails to find a traditional Chinese remedy and undergoes the knife to end up with a high tech foamed titanium artificial knee - and a wife - Xiulan.

Scene 4 Super market in Modern Australia

Colin and Xiulan came to Australia.

Sad to say the hardship of her early life and deprivation of food has not prepared her for the abundance of food on Australia - scene with Xiulan in a supermarket drooling over the abundance of food with a quick flash back to people starving in the streets in the China of her childhood. You have got to admit this Spielberg guy knows his stuff.

She loves the abundant, tasty and easily prepared processed food and within two years developed type 2 diabetes. It is obvious if they are going to solve her diabetes they need the skills of a food psychologist.

(Colin has never got used to have a chicken head floating in his soup and Xiulan really has problems eating any food which is no cooked - changing diet is not easy).

Scene 5 Australia Doctors surgery

Xiulan and Colin coming out of the doctors having just been told she has become a type 2 diabetic.

Scenes 6 to 8

2 years later various medical specialist consulting rooms

The next few scenes are short and powerful. She begins to lose her sight - as a result she falls down a flight of stairs breaking multiple bones in her foot. At first it heals then starts to turn black. They are faced with the threat overhanging all diabetics - becoming a blind limbless torso.

The scenes follow them from specialist to specialist each one telling them a different story.

The surgeon who was advising them on her foot recommended a series of cortisone injections. Another specialist advises against saying it would increase her blood sugar levels. Colin tries to get their opinions on diet but none of them would enter into a debate on low carb or low fat diet - they say just continue to eat normally and continue with the pills.

Colin gets seriously marked as everything he has read said that diet was the most important weapon in fighting diabetes.

Spielberg does some nice touches with snatches of Avatars after each visit to show that they are just progressing through an automated machine with no real idea on how to resolve diabetes.

Spielberg gradually builds up tension for the last consultation - which is about diet.

The dietician tells them that diabetes was irreversible - Xiulan would steadily get worse, needing stronger and stronger medicine until she would need to inject insulin and she should accept that she would die young.

The dietician makes it very clear - **That the way of the world - get used to it!**

This is one scene where Spielberg got it wrong. He should have had Colin played by Russel Crowe rather than some geriatric actor.

He thumps the table at the severely frightened dietician saying that diabetes is caused by diet therefore it should be cured by diet and as he leave he shouts 'and he is going to find out how'. *(strong anger)*

Spielberg does have a nice touch of the dietician crying in her office after they have left saying to her nurse 'he is right we just don't know how to help these people'.

Scene 9 driving home setting up scene for flash back

The next scene is the lead up to a monster flash back - they are driving home talking

Colin - 'we are victims of the Silo effect'.

Xiulan - 'my English not welly good - what this Silo effect?'

Colin - 'it is where a lot of very clever people all work in there little area without really understanding how they all link together. In engineering we used to call it cardboard box engineering where each engineer works in his own little box but not paying attention to how the final product will work as a whole - my favourite term was dead cat engineering'

Xiulan - 'you want me eat dead cat - if it make me better I do'

(Actually Xiulan is 65 and talks quite normally but Spielberg insisted they have a sexy young Suzie Wong type actress with a silly pseudo Chinese accent to play the role).

Colin - 'no dead cat or over the wall engineering means you do your job then throw the dead cat over the wall to the next group - it is a no longer your problem so it becomes a dead cat.'

Xiulan - 'can you kill dead cat for me - me don't want to go blind and have legs chopped off'

Colin - 'let me tell you a story about when I was young'

Scene 10 flash back forty years Detroit USA General Motors conference room

Spielberg now does a flashback almost forty years; Colin has set up his computer aided engineering company and was giving a lecture at General Motors on how to use his software.

There is a bunch of engineers sitting in a conference room while he is lecturing. Spielberg gives every engineer a thought bubble coming out of his head to show what they are thinking.

They have obviously been told by their boss to attend but they think the whole thing is a waste of time so they are not paying attention and their minds are wondering off.

Some thought bubbles show the engineers are thinking about golf or sports cars and one younger engineer is having not totally appropriate thoughts about a young female trainee engineer in the front row.

None are really thinking about the course content but they listen passively while his words float past them. But gradually Colin brings up concepts which show them that they - highly experienced engineers from one of the world's largest engineering companies have been doing somethings wrong.

The thought bubbles change from passive indifference to anger - we see thought bubbles of lions tearing him to shreds, of him being dropped down wells and them inflicting other terrible tortures on him.

