Diving Towards Danger Point

'Supermassive Black Hole' vs Supermagnetic Field

Banishing Glyphosate

How China's Food Policy Devastates People & Planet
International NGOs called for China to stop producing glyphosate

In the wake of the World Health Organization reclassification of glyphosate as “probable carcinogen”, an international group of non-government organizations (NGOs) sent an open letter to China addressed to the Chinese people, Chairman Xi Jinping, and Premier Li Ke-qiang, calling for an end to the production of glyphosate on grounds of its carcinogenicity and other serious toxicities (see Ten NGOs Ask China to Stop Producing Glyphosate to Protect World Health, SiS 66). By the time it was translated into Chinese and posted, another 7 NGOs had signed the letter, which was widely read and reposted, receiving a great deal of support in China (http://blog.sina.com.cn/s/blog_4bb17e9d0102vkio.html).

China indeed holds the key to the future of glyphosate, by far the world’s top herbicide, used for weed control not only on farms growing GMOs, but also as desiccant on non-GM crops, and in residential and commercial areas of cities and towns, in parks, and home gardens, based on false claims perpetrated by Monsanto aided and abetted by regulators that it is harmless to humans and animals, even in the face of overwhelming evidence to the contrary (see A Round-up of Roundup Reveals Converging Pattern of Toxicity from Farm to Clinic to Laboratory Studies, SiS 65).

By the beginning of 2015, China already owns 70 % of global glyphosate overall production capacity, currently in excess of 800 000 tonnes. China’s glyphosate output has been rising rapidly in recent years, increasing by some 20 % in 2013 to 509 000 tonnes, of which 442 000 tonnes (over 80 %) were exported, while domestic

China is world’s largest glyphosate producer & exporter by far and growing

China is the world’s largest producer of the herbicide glyphosate. By the beginning of 2015, China already owns 70 % of global glyphosate overall production capacity, currently in excess of 800 000 tonnes. China’s glyphosate output has been rising rapidly in recent years, increasing by some 20 % in 2013 to 509 000 tonnes, of which 442 000 tonnes (over 80 %) were exported, while domestic
consumption remained at about 50,000 tonnes.

Wang Jian-wo, secretary general of the Hunan Provincial Agricultural Pesticide Industry Association said China has captured over 50% of the world market for glyphosate, but less than 20% of the high value-added glyphosate formulated herbicide market share; this puts China’s glyphosate industry at distinct disadvantage. “It suffers from serious excess production capacity, inability to compete, and lack of control of the situation.”

According to Zeng Jun-zhen, Chairman of Xingbang Science & Technology Incorporation, more than 80% of China’s glyphosate is exported to just 6 countries, with the top three (USA, Brazil and Argentina) accounting for 55-60% of China’s total export.

As regards formulated glyphosate herbicides, Monsanto has assigned China Chemical International Group exclusive distributor rights for Australia and New Zealand in 2013. Since then, China has also acquired exclusive distribution rights for Monsanto’s Roundup herbicides in 6 nations of the Far East - India, The Philippines, Thailand, Vietnam, Pakistan and Bangladesh – and the sales of glyphosate in 2014 reached a historical high, increasing by 7.11% over the previous year.
Currently, 35 species of weeds are resistant to glyphosate in 25 countries around the world; 14 in the US, 10 in Australia, 7 in Argentina and 6 in Brazil

In recent years, China has implemented a series of pesticide administrative policies aimed at concentrating production, and increasing competitiveness and sustainable agrochemical development. As a result, some medium and small enterprises have shut down in 2013, being replaced by bigger companies. By the end of 2013, 17 companies were producing 647,000 tonnes of glyphosate, and the capacity is still expanding.

At the same time, China is aggressively increasingly its international market share. In 2013, Sinochem obtained Monsanto’s dealership of Roundup in Australia and New Zealand. In 2014 Huapont-Nutrichem invested 1.4 billion Yuan in the US Iowa-based company Albaugh, paving the way for Huapont-Nutrichem to enter the distribution channel of the world second largest glyphosate supplier. Also in 2014, Hubei Xingfa Chemicals Group acquired glyphosate enterprise Taisheng, planning to set up a direct glyphosate sales channel in Brazil; and Rainbow Chemical has released glyphosate GR (granules) to the South American market including Argentina.

Phenomenal growth of China’s soybean imports & grain self-sufficiency

China is a country of origin for soybeans and had been producing all it needed up to 1995. But since then, soybean imports into China had seen a meteoric rise, from 1.1 million tonnes in 1996 to 71.4 million tonnes in 2014. How did that happen?

According to veteran world watcher Lester Brown, it goes back to 1994, when he published an article “How China could starve the world” on the front page of the Washington Post’s Outlook section, and unleashed a “political firestorm” in Beijing. A press conference was held at the Ministry of Agriculture, where Deputy Minister Wan Baorui denounced the article, saying that advancing technology would enable the Chinese people to feed themselves. A stream of articles followed that challenged Brown’s findings.

Nevertheless, in assessing the situation, the Chinese Party leaders decided to redouble their effort to maintain grain self-sufficiency, a policy that had preoccupied the leadership since the Great Famine of 1959-61 when large numbers of people starved to death. In order to concentrate efforts and resources on grain, they decided to abandon self-sufficiency in soybeans, even though China is a country of origin for soybeans. The effect was dramatic. In 1995, China pro-
Glyphosate resistant weeds are intensifying global problem

For some time now, the issues of glyphosate resistant weeds and glyphosate safety have been bringing China’s optimism for the herbicide, as a trend watcher commented. The International Survey of Herbicide Resistant Weeds lists (21 May 2015) 246 species of weeds resistant to 157 different herbicides globally, affecting 86 crops in 66 countries. Currently, 35 species of weeds are resistant to glyphosate in 25 countries around the world; 14 in the US, 10 in Australia, 7 in Argentina and 6 in Brazil. Glyphosate resistant weeds have emerged rapidly since the introduction of genetically modified glyphosate tolerant crops (see Figure 2). GM crops are the single most important factor for the increase in glyphosate use and the consequent emergence of glyphosate resistant weeds. By the end of 2012, 61.2 million acres (49 %) of crop lands (corn, cotton and soybean) in US are infested with glyphosate resistant weeds, up 51 % over 2011. The number of farms with two or more resistant species in increasing; in 2010 it was just 12 % of farms, two years later, it was 27 %.

So far, there is no satisfactory solution to glyphosate resistant weeds. Experts suggest using glyphosate with other herbicides, planting glyphosate resistant crops in rotation with normal crops, as well as multi pesticide-resistant stacked trait GM crops. However, multiple herbicide-resistant weeds are already common, including those resistant to glyphosate. The use of multiple pesticides and multi pesticide-resistant stacked traits would make matters worse.

Safety issue may be the tipping point

The only safety issue mentioned in the trend-watcher comment is the fatal kidney disease epidemic that has hit some countries using glyphosate including Sri Lanka and El Salvador (see Sri Lanka Partially Bans Glyphosate for Deadly Kidney Disease Epidemic, SiS 62). Of the countries involved, El Salvador has imposed an outright ban, in 2015. Sri Lanka soon reversed its ban due to pressure from industry; but its new president has just announced a ban on import of glyphosate with immediate effect, while bans in Argentina and Brazil are still pending.

The trend-watcher comment was made four months before the WHO reclassified glyphosate as a probable carcinogen (Glyphosate **Probably Carcinogenic to Humans**” Latest WHO Assessment, SiS 66); which has unleashed a fresh round of demands for bans from authoritative organizations worldwide as well as actual bans on glyphosate. The fallout is substantial (Fallout over WHO Classification of Glyphosate as Probable Carcinogen, SiS 67), and yet to be played out. It may well be the tipping point for the herbicide that has so rapidly attained world dominance over the past two decades.

Glyphosate producers should take prompt action to divest into supporting truly sustainable agriculture, beginning with the remediation of glyphosate contaminated fields and water, an increasingly active field of research as the toxicities of glyphosate for people and planet have become all too evident.

China also needs to seriously rethink its food security policy in line with those of the rest of the world (see for example Food Futures Now *Organic *Sustainable *Fossil Fuel Free, ISIS/TWN special report; Agriculture beyond the Green Revolution: Shaping the Future We Want, SiS 64): especially a shift to sustainable, organic non-GM agriculture, reducing meat consumption, focussing on developing extensive grass-fed livestock for healthy meat, and re-instate soybean self-sufficiency as part of food self-sufficiency.

I thank Chen-I-Wen, former advisor to the Committee of Disaster History of China Disaster Prevention Association, who provided key information for this article.

Fully referenced versions of all articles including this editorial are available on ISIS members website.
Banishing Glyphosate

Glyphosate/Roundup, falsely claimed by Monsanto to be safe and harmless, has become the world’s most widely and pervasively used herbicide, especially with glyphosate tolerant GM crops; it has brought rising tides of birth defects, cancers, fatal kidney disease, sterility, and dozens of other illnesses. Read the devastating evidence & ban glyphosate herbicides from you home and local community

Dr Eva Sirinathsinghi & Dr Mae-Wan Ho with Dr Medardo Ávila-Vázquez, Dr Don M. Huber, Dr Rosemary Mason, Ib Borup Pederson, Prof Peter Saunders, & Dr Nancy Swanson

What Banishing Glyphosate says

- We must banish glyphosate herbicides for their harm to people and planet
- Glyphosate herbicides exert multiple modes of toxicity that include the potential to cause cancer, birth defects, renal failure and dozens of other human diseases; they also poison livestock and wildlife, kill beneficial microorganisms in the soil and promote the proliferation of crop pathogens
- Evidence of toxicity has existed for 30 years but was buried by industry with the help of corrupt regulatory agencies in the US and Europe
- More and more national, regional, and local bans on glyphosate use have been imposed all over the world in face of incontrovertible evidence of harm
- Direct action is in order to push for local, regional and national bans as well as an outright global ban of the chemical.
- Sustainable agro-ecological farming must now replace the chemical industrial treadmill that has been foisted on farmers across the world.