But then some of the thought bubbles change again as they begin to get the new concepts and could see he may actually be right. One thought bubble was dogs sniffing other dogs to see what they had to offer, the young engineer image changed

from thinking about the young female trainee engineer to lying in bed while a pretty nurse stroked his forehead - he obviously had problems.

Then a senior engineer stopped the meeting and made a little speech. It ran like this -

'look you are standing in what must be the most intensive engineering area in the world (*thought bubbles changed to the thousands of large and small factories in the area*) we have some of the best research labs and Universities which are leading the world in many areas of technology (*thought bubbles changes to flash labs with electron microscopes*) yet you come from Australia (*he said it twice*) Australia (*and all the images changed to kangaroos hopping down the high street*) and you are telling us that we have been doing many things wrong and we need to change the way we do things'.

He then said in quite a friendly non aggressive way

'Are you some kind of maths genius or something?'

Russel Crowe (*or whoever was playing him now had to act as though this was one of the most important moments of his life - because it was*) - if he could pull this one off and win General Motors then he could go from success to success but if he goofed it could mean the end for his company.

Colin - 'Look how technology works - we have here a very complex problem with multiple areas of technology, we have heat transfer, fluid flow, a material with complex flow problems, we have very complex geometry we have to describe to the computer, we have some areas where there is simply no way of knowing the answer like what happens to flow when there is a change of section - we just don't know all the answers'

A little pause for this to sink in and watch the thought bubbles as they reflected on how difficult their jobs really were.

'I know that within your company you have experts in all these areas - I also know you have almost unlimited money so can go out and hire any expert you wish and the simple fact is that every expert will know more about their particular area of expertise than me - that's just a reality'.

The thought bubbles showed they agreed - they did have all that expertise but he still had not answered how come a guy from Australia was standing in front of them telling them - the experts - how to do their job?

Colin - 'Let me tell you a story - when I graduated as an engineer and started working I had to undertake shop floor training spending a few weeks in every department learning how they did their job and hopefully pick up some practical skills. In every shop I worked they had coat hooks made using the skills of that department. The fabrication shops had bent steel, the pipe shop used pipes, the pattern shop used timber and the foundry had cast iron.'

Every specialist will look at a problem from the viewpoint of their particular speciality and the more skilled and the higher the level of speciality the more they are locked into that way of thinking.

I have tried to acquire a basic competency in all these many areas and I will admit that in some I have only just barely competent.

Look to solve the problem we need to solve partial differential equations, the French Mathematician Fourier worked out the principles of solving all these equations over two hundred years ago - but he never solved them.

That needed skills in numerical methods. Newton was the leading expert in numerical methods but he did not solve them either - he knew exactly how to but didn't have a computer.

I saw that now they had developed computers that I should be able to solve these equation - and I did solve these complex equations - and sure I got answers but when I got together with some of my mates in industry and tested them out on the shop floor the answers were terribly wrong - I had errors of factor of ten. I checked and double checked and decided I had not screwed up on the maths.

So I went back and rethought some of the engineering assumption I had made - things there was no way of calculating so I just made up formulae which I thought would work - but didn't. So I kept on changing these made up formulae until they gave useable answers. Somethings in life are so complex you just have to use empirical methods - that's OK as long as you test them under real world conditions.

There is really nothing world shatteringly new in what you are seeing today - it is the result of many other very clever people's ideas but integrated into a working system that has been testing out in real world conditions.

I call this integrative technology - bringing together very different technology so 2 plus 2 makes 5. It is a very powerful approach but there are always holes between the technologies so you must be prepared to fill these holes with empirical technology and then test the entire system is working as a whole'

This is a key part of the film so Spielberg has the GM engineers discussing this so the audience gets the point.

Scene 11 Company history and take over

Spielberg really want to make a point that integrative technology really works so he does a flash back on Colin's company to show there are alternative ways of conducting science. He does this by an interview with Colin by a young reporter (pretty girl obviously - this is entertainment). There is a series of old pictures in the background to add punch to the story).

Colin - 'Believe me I have not always been old and many, many years ago I lectured at a local university and discovered early computers. They were operated by punch cards which may even challenge the young kids with their smart phones. (I get my granddaughter to teach me.)

But I was hooked and could see that computers were going to revolutionise engineering - my profession. I mortgaged my house and bought a microcomputer (the second to come into Australia and well before Bill Gates) and started to cut code.

I formed a company (Moldflow) which I ran on the basis of integrative technology. It became the most successful exporter of technical software from Australia and was eventually snapped up by one of the US software giants for half a billion dollars.

Don't get me wrong I had sold out long before for - just for pocket money - to pursue my passion to the environment particularly soil and water.