Glyphosate, the most popular herbicide in the world, is a flagship product of Monsanto, and the symbol of industrial agriculture. The meteoric rise of glyphosate use is directly linked to the cultivation of GM crops; glyphosate therefore represents all that is wrong with this agricultural model. Use this report to campaign for a ban on glyphosate and a shift towards sustainable, chemical free farming systems that allow both people and planet to flourish.

Glyphosate was released as an herbicide in 1974, and rapidly became the world’s most popular herbicide especially since the introduction of genetically modified (GM) glyphosate-tolerant crops in the 1990s. Currently, 85% of GM crops are glyphosate-tolerant, with glyphosate-tolerant crops making up the vast majority of those planted. In the US for example which is the largest producer of GM crops, 93% of soybean and 85% of maize crops are glyphosate-tolerant.

A total of 137 glyphosate-tolerant varieties have been approved by May 2015 (see Supplement online Table 1 Approved glyphosate tolerant crops). There are 19 varieties of cotton, 115 of soybean and 81 of maize; and in addition, 1 wheat, 2 sugar beet, 4 potato, 3 Polish canola, 8 Argentinean canola, 1 creeping bentgrass and 3 alfalfa. 80% of these crops are stacked, containing additional traits such as tolerance to glufosinate and 2,4-D herbicides and/or pesticidal properties. Of the glyphosate-tolerant crops generated, over 99% of those grown belong to only four species - soybean, maize, cotton and canola.

According to the new yearly report from industry funded International Service for the Acquisition of Agri-Biotech Applications (ISAAA), “18 million farmers in 28 countries planted more than 181 million hectares [of GM crops] in 2014, up from 175 million in 27 countries in 2013.” This has spurred huge sales of glyphosate, giving it a market value of US$5.4 billion in 2012 with a total demand of 718,000 tonnes. Globally it is a key ingredient in more than 700 products and is also used to control weeds in gardens, along roadsides in commercial and residential areas, and on millions of hectares of farmland. Its presence is pervasive, in the air, in the soil, in our food and drinking water.

Underlying its success has been the repeated claim that the chemical is benign for human health, that its killing mechanism for plants works via an enzyme that does not exist in animals and is therefore safe for both humans and animals. This claim goes counter to evidence that existed right from the start. Studies revealed both carcinogenicity and teratogenicity as far back as the 1980s, but were buried by industry with the support of regulatory bodies such as the US Environmental Protection Agency and the European Food Safety Authority (see EU Regulators and Monsanto Exposed for Hiding Glyphosate Toxicity, SiS 51).

Meanwhile, overwhelming evidence of glyphosate toxicity across the globe has come to light. Everywhere, people are seeing steep rises in cancers, birth defects and other serious illnesses as glyphosate use increases. The World Health Organisation’s recent re-assessment of glyphosate as a ‘probable carcinogen’ vindicates the evidence witnessed by communities, researchers, doctors and campaigners for many years.

Despite rising glyphosate use and GM crop cultivation, recent data show that global GM crop adoption rates are falling, covering only 3.5% of arable land. The markets of high-adoption rate countries are becoming saturated, while few additional countries have been cultivating GM crops, indicating that nations and farmers are turning their backs on a failing technology. With the rise of weeds evolving resistance to glyphosate, US Farmers reported a decline in effectiveness of glyphosate on almost 44% of acres planted with soybeans in 2012. More than 47% of those acres are in the Corn Belt, which contains the majority of soybean acreage in the United States, followed by the Northern Plains (23%), Delta (11%), Lake States (10%), and Appalachia (9%). The failure of GM crops could also have a major impact on the future of glyphosate use.

With its increasing lack of efficacy on top of the rising awareness of its toxicity, people across the globe are taking action to rid glyphosate from their farms, their food and their land, air, and water. Lawsuits are being filed against Monsanto both in the US for false claims of safety, and in China for hiding the toxicology documents used for registering the chemical in the country. China is the world’s largest producer of glyphosate and the largest importer of GM soybeans (How Grain Self-Sufficiency, Massive Soybean Imports & Glyphosate Exports Led China to Devastate People & Planet, SiS 67); and feelings are running high against both. A recent petition has even gone so far as to call for the complete overhaul of the Ministry of Agriculture, whose Agricultural GMO Safety Evaluation is deemed inadequate for ensuring that “GMOs developed abroad or within China are safe”. It goes on to claim that there has been collusion between them and Monsanto, resulting in the submission of “fake samples”, the carrying out of “false tests” as well as the falsification of “safety conclusions” (see China’s Ministry of Agriculture Accused of Colluding with Monsanto, SiS 67). The ultimate rejection of glyphosate and GM crops by the Chinese people could be a turning point not just for China but the world. Meanwhile in Argentina, a federal judge has accepted an unprecedented class action lawsuit demanding a ban on GM foods and their associated pesticides. Defendants of this case include not only all the major GM crop and chemical corporations, but the Argentine national government and the Federal Council for the environment. Claiming that GMOs contribute to the trend towards monoculture, direct seeding with consequent reduction of rural labour, concentration of profit in fewer producers and impacts of health of rural populations and environ-
ment, the lawsuit demands the passing of a biosafety law, labelling of GM crops, and the remediation of environmental damage such as the soil in addition to the bans.

The WHO declaration may well be the final nail in the coffin for Monsanto’s flagship product, as it has intensified campaigns to ban the chemical. Several countries are already implementing bans of the chemical just 2 months after their assessment was published (Fallout from WHO Classification of Glyphosate as Probable Carcinogen, SiS 67). Sri Lanka, suffering from an epidemic of fatal kidney disease, is the first to declare a complete and immediate ban. Earlier, Bermuda has banned glyphosate imports with immediate effect. And Colombia will no longer use it for its large aerial campaigns to destroy illegal coca plantations, a US-led war on drugs that is displacing Colombian citizens and compromising their land and water supplies. The Ecology Minister of France has ordered garden centres to stop selling it and even private companies are taking the chemical off their shelves. At a scientific UK parliament briefing on the 15 July, the Soil Association called for a ban of wheat pre-season spraying destined for bread after tests conclude that UK glyphosate use has risen by 400 % in the last 20 years. A scientist who had served as an “invited specialist” on the IARC panel said he was in no doubt that glyphosate must be banished from our homes, our cities and fields as a matter of urgency. A global ban is in order; the momentum to do so is already gathering pace. But we must start as individuals, in our family and home, our local communities. Above all, we must take this opportunity to stop poisoning people and planet with agrochemicals and shift comprehensively to sustainable, organic, non-GM agriculture that can truly guarantee food security under climate change (see Food Futures Now *Organic *Sustainable *Fossil Fuel Free, ISIS Special Report).

All chapters in this report (except Chapter 9 by Professor Emeritus of plant pathology Dr Don Huber) are selected from articles published by ISIS online and in print between 2013 and 2015. Chapter 1 is updated and substantially enlarged from A Roundup of Roundup Reveals Converging Pattern of Toxicity from Farm to Clinic (SiS 65) incorporating Chapter 1 of Ban GMOS Now (ISIS special report). Chapter 2 is from Marked Deterioration of Public Health Parallels Increase in GM Crops and Glyphosate Use, US Government Data Show (SiS 65). Chapter 3 is updated from Devastating Impacts of Glyphosate Use with GMO Seeds in Argentina (SiS 66). Chapters 4 and 5 are from Glyphosate/Roundup & Human Male Infertility, Glyphosate & Cancer (SiS 62). Chapter 6 is updated from Sri Lanka Partially Bans Glyphosate for Deadly Kidney Disease Epidemic (SiS 62). Chapter 7 is from Changing from GMO to Non-GMO Natural Soy, Farming Experiences from Denmark (SiS 53). Chapter 10 is from How Roundup® Poisoned my Nature Reserve (Rosemary Mason MB ChB FRCA) (SiS 64). Chapter 11 is from Scandal of Glyphosate ‘Probably Carcinogenic to Humans’ Latest WHO Assessment (Dr Mae-Wan Ho and Dr Nancy Swanson) (SiS 66). Chapters 4 and 5 are from Glyphosate/Roundup & Human Male Infertility, Glyphosate & Cancer (SiS 62). Chapter 11 is from Scandal of Glyphosate Re-assessment in Europe (SiS 63). Chapter 12 is from Glyphosate ‘Probably Carcinogenic to Humans’ Latest WHO Assessment (SiS 66).

We thank all our co-authors who have contributed to separate chapters of this report, adding invaluable personal perspectives and especially first hand personal experiences of glyphosate toxicities.
No to Glyphosate

Fallout from WHO Classification of Glyphosate as Probable Carcinogen

Campaigns to ban and phase out the chemical across the world intensify with major successes

Could it be that the World Health Organisation’s classification of glyphosate as a ‘probable carcinogen’ (Glyphosate ‘Probably Carcinogenic to Humans’ Latest WHO Assessment, SiS 66) will be the final nail in the coffin for the world’s most popular herbicide and Monsanto’s flagship product?

Recent weeks have seen the intensification of campaigns to ban or remove the product as well as lawsuits being filed against Monsanto; in the US for false safety claims of glyphosate, and in China, for hiding toxicity studies from the public. (El Salvador has already banned the chemical though yet to be signed into law, while the Netherlands last year banned private sales. Sri Lanka had a partial ban in place in regions most afflicted by chronic kidney disease that has been linked to glyphosate use (see later)).

For decades, the industry and government regulators have collaborated to bury the evidence for toxicity. Many people have, however, known what is really happening, and they now feel at least to some extent vindicated by the latest WHO assessment (see Glyphosate and Cancer, SiS 62, and EU Regulators and Monsanto Exposed for Hiding Glyphosate Toxicity, SiS 51). More importantly, governments are finally beginning to take action.

Outright bans

Colombia has taken the lead, deciding to suspend aerial spraying of illegal coca as well as poppy plants. The ban is expected to come into effect in a few weeks following a 7 to 1 vote in favour in the National Narcotics Council. The day before the vote, the Interamerican Association for Environmental Defence (AIDA) delivered 24,000 signatures to the Minister of Justice who also chairs the Narcotics Council to push for this decision.

Colombia had been employing US contractors to spray glyphosate for two decades, covering an estimated 1.6 million hectares of land. This spraying for the “war on drugs” has been ineffective in eradicating illegal cocaine production, but has instead caused rising illness in local communities, killed local crops and polluting land and water supplies. Indigenous and Afro-Colombian communities have borne the brunt of the fumigation programs, prompting protests against both coca production and glyphosate use that has been displacing people from ancestral lands. Colombia is not alone. Bermuda, the British overseas territory in the Atlantic also banned glyphosate imports with immediate effect following the WHO assessment, as announced by their Minister of Health, Jeanne Atherden, whose decision was supported by local farmers. The Minister said she believes the “action we are taking today is prudent and in the best interests of a safe environment….Like any area of science, there are competing studies and a wealth of information on both sides of the argument…. I am satisfied that this action is warranted and we are committed to conducting an open and thorough investigation.”

Sri Lanka is the latest country to declare an outright ban with the new president, a farmer and previously the Health Minister, Maithripala Sirisena taking the decision due the epidemic of chronic kidney disease that is afflicting the farming regions of the country.
The spread of kidney disease highlights the wide-ranging toxicity of glyphosate not limited to carcinogenicity. The country’s battle to ban the chemical precedes the WHO declaration, coming after studies by Sri Lankan researchers linked the chemical to hard water, heavy metal contaminants and glyphosate use (see Sri Lanka Partially Bans Glyphosate for Deadly Kidney Disease Epidemic, SIS 62). This prompted an initial ban, which was later restricted to certain regions of the country following intense lobbying. With the government paying for healthcare of over 25,000 residents and supplying them with fresh water, the latest decision for an outright ban could not come soon enough.

Imminent bans, protests, and fresh calls for bans

Brazil is facing growing pressure to follow suit, with the country’s public state prosecutor writing to Brazil’s National Health Surveillance Agency (ANVISA) asking it to urgently re-evaluate their stance on glyphosate and also revoke authorisations on glyphosate-tolerant GM crops. He has even gone as far as launching an investigation into whether regulatory authorisations are legal for the GM crops. ANVISA are stalling their decision however, until the full report by the WHO is published.

In Argentina, 30,000 health professionals belonging to the union of doctors and health professionals (FESPROSA), have come out in support of the WHO decision, claiming that glyphosate “not only causes cancer. It is also associated with increased spontaneous abortions, birth defects, skin diseases, and respiratory and neurological disease.” The statement continues: “Health authorities, including the National Ministry of Health and the political powers, can no longer look away. Agribusiness cannot keep growing at the expense of the health of the Argentine people. The 30,000 health professionals in Argentina in the FESPROSA ask that glyphosate is now prohibited in our country and that a debate on the necessary restructuring of agribusiness is opened, focusing on the application of technologies that do not endanger human life.”

Similarly, the Society of Paediatric Haematology-Oncology (SASHOP) issued a statement calling for an immediate ban of glyphosate fumigation, signed by the President of the Paediatric society Pedro Zubizarreta. They objected to the massive use of toxic products being sprayed in ever increasing concentrations in combinations of both insecticides and herbicides, and being sold as “technological advancements”. They also warned against storing the grains in plastic bags, which leaves grains teeming with aflatoxins, categorised by the WHO’s IARC as a known carcinogen since 1993. Glyphosate has already been previously linked to the growth of these fungi in scientific studies, along with many other crop diseases.

Successful protests in Argentina were also recently mobilised to prevent Dr Medardo Ávila Vázquez from losing his job after the agribusiness-funded university threatened to sanction him for conducting and disseminating studies showing the high levels of cancers affecting his region as a result of agrichemical spraying. These protests are a tribute to his work in exposing the toxicity of glyphosate, as well as the groundswell of opposition to glyphosate spraying in the country despite support by the national government. Local residents are gaining strength to voice their concerns following the WHO news as well as the recent decision by the Ministry of Production in the province of Santa Fe to ban aerial spraying of 2,4-D within 6 km of residents, confirming the health risks of the chemical agricultural system that leaves children covered in chemical and dust particles as they walk to school.

In Europe, the International Society of Doctors for the Environment (ISDE) (an influential body with member organizations in 27 countries) has written to officials at the EU parliament and Commission asking for an immediate ban on glyphosate herbicides and also on insecticides also judged by the WHO to be carcinogens, without exceptions.

Germany’s state consumer protection ministers are calling for an EU-wide ban on selling glyphosate for home use, for precautionary reasons, while the German retail giant REWE has decided to remove all glyphosate from its ‘toom Baumarkt DIY’ store shelves by September 2015.

Swiss companies are following in their footsteps, with Coop supermarkets and Switzerland’s largest retail company, Migros declaring they will both no longer sell any products containing it. A member of the EU commission stated in the 2015 GMO-free conference 2015 in Berlin, Germany, that they will include the WHO assessment in their re-evaluation procedures that is due to be completed later this year. However the corrupt process of reassessment that was led by a consortium of chemical companies (see Scandal of Glyphosate Re-assessment in Europe, SIS 63) means that EU campaign groups will have to push hard to force the EU to have some semblance of integrity in their final decision making.

In Denmark, the Danish Working Environment Authority has decided to follow the WHO decision and has now declared glyphosate a carcinogen, with the expected outcome being a switch to alternative, less toxic chemicals (see Roundup Listed Carcinogen by Danish Authority, SIS 67). The decision is backed by one of the world’s leading toxicologists, Philippe Grandjean, a professor at the University of Denmark where he is head of the Environmental Medicine Research Unit as well as being an adjunct professor at Harvard University. Commenting on the decision he stated, “it is so common a substance – and our use of it is so extensive – that this WHO report must be taken seriously,” while encouraging people to rid the chemical from their homes. With such a decision, it now seems unlikely that the post-harvest spraying of crops for desiccation will go ahead this year, which contributes to it being the most widely used herbicide in the country. This is big news in a country about to face an election, with the highly-respected Professor Grandjean’s media appearances drawing much public attention, leaving little room for industry to defend themselves.

US citizens file class action lawsuits against Monsanto for false safety claims

A group of citizens in Los Angeles County are taking court action against Monsanto for falsifying safety claims that Roundup®...
Roundup Listed Carcinogen by Danish Authority

WHO report links glyphosate specifically to non-Hodgkin lymphoma, a disease on the increase in Denmark; eminent professor of environmental medicine calls on people to ban glyphosate from homes, but stops short of a total ban in the country

Dr Mae-Wan Ho

Glyphosate and non-Hodgkin lymphoma

Glyphosate, the main ingredient in the herbicide Roundup, is now considered a carcinogen by Denmark’s Working Environment Authority (WEA). This follows the recent World Health Organization (WHO) reclassification of glyphosate as probable carcinogen (Glyphosate “Probably Carcinogenic to Human” Latest WHO Assessment, SIS 66).

The WHO group of 17 experts links glyphosate specifically to non-Hodgkin lymphoma, a disease affecting approximately 1,040 Danes each year, and the rate is growing for reasons unknown. The WHO report raises the concern of Philippe Grandjean, professor of environmental medicine at the University of Southern Denmark.

Eminent professor of environmental medicine speaks out

“We know that glyphosate causes cancer in other mammals, but it has not been demonstrated in humans. That is because the effects are not investigated thoroughly enough in people yet. But when we see that other mammals get cancer from glyphosate, we must assume that people who are exposed to the substance can also develop cancer,” Grandjean says.

Glyphosate is used in many Danish gardens to control weeds, and Grandjean encourages people to rid themselves of the agent. “Gardeners should remove Roundup as hazardous waste. Pesticides have often proved more dangerous than we thought, and I do not think they belong in our homes,” he says.

The major use of Roundup however, is in agriculture. Glyphosate is by far the most widely used pesticide in Denmark.

In 2013, 1,389 tonnes of glyphosate was used on Danish soil; it is, for example, permitted to spray grains intended for animal feed up to 10 days before harvest.

“It is so common a substance, and our use of it is so extensive that this WHO report must be taken seriously,” says Philippe Grandjean.