There are background picture of developing Wicking Beds to provide sustenance food in Ethiopia

- experts said the water would go putrid but using the principle of integrative technology and empirical testing I made Wicking Beds practical.

I just make the point that that other people are prepared to invest serious money in this process of integrative technology. It is a viable solution to serious problems and how to manage a mix of complex technologies.

Scene 12 - 15 The carb v fat debate

Now Spielberg would get to the main point of the story the battle between the powerful Ancel Keys and his followers and a couple of writers Gary Taubes and Nina Teicholz. This is done by a combination of interviews and presentation of papers at conferences.

Spielberg finds a very clever way of contrasting the methods of the Austrian scientists which focused on understanding the mechanism of how our bodies work but whose work was sadly lost for many years with the epigenetic (looking for associations or correlations without understanding the underlying mechanism) approach of Keys who just looked at correlations and associations and got the wrong answer - but by virtue of his power and position was able to get his views accepted as fact across the entire medical community.

Keys was saying that saturated fats were bad and he may actually have had a point - what he failed to appreciate was that the polyunsaturated and trans fats and a high sugar and carb diet which followed were infinitely worse.

Spielberg has great fun in satirising big food who simply loved Keys's ideas - it meant they could make mega bucks selling food which was much cheaper to produce.

He would also have fun showing how Big Food was using exactly the same techniques as the tobacco industry of creating doubt on established science by funding research by prominent scientist that would cloud the issue and lead to confusion. He does this by flashing between some of the old adverts for tobacco and more recent ones for so called energy foods.

Scene 16 the red car

This scene has two scientist talking with flash backs

Scientist 1 - 'You know we are really just chasing symptoms'

Scientist 2 - 'No we are making great progress - look at what we have achieved with DNA sequencing and genomics - fabulous stuff'

Scientist 1 - 'Did I ever tell you about Dumbastien in Europe. The police noticed that there speeding cameras were catching far more red cars than grey one'.

(Flash to two speed cops talking and catching cars for speeding')

Well the set up a review to work out why and they did all sorts of tests comparing the performance of red and grey cars.

(flash to speed test of red and grey cars - identical apart from the colour)

They could not find any difference but the Government decided to put a 50% tax on red cars anyway. The only difference it made was a big jump in the sales of red cars and more were caught speeding than ever.

Well the real reason was that young men thought they had a better chance of picking up girls in a bright red car and driving fast.

(flash to young hoones doing wheelies in a Super market car park egged on by a bunch of girls in ultra-low tank tops and miniskirts)

You see they were just chasing symptoms with absolutely zero effect. We are doing the same. We run around saying that getting fat causes diabetes - but there are plenty of fat people who are fit and never get diabetes. It is just a symptom of something deeper.

People get fat because the little men with levers push them to store fat.

(flash back to opening scene of Austrian scientists)

We know that excess insulin makes people fat and can also cause insulin resistance which we see as diabetes. But these are just symptoms not the real reason. We have absolutely no idea why in some people the little men work their levers to make people fat and give them diabetes while with other people - whatever they eat has absolutely no effect. We are just chasing symptoms.

Scientist 2 - 'That's over the top - we have identified exactly the types of bacteria in fat people and diabetics - we have done a great job with our DNA modelling. And look at what we have done with faecal transplants we can easily make fat people thin - it is one of the most successful medical procedures.

Scientist 1 - 'I agree we know that it works but we still don't know the real reason why it works and you can't go and give faecal transplants to some billion people - there is just not enough good quality poop. We know people are getting fat because of a change in our food system - we just don't know the real reason why - and until we find out we will never solve the diabetes epidemic.'

Scene 17 Selling the next film

But of course Spielberg is not just a master story teller - he is master of setting up the end of his current film leaving the audience impatient for his next master piece.

And has he got a golden opportunity? Voice over

In many ways Gary and Nina may won the obvious battle between carbs and fats but have lost the main battle on scientific processes. They were attacking the scientific

processes that led to the denunciation of saturated fats. They won the saturated fat battle and now there is an ever increasing trend to the keto or high fat low carb approach - even Bill Clinton has swopped over.

But the real point of Nina's book (The Big Fat Surprise - Nina Teicholz) was to criticize the scientific process that led to the mistaken conclusion that fats were bad rather than simply fight the low fat brigade.

And the anachronism is that the high fat brigade seems to be adopting the same procedure that Nina and Gary have criticised - they may or may not be getting the right answer but they are getting there on the wrong road.

Even if the high fat brigade is technically right it still won't solve the global diabetes problem. There is just not enough saturated fat in the world to feed seven billion people.