“Big News” in Denmark

“The work inspectors in Denmark listed Roundup as carcinogenic, meaning that they will demand that due care is taken when used, and they will recommend a change to other less toxic chemicals,” comments Danish pig farmer Ib Borup Pedersen, who documented the dramatic change in the health and productivity of his animals as well as the profitability of his farm when he switched to non-GM feed uncontaminated by glyphosate 4 years ago (“Changing from GMO to Non-GMO Natural Soy”, Experiences from Denmark, SIS 64).

“This is Big News in Denmark, where the debate has been quiet for too long,” Pedersen continues, “Now that it has been in the news and it is election-day 18 June, this will fill the minds of the politicians, and I cannot imagine that glyphosate will be accepted for use as a desiccant this harvest.”

“Philippe Grandjean is one of the world’s leading professors on toxicity especially on brain damage due to chemicals.” Pedersen adds. “His appearance is of great importance; nobody in Denmark from the industry has clout enough to go against him, as he is both professor in Denmark and USA, and is widely recognized for his work.”

“We want a ban on glyphosate”

“When the WHO expert panel declares that Round Up is probably carcinogenic to humans, we should of course stop the massive use of Round Up in Denmark and the import of feed that has been treated with large amounts of Round Up,” writes Maria Gjerding, environmental rapporteur for Unity in a press release.

However, a total ban is not necessarily the solution, says Grandjean.

“We face a dilemma. For if we ban Roundup, what is the alternative? I understand the idea of a ban, but other pesticides may be worse,” he says.

Grandjean is not unaware that total bans on glyphosate are already in place or announced in El Salvador, Bermuda, and the latest, Sri Lanka, and proposed in other countries; while a number of partial bans have also been imposed (see Fallout from WHO Classification of Glyphosate as Probable Carcinogen, SIS 67).

Furthermore, over 70% of the world’s food is currently produced by 1.5 billion small family farmers, at least 75% of them according to agroecological principles without chemical input; and sustainable, non-GM organic agriculture is widely recognized as the solution to food security in times of climate change (see for example Food Futures Now *Organic *Sustainable *Fossil Fuel Free, ISIS/TWN special report; Agriculture beyond the Green Revolution: Shaping the Future We Want, SIS 64). Denmark should take this opportunity to shift comprehensively to non-GM, organic, health-enhancing, sustainable and climate-friendly agriculture.
Independent Scientists Call for Halt to Glyphosate-Spraying

Scientists and medical professionals worldwide call on governments at all levels to ban the spraying of glyphosate herbicides that are causing irreparable harm to people and planet.

Dr Nancy Swanson, Dr Mae-Wan Ho and Prof Peter Saunders

Add your signature here now: http://www.i-sis.org.uk/Independent_Scientists_Manifesto_on_Glyphosate.php

Forward to your local government representatives and demand a ban on glyphosate spraying in your local community

Following the World Health Organization’s reclassification of glyphosate as “probable human carcinogen” (Glyphosate “Probably Carcinogenic to Humans” Latest WHO Assessment, SIS 66), an international group of 81 scientists and medical professionals independent of the chemical industry launched a manifesto calling on governments at all levels to stop spraying glyphosate herbicides, based on overwhelming evidence of harm to people and planet from scientific studies and witness testimonials compiled by the group. The manifesto, launched 15 June 2015, is now supported by 406 scientists/medical professionals and 672 non-scientists from 57 different countries around the world. People are beginning to recognize just how corrupt the regulatory regimes are in both Europe and the United States (Scandal of Glyphosate Re-assessment in Europe, SIS 63). Those regulators have effectively allowed Monsanto and other glyphosate manufacturers to poison people and the living world for the past 20 years with an unprecedented rise in glyphosate usage. Glyphosate contamination is now pervasive, on land, in water and in the air. Glyphosate residues have been found in people and animals, including mother’s milk, at concentrations known to be toxic and/or potentially carcinogenic (see A Roundup of Roundup Reveals Converging Pattern of Toxicity from Farm to Clinic to Laboratory Studies, SIS 65).

More and more governments are taking appropriate action to limit and ban the use of glyphosate herbicides (see Fallout from WHO Classification of Glyphosate as Probable Carcinogen, SIS 67). In countries where the central government has failed to act, bans can be effectively imposed at local community levels to support action already taken by individuals who have stopped using glyphosate in their homes, gardens and farms, but have no control over public spaces such as schools, public parks, sports grounds, playing fields and playgrounds, and pavements in commercial and residential precincts where glyphosate is widely used for weed control; and as desiccant on farmland for drying crops (including non-genetically modified food crops) before harvesting, thereby contaminating our entire food supply.

The Manifesto is reproduced in full below. Please add your name in support.

Independent Scientists’ Manifesto on Glyphosate

We, the undersigned international scientists and medical professionals, call on governments at all levels to ban the spraying of glyphosate herbicides. As professionals who have read the literature on glyphosate and its effects, we have concluded that it is causing irreparable harm.

The World Health Organization’s recent reclassification of glyphosate as a “probable human carcinogen” is only a small part of the known toxicity of glyphosate herbicides. Chronic exposure to glyphosate herbicides is associated not only with cancers, but also with infertility, impotence, abortions, birth defects, neurotoxicity, hormonal disruption, immune reactions, an unnamed fatal kidney disease, chronic diarrhoea, autism and other ailments.

In addition to human diseases, glyphosate is linked to more than 40 new and re-emerging major crop diseases. It is causing irreparable harm to the entire food web; including the plant kingdom, beneficial microbes that supply nutrients to our crops and soils, fish and other aquatic life, amphibians, butterflies, bees, birds, mammals, and the human microbiome.

For the sake of the planet, our children and our grandchildren, all spraying of glyphosate herbicides should be immediately replaced with eco-friendly alternatives that restore damaged food webs. We urge you to have the courage to stop the destruction of life on our planet as leaders for future generations.

Scientific reviews, papers, and witness testimonies are presented here:

Research papers on glyphosate compiled by Dr Alex Vasquez: http://www.i-sis.org.uk/pdf/Glyphosate_research_papers_compiled_by_Dr_Alex_Vasquez.pdf

Glyphosate crop interactions reviewed by Dr Don Huber: http://www.i-sis.org.uk/pdf/Glyphosate_crop_interactions_reviewed_by_Dr_Don_Huber.pdf

A Roundup of Roundup® Reveals Converging Pattern of Toxicity from Farm to Clinic to Laboratory Studies: http://www.i-sis.org.uk/Roundup_of_Roundup.php

The complete list of signatories can be found here:
http://www.i-sis.org.uk/Independent_Scientists_Manifesto_on_Glyphosate_signatures.php#signed

Add your name here now: http://www.i-sis.org.uk/Independent_Scientists_Manifesto_on_Glyphosate.php
Climate Change

O₂ Diving Towards Danger Point

Not only is O₂ dropping faster than CO₂ rising, it is diving towards the danger point much faster than previously thought, O₂ accounting is urgently needed  

Dr Mae-Wan Ho

New analysis of O₂ records raises alarm

In O₂ Dropping Faster than CO₂ Rising (SiS 44), I highlighted new research showing the depletion of atmospheric oxygen accelerating since 2003, which coincided with the biofuels boom, and warned that climate policies focusing exclusively on carbon sequestration could be disastrous for all oxygen-breathing organisms including humans. I also call for O₂ accounting in climate policies. The article attracted many comments not all favourable (see http://www.i-sis.org.uk/02DroppingFasterThanCO2Rising.php).

Now, six years later, a detailed analysis of the atmospheric O₂ records in 9 stations around the world shows that O₂ is not just falling faster than CO₂ is increasing, it is actually dropping more than 10 times faster than previously thought. If it continues at this rate, the danger point will be reached in thousands of years or sooner, instead of tens of thousands of years.

One should bear in mind that although the proportion of O₂ in the atmosphere is about 21 %, much, much higher than CO₂ (currently ~0.4 %), the dangerous level of oxygen according to the US Occupational Safety and Administration and the US National Institute for Occupational Safety and Health is 19.5 %. In humans, failure of oxygen energy metabolism is the single most important risk factor for chronic diseases including cancer and death.

The Scripps O₂ Program

The new analysis has been carried out by Valeri Livinia and colleagues at National Physical Laboratory, Teddington, and John Innes Centre, Norwich in the UK. They used datasets on atmospheric O₂ levels collected by the Scripps Institution of Oceanography at La Jolla, California in 9 stations around the world (see Figure 1) under the direction of Prof Ralph Keeling, who pioneered the measurement techniques in his Ph D thesis at Harvard University in 1988. Records since 1989 are available from Scripps Pier and Alert in Alaska, although these are not continuous. Continuous records from 7

Detailed analysis of the atmospheric O₂ records in 9 stations around the world shows that O₂ is not just falling faster than CO₂ is increasing, it is actually dropping more than 10 times faster than previously thought. If it continues at this rate, the danger point will be reached in thousands of years or sooner.

Figure 1  Nine Scripps stations measuring changes in atmospheric O₂ around the world

Figure 2  Downward trend of O₂ concentration in all nine datasets
stations extend back to 1993, and data for the remaining two, Cold Bay in Alaska and Palmer Station in Antarctica, are available back to the mid-1990s. Oxygen levels are measured as changes in the ratio of oxygen to nitrogen $O_2/N_2$ of sampled air relative to a reference sample of air pumped in the mid-1980s and stored in the Scripps laboratory. The unit is ‘per meg’ such that a decline of 1 per meg is equal to 1 part per million of oxygen or 0.0001 %; or 1 molecule of oxygen per 4.8 molecules of all gases in the atmosphere, not counting water vapour.