Just being technical correct is not enough. It is fine for a few wealthy people to eat goose liver and pheasant's eggs. Any solution must involve big food and change the food system.

Spielberg is no fool - he didn't start his film with long forgotten Austrian scientist without a good reason.

Those early researchers appeared to fully understand that our guts decide what to do with the food as it passes through our internals. What the guts decides depends on how people react to their food - some people can tolerate tons of fats others can tolerate tons of sugars and carbs and it all depends on what our guts decide.

Everyone's guts are different and take different decisions even when faced with the same food - that's why some people die of heart attacks, others get diabetes and others seem immune. It also explains why the correlation coefficients in the epigenetic trials are so low as to be almost meaningless.

It is going to be a long time before we understand the complexity of how the trillions of microbes in our guts work together to create an intelligent system - we know they do but not how they do it. Statistically significant and having a real meaning are not the same thing - the number of red cars caught speeding is technically correct and statistically highly significant but total rubbish.

But we can find out - even if empirically - how to change our guts so they take good decision that benefit our health.

My comments on the film

Nina book was really about the scientific method. There is no doubt that the reductionist approach of modern science has given us amazing benefits in many areas. For example the ability to identify gut biology by DNA sequencing will turn out to be a major benefit.

But at the street level - what matters to ordinary people - the classic approach to managing diabetes has been a failure with immense consequences.

As I trotted around from one specialist to another trying to learn about diabetes that is exactly what I found - no doubt they were all super competent in their respective fields but there was no one of average competence looking at how everything fitted together.

There is no doubt that diabetes is caused by inappropriate diet so it a pretty fair bet it can be cured by diet. I have spent the best part of ten years following the argument about what is the right diet and I can tell you it is a total shambles which defies all scientific processes.

My explanation is that they are missing one key factor - our bodies are not some dumb machine which we pump food into. Our guts are a highly intelligent system - you take billions of cells all communicating together and they naturally form an intelligent system which takes decisions based on the information supplied.

In my last message I talked about the dangers of fructose in processed food and was told I had the story wrong and that even fructose in fruit was just as bad. This could end up as a futile debate if we just think of our bodies as a dumb system. But if we think of our guts as an intelligent system the argument never even starts.

One set of guts could look at fructose and decide that this needed to be sent to the liver and converted to fat which would lead to an escalating disaster starting with obesity, insulin resistance, diabetes, blindness and limbs being chopped off. Another set of guts could say this is crap and it belongs in that tube over there and down it goes and that lucky owner lives happily ever after.

The point is not to argue over which diet is best but how to use diet to change our guts so they take the right decisions for us.

Now at the start of the Gbiota project I had a hunch that the key to changing our gut biology was to focus on the route that the biology took from the soil through the plants and into our guts. Now this may seem a little silly as the type of biology in the soil is different to human guts.

But although a bit silly in theory I thought that it was worth pursuing and then I find a paper in Science from a researcher in Scotland who was saying that plants have a biome in a similar way to humans, another paper I find shows that soil macro creatures - which have guts like us - can attack the roots system and pass on their biology to the plants. This does not prove that eating plants grown in biologically active soil will change our gut biology and improve our health but it certainly encourages us to undertake the experiment.

It pays not to reject ideas too early - even if they sound a bit silly.

It is well within the capacity of the Gbiota club - who are largely gardeners - to grow plants in biologically active soil and see how it changes our gut biology and health for the better.

This could be looked upon as a proof of concept - if we can get to that stage then we can show there is practical benefit in changing human gut biology by managing soil biology then it is almost certain that the professional researchers would take up this project with all their specialist skills and equipment.

Citizen research doesn't have the constraints of professional researchers - they don't have to spend their time on applying for grants and conforming to the rigid discipline of science - they can just get on pursuing ideas that may be high risk but have high

rewards. That is why the Gbiota club has the chance of making a major contribution to the diabetes battle.

It may not be classic science but I think that a bunch of dedicated people working together and sharing information could find out how to develop a healthy gut just by eating food grown in a health soil and I think this could make a major impact on the fight against diabetes and the other chronic diseases. It is hard to put 'diabetes' and 'advantages' in the same sentence so I will use the term 'facilitating factor'.

It is difficult and dangerous for a group of citizens to conduct experiments on heart disease it is simply too risky. But diabetes has one 'facilitating factor' - you can measure progress simply by monitoring blood sugar with minimal risk.

It is even easier if the aim is simply to combat chronic diseases in a general way - all you need is a tape measure and a set of scales and become sensitive to your general energy levels.

That is why I want to form the Gbiota club. I hope the message is now clearer and look forward to your email saying you want to join - colinaustin@bigpond.com