The Scripps O2 datasets also have variable timescales, with an average time interval of two weeks. Their length varies from 391 data points (Cold Bay) to 688 (Mauna Loa). For the analysis, all series were interpolated to obtain 4096 data power points separated by equal time periods.

The down-trend is faster than linear for all stations.

The data from the nine stations are displayed in Figure 2, where the downward trend is obvious in all the datasets; some looking faster than linear.

Livinia and colleagues applied Bayesian inference to the O2 concentration records, and confirm that they are all dropping at least quadratically (second order polynomial) rather than linearly (first order). Bayesian inference avoids the danger of over-fitting by automatically penalising model complexity. The Bayesian Information Criterion (BIC) is a criterion for model selection, the one with the lowest BIC value being preferred.

They tested several types of polynomial models (orders from 1 to 4, including the linear $Ax + B$ and parabolic $Ax^2 + Bx + C$), logarithmic $A + B \log x$ and exponential $-\exp^{-x} + B$, using BIC, Akaike Information Criterion AIC and Akaike corrected AICs for model selection. The results plotted in Figure 3 show that both linear and exponential models have the highest Information Criterion values, and are discarded in favour of polynomial models, for which the quadratic is taken as the most feasible (and most conservative) selection.

Complete O2 depletion in 4500 years instead of 64000 years

The average over the results of all nine oxygen records assuming quadratic (parabolic) decline is displayed in Figure 4. As can be seen, 100 % depletion of atmospheric O2 is projected to occur after 4000 years. But the danger point, as far as humans are concerned, is a depletion of ~10 %, at <2750 years; bearing in mind that this is a conservative estimate based on the analysis of available datasets. And it does not take into account the increase in population, fossil fuel consumption and other technological processes that create new oxygen sinks.

The new estimate for O2 depletion is much earlier than the 64000 years predicted by Ralph Keeling in 1988 based on contemporary fuel consumption. Livinia and colleagues commented that the 1988 estimate may be far too optimistic, as technological changes and population growth would be expected to speed up consumption of fossil fuels, while the production of fertilisers and other materials would also consume atmospheric O2. That was why they embarked on the new analysis. The problem of atmospheric oxygen deficiency should be addressed in advance, they said, before drastic changes take place, as in the recent problem of the ozone hole. “Too many environmental problems have been analysed by humanity in retrospect.” The purpose of their paper is to make an “advance warning”.

Health-threatening problems in one thousand years or sooner

Livinia and colleagues also carried out tipping point analysis on the O2 data. Tipping point analysis is a mathematical technique for identifying bifurcation or tipping points (points of sudden changes) in time series data.

The oxygen data analysed by tipping point analysis do not indicate critical behaviour in fluctuations. The transitional behaviour is defined solely by the trend. They used the derived analytical parabolic trend to project the long-term decline of the oxygen concentration. Given the exponential growth of population and consumption, continued on page 35
On May 25, 2013, anti-Monsanto demonstrations took place in 436 cities in 52 countries. With slogans such as "Either mankind will stop Monsanto, or Monsanto will stop mankind," demonstrators called for the public to be aware of the dangers posed by GMO food. On May 24, 2014, the planet again witnessed anti-Monsanto demonstrations that involved 4 million people. This year, the global anti-Monsanto march took place on May 23.

Monsanto is a transnational agro-biotech company, widely known for producing GMO seeds. In 1996, the top three seed companies in the world – Monsanto, DuPont and Syngenta – already had 22 per cent of the global seed market. But by 2011, their combined share had doubled, reaching 53.4 per cent. Monsanto alone had 26 per cent. A monopoly by corporations like Monsanto threatens the seed sovereignty of all countries, including China.

Roundup is Monsanto’s flagship product, and is a glyphosate herbicide marketed globally, widely used on GM crops such as soybeans and corn. Monsanto has long propagated that glyphosate has a very low acute toxicity, and is unlikely to pose a carcinogenic risk to humans. But in March 2015, the World Health Organization’s IARC (International Agency for Research on Cancer) had 17 experts from 11 countries produce an evaluation on glyphosate, and they pronounced it to be ‘probably carcinogenic to humans (Group 2A)’. WHO’s IARC has a classification of four

In 2014, Beijing citizens sued China’s Ministry of Agriculture, and they demanded to make public the animal test report submitted by Monsanto for securing the safety certificate for its Roundup, used to enter Chinese market. Early this year, the court notified the plaintiffs that Monsanto would be added as a party to the case.
groups of carcinogens: Group 1, Carcinogenic to humans; Group 2A, Probably carcinogenic to humans; Group 2B, Possibly carcinogenic to humans; Group 3, Not classifiable as to its carcinogenicity to humans; Group 4, Probably not carcinogenic to humans.

Chinese people cannot remain outside the global resistance against Monsanto. In 2014, Beijing citizens sued China’s Ministry of Agriculture, and they demanded to make public the animal test report submitted by Monsanto for securing the safety certificate for its Roundup, used to enter Chinese market. Early this year, the court notified the plaintiffs that Monsanto would be added as a party to the case. This case is attracting growing attention among the Chinese public.

According to a recent international report, Monsanto knew in 1981 that its flagship product Roundup is carcinogenic. Chinese food safety activists think that Monsanto not only hid the information from the Chinese government and people, but also defrauded the Chinese government and people with fake reports in order to obtain a safety license. Covering up Roundup’s carcinogenicity and the risks posed to human health by Roundup-tolerant GM soybeans and corn, Monsanto misled China to massively import and produce its products. Now China is the largest producer and exporter of glyphosate in the world, including supplies exported to Monsanto for use in the manufacture of Roundup formulations worldwide.

Eighty per cent of the soybeans consumed in China are imported. In effect, they are Monsanto’s GM soybeans. The soybeans have been sprayed with glyphosate, which had caused serious ecologic devastation and health risks to South American producers. Recently, 30,000 doctors and medical professionals in Argentina demanded that their government prohibit glyphosate. When GM soybeans are dumped on China, it seriously undermines China’s own traditional soybeans, particularly in China’s northeast. Moreover, the glyphosate residue poses incalculable risks to consumers’ health.

Seventeen European and Latin American NGOs recently submitted an open letter to the Chinese people, President Xi Jinping and Premier Li Keqiang. The letter emphasized the following: “both Monsanto and the EPA knew of the link between glyphosate and cancer as long ago as 1980, since malignant tumors and other organ damage had been recorded in rat and mouse feeding studies that were, and still are, treated as trade secrets. … After decades of health damage, it must be in the interests of the whole world for these lethal chemicals to be taken immediately out of use before any more harm is done.”

Some citizens concerned about food safety and ecological agriculture from around China recently formed a network called ‘Save Green Association,’ and built a ‘Monsanto out of China!’ website (http://www.monsanto-out-of-china.org/). The website showcases global actions against Monsanto and protests by people in China. The ‘Monsanto out of China!’ website is a channel for expressing public opinions. It calls for the following: refuse manipulation and deception, protect ecological and sustainable agriculture, resist invasion of our livelihood, and get Monsanto out of China! Its column ‘critical voices’ features statements by renowned figures in China against Monsanto, GM food and developmentalism, and their calls for enhancing ecological agriculture and food security. This website also displays pictures from around the country of volunteers—from Beijing, Hunan, Sichuan, Fujian, Gansu, Jiangxi, Yunnan, and Hong Kong—protesting against Monsanto and GM foods. There are also pictures from American citizens and Chinese students studying in the US.

In order for netizens to take part, this website has specially set up a section for supporting anti-Monsanto, inviting netizens to click on the virtual fist to express their protest. Every click on the fist will be counted by the website, to demonstrate a growing strength in unity. In addition, the website also has a space called ‘I also want to say’ for netizens to state their opinions.

The establishment of this website and the ‘Save Green Association’ is a result of a growing awakening of Chinese people to the monopoly by transnational agribusinesses such as Monsanto. It is initiated by concerned citizens and is a part of the global anti-Monsanto action. As stated by the website, anti-Monsanto is for the health of mankind, for sustainable development, and for remaking of our food system!

Anti-Monsanto is for the health of mankind, for sustainable development, and for remaking of our food system
China’s Ministry of Agriculture Accused of Colluding with Monsanto over Glyphosate & GMOS

China’s Ministry of Agriculture accused of allowing Monsanto’s glyphosate-tolerant soybean and maize to flood the Chinese market without safety tests, condoning deception, faked samples, and fabricated safety test report; Chinese citizens are demanding a shakeup of the Ministry Dr Mae-Wan Ho

Chinese citizens petition government legislative office demanding ‘shakeup’ of Ministry of Agriculture

A petition signed by more than 600 people all over China submitted to the State Council Legislative Affairs Office alleges that the Ministry of Agriculture has allowed Monsanto’s glyphosate-tolerant GM soy, maize and canola products that cause systematic harm to “mankind, animals, plants, microbes and the ecological environment” to flood the Chinese market without proper assurance that the products are safe. On the contrary, the Ministry has “colluded” with Monsanto, allowing the company to provide “fake samples”, to carry out “false tests” and “falsify safety conclusions”.

The petition says the Ministry of Agriculture and the China Disease Control & Prevention Center, in partnership with Monsanto, have “cheated” the Chinese government and Chinese people, and seriously violated the State Council’s “Agricultural GMOs Safety Administration Regulation”, amounting to a “crime of endangering public security.” (The “Agricultural GMOs Safety Administration Regulation” makes clear that “Agricultural GMO safety stated by this regulation is intended to prevent the danger or potential danger caused by GMOs to mankind, animals, plants, microbes and the ecological environment.”) China, as party to the United Nation’s Convention on Biodiversity and its Cartagena Biosafety Protocol, should strictly implement the Protocol, which stipulates that lack of scientific certainly regarding the potential adverse effects of a GMO on health and the environment shall not prevent the importing party from taking appropriate action to minimize the adverse effects. The Ministry of Agriculture has “blatantly violated” those stipulations of the Protocol.

Most controversially, the petition states: “We must therefore perform a cancer-like surgery: first investigate the extent of collusion between officials in the Ministry of Agriculture and Monsanto in cheating the Chinese government and the Chinese people; second carry out a shakeup and reorganization of the leadership of the ministry; and third, establish new leadership with a clear understanding that ecological agriculture is the only correct sustainable development direction for China’s agriculture.”

And, furthermore, “we cannot exclude the possibility that GMOs could very likely be used by overseas evil forces as a means of biowarfare” on Chinese people. Therefore, agricultural GMO is a major bio-defence issue, and cannot be regulated, supervised and administered by just one government department such as the Ministry of Agriculture. Instead, it must be placed under a special agency of the National Security Council, together with military medical research institutions undertaking bio-defence and biochemical warfare tasks, and specialists carrying out research in agricultural GMOs, inspection and quarantine, public health, and environmental protection.

The petition includes 23 attachments containing documentary evidence bearing out its allegations of the Ministry of Agriculture’s wrongdoings, four of which are in English, the rest in Chinese. Among the attachments are collections of scientific papers published in Chinese and in English on the toxicities of glyphosate herbicides.
Huge imports of GM soybean contaminated with toxic glyphosate residues

The petition points out that for many years now, China has annually imported 50-70 million tonnes of glyphosate-tolerant GM soybeans contaminated with glyphosate residues (see How Grain Self-Sufficiency, Massive GM Soybean Imports and Glyphosate ExportsLed China to Devastate People and Planet, SIS 67) to be extracted chemically into food oil with soybean meal as by-product. The soybean meal is partly processed into animal feed, and partly into soybean protein powder added to sausages, ham, frozen food, soybean milk power, biscuits, cakes, bread and even wheat flour and infant formula milk powder. GM soybean ingredients have been tested and glyphosate residues detected in soy sauce, soy paste, tofu, etc. Soybean and soy products are the GM ingredient consumed the most by the Chinese.

Monsanto “cheated” the Chinese government and Chinese people. First, Monsanto did not inform the Chinese Ministry of Agriculture that glyphosate was patented as a chelator, which causes systematic harm to the health of the soil, microbes, crops, animals and humans. Second, Monsanto failed to inform the Chinese Ministry of Agriculture that the US Environment Protection Agency had in 1985 classified glyphosate as a possible carcinogen. Third, Monsanto did not provide reports on the long-term, lifetime and three-generation study revealing the carcinogenicity of glyphosate. And fourth, Monsanto submitted a “Roundup toxicity test report issued by Younger Laboratories on 23 December 1985”, which has all the appearances of being an “outright fraud”. All those wrongdoings are documented in Attachment 1 to the petition.

How Monsanto “cheated” to obtain glyphosate and approval of GM soybean and maize

Not only has the Ministry of Agriculture ignored the harm that can be caused by glyphosate residues in the GM soybeans, it has refused to tell the truth on how Monsanto’s Roundup herbicide obtained its pesticide registration in China in 1988, and how Monsanto’s Roundup Ready soybean 40-3-2 and NK603 maize obtained their bio-safety approval of GM soybean and maize in 2004, the company did not inform the Ministry of Agriculture that glyphosate is a powerful, wide-spectrum biocide/antibiotic, capable of killing a few hundred species of microbes in animal and human gut flora, and has been patented as such. Monsanto submitted its patent application to the US Patent Office on 29 August 2003, which was granted on 22 April 2004. The patent document stated with regard to the dosage of glyphosate as biocide/antibiotic: “Generally a dosage of as little as about 1-2 milligram (mg) per kilogram (kg) of body weight is suitable.”

Second, when Monsanto applied for the bio-safety certificate for its glyphosate-tolerant soybeans and maize in 2004, the company did not inform the Ministry of Agriculture that glyphosate is also an acaricide, arthropodicide, insecticide, molluscicide, and rodenticide, and patented as such (patent submitted 29 August 2003 to US Patent Office, and patent granted 2004). The “dosage” for use stated in the patent documents: “It includes use in mammals and humans, by injection, orally, anally, intravenously, intramuscular. Generally a dosage of as little as about 1-2 milligram (mg) per kilogram (kg) of body weight is suitable.”

Third, the Ministry of Agriculture officials allegedly colluded with Monsanto in rapidly approving bio-safety certificates for insect-resistant soybean MON87701 and stacked insect-resistant/glyphosate-tolerant soybean MON87701 x MON89788 (Intacta RR2) without sufficient safety testing; and as revealed by overseas media reports, the rapid approval was to help save Monsanto 600 thousand bags of Intacta RR2 seeds. To avoid public scrutiny of this “lightning approval”, the Ministry of Agriculture has refused to disclose the “food safety” toxiuity test report for the GM soybean.

Hence, Monsanto and the officials and public scholars of the Ministry of Agriculture are charged with “using dangerous methods to harm public security”, and must be investigated to that effect.

No approval has ever been given for processing chemical extracted GM food oil, chemical extracted GM soybean protein powder added to numerous food produces processed from huge imports of GM soybean. To make matters worse, according to the GM Food Hygiene Management Method implemented 1 July 2002, Article 3 states that GM food must be examined and approved by the Ministry of Health before production or import. But the Ministry of Health in response to application for disclosure on 18 November 2011 confirms that they have “never accepted or approved” applications to process food oil from Monsanto’s glyphosate-tolerant GM soybean 40-3-2, nor applications to process them by chemical extraction.

School lunches all cooked with chemically extracted GM soybean oil

Yet, school lunches in primary and middle schools in Beijing, paid for by the government, have all been cooked with chemically extracted GM soybean oil. Since early 2011, representatives of student parents and food safety volunteers have approached the Beijing Education Committee, requesting a change to non-GM compressed food oil.

On 12 March 2012, the parents’ representatives were invited to...
hold discussions with the leaders of one of the departments in the Ministry of Education. During the meeting, the parents’ representa-
tives pointed to official documents issued by the Hangzhou Educa-
tion Bureau, the Wulumuqi Education Bureau, the Shandong Anju Education Bureau, and the Qingdao Food & Drug Supervision and Administration Bureau, requesting that school lunches for students should change to healthy non-GM compressed food oil. But an of-

cial of the Education Ministry explained that they “have difficulty”,


• The Xinmin Evening News reported on 22 November 2011 that
the rate of precocious puberty in Chinese girls has increased
10-fold over the past 10 years
• The first “Public Health White Paper” issued by the Beijing


and published by


The petition also charged Luo Yun-bo, and Huang Kun-lun, president and profes-
sor respectively of Food Science Nutrition Engineering Col-
lege of China Agriculture, and Zhang Qi-Fa, academician at Huazhong
Agriculture University for using a natural bacteria Bt protein toxin


• A survey reported by Reference News on June 2, 2013 found the
rate of birth defects among the newborn in China during the past 10-20 years, coinciding with the rapid increase in imports of GM
soybeans. Among the attachments is quotation from an article entitled “We
must face the harm caused by imported GM soybeans to 1.3 billion
Chinese people” written by Mi Zhen-yu, former Vice President of
President of Monsanto during his visit in 2009 to


The petition alleges that a “consensus” between former Minister of
Agriculture Sun Zheng-cai during his visit to Monsanto with CEO Grant
The petition points out that China’s legislation on GMO is
riddled with loopholes. GM crops and/or hybrid crops developed from
crossing GM crops with non-GM crops are “smuggled” through
the regulatory system under the guise of traditional species or hybrid


• The “2012 Chinese male sperm quality survey white paper” of
the China Population Association reports that the total number of
infertility patients in China already exceeded 50 million,
accounting for 15.6 % of the child-bearing age population. Ten
years ago in 2002, this figure was 8 %, and 20 years ago in 1992, it was
3 %, 40 years ago during the 1970s, infertility was not more than
1 %
• According to a report by the Xinhua website, the prevalence of
Parkinson’s patients in China has increased more than 20-fold
during the last 20 years
Currently, the prevalence of cardiovascular disease has exceeded
13 %; and prevalence of chronic kidney disease has reached
10 %.
These figures in China echo the increases in 22 diseases in the US
that closely parallel the rise in GMos and glyphosate use (Marked
Deterioration of Public Health Parallels Increase in GM Crops and
Glyphosate Use, US Government Data Show, SIS 65). Similar upsurges
in birth defects and cancers in Argentina have been found as GM soybean cultivation increases (Devastating Impacts of Glyphosate
Use with GMO Seeds in Argentina, SIS 66). China is by no means the
only country being poisoned by glyphosate herbicides and GMos.


• The “2012 Chinese male sperm quality survey white paper” of
the China Population Association reports that the total number of
infertility patients in China already exceeded 50 million,


• The 23 Attachments (first four in English)
Attachment 1: During the process whereby Monsanto obtained the
“pesticide registration” for Roundup in 1988, Monsanto cheated
www.i-sis.org.uk/china_petition_and_attachments.php
Attachment 2: Thirteen studies by Chinese researchers reveal that
glyphosate damages protein and lipids, causes cell apoptosis and
necrosis, shows obvious damage to liver cells, is mutagenic, causes
reproductive toxicity, and has strong ability to cause birth defects.
http://www.i-sis.org.uk/china_petition_and_attachments.php
Attachment 3: Forty six studies by overseas scholars found that
glyphosate or glyphosate formulated herbicides cause cell toxicity,
DNA damage, teratogenic, mutagenic, and reproductive toxicity,
along with miscarriage. http://www.i-sis.org.uk/china_petition_and_attachments.php
Attachment 4: Seventeen studies show evidence that glyphosate is an Endocrine Disrupting Chemical (EDC). http://www.i-sis.org.uk/china_petition_and_attachments.php
Attachment 5: During the process of obtaining the “bio-safety certificate” for glyphosate-tolerant GM soybean 40-3-2 and maize
NK603, the leaders of the Ministry of Agriculture, China CDC and
Monsanto colluded internally and externally used “fake samples,
falsified tests, and made false safety conclusions” to cheat the
Analysis of intestinal microbiota in mice fed with Cry1C protein in acute toxicity tests. Led by Luo Yun-bo, President, and Huang Kun-lun, Professor, clearly prove that Cry1C protein harms health. Yet they falsely concluded, “Cry1C protein is safe for mice from the point of intestinal microbiota.” To support the lie that GM Bt rice is “safe to eat.”

Attachment 5: “Intended compositional changes in transgenic rice seeds (Oryza sativa L.) studied by spectral and chromatographic analysis coupled with chemometrics methods” by A Zhongshan University team published in Feb 2010 by Journal Agric Food Chem. It reveals significant changes in nutritional contents of the GM Bt rice studied by academician Zhang Qi-fa compared with the corresponding non-GM rice species, which are harmful and not beneficial to human health. http://blog.sina.com.cn/s/blog_4b1b7e9d0102vkmm.html

Attachment 6: The Ministry of Agriculture officials, colluding with Monsanto, rapidly approved the “bio-safety certificates” for insect-resistant soybean MON87701 and double stacked insect-resistant/glyphosate-tolerant soybean MON87701×MON8978 Intacta RR. This is illegal, having been granted without sufficient safety testing, and, as revealed by overseas media reports, the rapid approval of MON87701×MON8978 Intacta RR2 was to help Monsanto save 600 thousand bags of such seeds.

http://blog.sina.com.cn/s/blog_4b1b7e9d0102vk4u.html

Attachment 7: The Ministry of Health government disclosure application response issued on Nov. 18 2011 confirms that they have “never accepted or approved” applications to process food oil from the Monsanto glyphosate-tolerant GM soybean 40-3-2 nor such applications to process them by chemical extraction process. http://blog.sina.com.cn/s/blog_4b1b7e9d0102vkae.html

Attachment 8: The Ministry of Agriculture government disclosure application response issued on June 27 2014 confirms that they have not evaluated nor approved the production and sales of food oil and soybean protein powder processed from Monsanto glyphosate-tolerant GM soybeans.

http://blog.sina.com.cn/s/blog_4b1b7e9d0102vk44.html

Attachment 9: On Aug, 1, 2012, the government information disclosure application response issued by the Ministry of Agriculture stated: “The official letter issued by our Ministry on Sep 28 2011 is a ‘confidential’ document, according to the PRC Government Information Disclosure Regulation and concerned stipulations, shall not be disclosed.”

http://blog.sina.com.cn/s/blog_4b1b7e9d0102vkj3.html

Attachment 10: “We Must Face the harm caused by imported GM soybeans to 1.3 billion Chinese people” by Mi Zhen-yu (Former Vice President, Academy of Military Science, Doctoral tutor, Lieutenant General) published by “Science & Technology Abstracts Newspaper” on April 25, 2014.

Attachment 11: The Ministry of Agriculture monopolizes the responsibility of the agricultural GMO bio-safety evaluation and the issuing of “bio-safety certificates”, therefore at the same time undertakes the responsibility of monitoring consumer health effects resulting from such actions. There is very clear correlation between the 1.3 billion Chinese people consuming more and more glyphosate-tolerant GM soybeans, GM canola and the rapid increase of a series of malignant diseases during the past ten years, but the Ministry of Agriculture refuses to organize any epidemiological investigation.

http://blog.sina.com.cn/s/blog_4b1b7e9d0102vkzn.html

Attachment 12: The Ministry of Agriculture refuses to disclose contents of “the consensus reached by Minister Sun Zheng-cai when he met President Grant during his visit to USA in 2009.”

http://blog.sina.com.cn/s/blog_4b1b7e9d0102vkj3.html (deleted by webmaster)

Attachment 13: When Monsanto applied for the “bio-safety certificate” for glyphosate-tolerant GM soybeans and maize, Monsanto purposely did not inform the Ministry of Agriculture that glyphosate is a powerful, wide-spectrum biocide/antibiotic. http://blog.sina.com.cn/s/blog_4b1b7e9d0102vkcc.html

Attachment 14: When Monsanto applied for the “bio-safety certificate” for their glyphosate-tolerant soybean in 2003, Monsanto purposely did not inform the Ministry of Agriculture that glyphosate residue is acaricide, arthropodicide, insecticide, molluscicide, rodenticide! http://blog.sina.com.cn/s/blog_4b1b7e9d0102vkew.html

Attachment 15: Luo Yun-bo, President, Huang Kun-lun, Professor (Food Science & Nutrition Engineering College of China Agriculture), and Zhang Qi-fa, Academician (Huazhong Agriculture University) carried out a test using a “natural bacteria cultured Bt protein toxin,” essentially different from the “GM Bt protein toxin”; this constitutes a false test with a fake sample to falsify a conclusion of safety.

http://blog.sina.com.cn/s/blog_4b1b7e9d0102vkir.html

Attachment 16: The observation and measurement results of “Analysis of intestinal microbiota in mice fed with Cry1C protein in acute toxicity test,” led by Luo Yun-bo, President, and Huang Kun-lun, Chinese government and Chinese people. http://blog.sina.com.cn/s/blog_4b1b7e9d0102vk44.html

Attachment 22: “Healthy condition of soil is the precondition for normal growth of crops and sustainable agriculture.” Scholars from the Life & Environment Science College of the Shanghai Normal University and the Resource & Environment College of the Northeast Agriculture University proved that GM Bt rice, GM Bt cotton, and GM Maize damage the balance of the microbial colony, i.e. the most critical condition of healthy soil. A study by an environmental science scholar of the Zhongshan University proves: The growing of GM papaya also causes “significant increase of both the numbers and resistance of resident microorganisms (bacteria, actinomyces and fungi),” providing important evidence that GM papaya endangers the ecosystem health of the human gut microbial colony and facilitating the development of antibiotic resistant bacteria. http://blog.sina.com.cn/s/blog_4b1b7e9d0102vk60.html

Attachment 23: During the “Biosafety International Forum 5th Workshop” in May 2013, a citizen representative pointed out, China’s legislation on GMO exists with many loopholes, http://blog.sina.com.cn/s/blog_4b1b7e9d0102vkp7.html
China’s transgenic maize with high phytase to make phosphate available has had its bio-safety certificate renewed without requisite molecular characterization and supporting safety data; it is a poor strategy for overcoming phosphorus scarcity, and has the potential to cause serious harm to health and the environment Dr Mae-Wan Ho

Bio-safety certificate renewal signals commercial release
China’s first transgenic maize with greatly enhanced levels of phytase was created in 2008 by academician Yun-liu Fan and her team at Biotechnology Research Institute, Chinese Academy of Agricultural Science in Beijing. It was granted a ‘bio-safety certificate’ in 2009 for 5 years, which failed to be renewed in August 2014 when it expired; and it seemed to the outside world that China had given up on its genetically modified (GM) rice and corn on account of strong consumer rejection. However, at the beginning of 2015, the Chinese company Origin Agritech Limited based in Beijing’s Life Science Park announced that the bio-safety certificate for the transgenic phytase maize has been renewed.

Origin Agritech Limited describes itself as “China’s leading agricultural biotechnology company specializing in crop seed breeding and genetic improvement, seed production, processing, distribution and related technical services. As the first Chinese seed company with an in-house biotech research center, Origin leads the development of Genetically Modified (GM) technology.”

In addition to the original phytase maize, the company has further incorporated phytase traits into two of its best-selling commercial corn hybrids; and commercialization of these two corn hybrids is pending approval from the Chinese government. They have also

Figure 1  Phytic acid (also known as inositol hexakisphosphate)
transformed herbicide resistance, insect resistance and drought stress genes into corn inbred lines. However, the company’s portfolio includes many conventionally bred crop varieties and marker assisted breeding is done to improve corn and rice.

**Why transgenic phytase maize?**

Phytase is an enzyme that breaks down phytic acid (Figure 1), an inositol (a carbohydrate) with 6 phosphate groups, also known as inositol hexakisphosphate.

In seeds, phytic acid is deposited as a mixed salt within protein storage vacuoles. Besides sequestering inorganic phosphate, it also binds divalent cations such as Fe2+, Mn2+, Mg2+, Zn2+ and Ca2+. Early research had suggested that phytic acid is an anti-nutrient, because it interferes with the utilization of inorganic phosphate as well as the minerals chelated by phytic acid. Proponents suggest that reducing the phytic acid content of grains would be beneficial for human health. In the developing world, the high phytate in grains can contribute to iron and zinc deficiency if the diet is poor and deficient in minerals. In the developed world, low phytate in grains could have nutritional and environmental benefits for animal agriculture. While ruminants normally have microorganisms in the gut that digest phytate, monogastric animals such as pigs, poultry and fish do not. They produce manure high in phytate phosphate that’s unavailable to crops and instead pollutes water, resulting in eutrophication. Farmers have to supplement animal feed either with rock phosphate, a non-renewable resource getting increasingly scarce (see Phosphorus Starvation Threatens the World, SIS 61), or add phytase isolated from bacteria to release phosphate from grains after ingestion.

Beginning in the early 1990s, several low phytic acid (lpa) mutants were isolated in maize, barley, rice, wheat, soybean as well as Arabidopsis thaliana. Plants homozygous for the lpa typically produce seeds in which phytic acid is reduced by 50 to 95 %, and almost always with corresponding increase in available phosphate. Animal feeding studies confirmed that lpa seeds provide more available phosphorus and reduce phosphorus in animals waste. The problem with systemic reduction of phytic acid levels in the mutants is that it often has negative impacts on seed and plant performance, such as reduced germination, emergence, stress tolerance and seed filling. Genetic modification offers a more targeted approach that can disrupt phytic acid accumulation in seeds without reducing seed dry weight or impairing germination.

**China’s transgenic phytase maize**

Yun-liu Fan and colleagues created transgenic maize plants expressing high levels of phytase gene (phyA2) from the fungus Aspergillus niger in the seeds, using a construct driven by the maize embryo-specific globulin-1-promoter. This limits the disruption of phytic acid accumulation to the seed without affecting other vital functions of the plant.

The phyA2 gene from A. niger line 963 encodes 57 amino acids with a signal peptide at the N terminus for extracellular secretion. The yeast-expressed recombinant phyA2 enzyme lacks the signal peptide, and remains intracellular. It has high specific activity on phytic acid with two optima at pH 1.6-2.0 and 5.5-5.9. The specific activity at pH 1.8 is 77 % that at pH 5.8. At pH 3.0 - average pH in animal digestive tract - phyA2 retains 40 % of activity. The widely used phyA enzyme has only 25 % activity at pH 3.0. The phyA2 enzyme is marketed as commercial feed additive in China.

Two vectors were constructed with the maize embryo-specific globulin-1 promoter and terminator for the A. niger phyA2 gene. One of them has a signal peptide sequence from the barley α-amylase gene. In addition, a plasmid carrying the maize histone H2B promoter, the maize ubiquitin 5’UTR intron-1, the bar gene (for guslofosinate resistance) and the potato protease II terminator was used as the selectable marker.

The phyA2 gene expression cassette was excised with a restriction enzymes for transformation, as was the bar gene expression cassette. Transformation was carried out with tungsten microprojec-

- **The use of glyphosate kills off beneficial gut bacteria not only in human beings but also in animals including ruminants, which suffer severe diarrhoea from Clostridium as a result**

Basta (Bayer, AG) paste was used for a leaf painting assay to identify transformed plants carrying the bar gene at the five-leaf stage.

A total of 40 independent transgenic events were obtained; 33 without the signal peptide sequence and 7 with the sequence. All events produced T1 seeds. T1 seeds were produced by crossing the T0 seeds with a non-transgenic line. Phytase activity was determined using 5 randomly selected seeds. Based on the phytase activity in T1 seeds, selected events were planted in the greenhouse and self-pollinated to produce T2 seeds. Two events were propagated to produce T4 and T5 seeds. The germination frequency ranged from 75 to 88 % in the field and 80-92 % in the greenhouse, the phenotypically ‘wild-type’ plants (with low phytase activity) behaved similarly. The T2 segregation was consistent with (but does not prove) Mendelian inheritance for a single locus (site) for bar gene, and 16 out of 20 bar plants showed phyA2 gene on PCR analysis.

Southern blot analysis was carried out to estimate copy number of the transgene in the event selected, and interpreted as possessing two copies of the transgene. The phyA2 protein expressed in yeast is glycosylated (with carbohydrate chains added) and has a molecular weight ~75 kD; when de-glycosylated, the protein has a molecular weight ~55 kD. The transgenic phyA2 protein was ~60 kD, indicating it is glycosylated differently from the yeast protein. The T4 seeds were assayed for phytase activity and had 2 200U/kg on average, about 50 times that of the wild-type control. The phytic acid of wild-type control seeds ~3 mg/g was reduced to 2.39-2.66 mg/g in transgenic seeds. The Pi (inorganic phosphate) contents were ~0.12 and 0.41-0.56 mg/g in wild-type and transgenic seeds respectively. Thus, phytic acid was reduced by 23% and Pi increased by 3-fold.

**Lack of molecular characterization of transgenic phytase maize with regard to safety**

The paper describing the creation of the transgenic phytase maize
problems with transgenic high phytase strategy

As Prof Joe Cummins stated in his article, high phytase transgenic crops “do not have the ability to fabricate phosphorus to replace that required for human nutrition in the long run.” Nor do they recover phosphate that has been lost in wastes and runoffs that pollute water ways. Major remedies for phosphate depletion involve phosphorus recycling, such as recovery from municipal waste, from animal bone, and recovery through green manure with long roots that can extract phosphate from deep soil layers.

Health impacts of high phytase low phytate grain

But there are other problems with potential health impacts of high phytase grain. No long-term feeding trials have been carried out on any animal, and none whatsoever on livestock, short-or long-term, for which the grain is intended. The potential impact on human health could be substantial, considering that, as acknowledged by a proponent of low phytic acid transgenic strategy: “Phytic acid is ubiquitous in eukaryotes and regulates many cellular functions, including stress responses, development, phosphate sensing and homeostasis, DNA repair, RNA editing and mRNA processing.”

Furthermore, the suggestion that reducing phytic acid content of grains could have significant beneficial effects on human health in the developing world and environmental and animal health benefits for livestock agriculture in the developed world (see above), have been strongly contested. The evidence for both was described by a critic as “flimsy at best”. Recent studies show that the ‘anti-nutrient’ effect of phytate is manifest only when large quantities of phytate are consumed in combination with a diet poor in trace elements. Besides, the mere addition of citric acid to feed has been shown to increase phytate-phosphorus use. New Hampshire x Columbian crossbred male chicks and commercial broiler male chicks from 8 to 22 d of age were fed ordinary corn with varying amounts of citric acid. Citric acid was found to improve phosphorus utilization and weight gain as well as gain/feed ratio and bone ash (of tibia). The results suggested that 3 to 4% citric acid can release or spare between 0.05 and 0.1% P. The mechanism of citric acid action is still unclear; the authors speculated that citric acid could chelate Ca to prevent the formation of insoluble Ca phytate complex.

In fact, phytate itself has been consistently and reproduc-
ibly associated with health benefits, including broad-spectrum anticancer activity, enhancement of natural killer cell activity, and prevention of kidney stones and calcification.

**Phytate and glyphosate herbicides**

Animals including humans have very low levels of phytase, though rats have 30 times that of humans. In general humans do not produce enough phytase to safely consume large quantities of high phytate food on a regular basis. But probiotic lactobacilli and other species of endogenous digestive microflora can produce phytase, even in monogastric animals.

Unfortunately, these bacteria are susceptible to glyphosate herbicides, increasingly large quantities of which have been used on our farms, gardens, parks, residential and commercial areas based on false claims perpetrated by Monsanto with the collusion of regulators that glyphosate is harmless to human beings even in the face of overwhelming evidence to the contrary (see A Roundup of Roundup Reveals Converging Pattern of Toxicity from Farm to Clinic to Laboratory Studies, SIS 65).

As Anthony Samsel and Stephanie Seneff wrote in their review on glyphosate: “Lactobacilli and other beneficial gut bacteria produce the enzyme phytase, which catalyses the release of phosphate from phytates and improves the intestinal absorption of important minerals such as iron and zinc... Because glyphosate reduces the number of these types of bacteria in the gut, it should enhance the chelating potential of phytates. This is likely a protective measure to avoid excess bioavailability of free phosphate, which is problematic in transport in the presence of glyphosate. Glyphosate’s known ability to itself chelate divalent cations is likely a factor as well [in zinc deficiency]. Zinc deficiency increases the risk of diarrhea, pneumonia and malaria in infants and young children.”

The use of glyphosate kills off beneficial gut bacteria not only in human beings but also in animals including ruminants, which suffer severe diarrhoea from Clostridium as a result.

In other words, the way to improve animal nutrition and human health is not through transgenic high phytase maize, but pesticide-free organic agriculture.

**Phytase amended feed an agronomic and environmental disaster**

High phytase maize, if excreted along with animal manure could itself cause problems with soil phosphate content and phosphate leaching from the soil resulting in eutrophication. This comes from experiences of farmers on the ground. Howard Vlieger, a farming consultant based in Iowa tells me: “There is significant reason to believe that the phytase used in livestock production in the US could be mobilizing phosphorus from the soil. There are a growing number of instances where the phytase-treated manure is applied to crop land and the phosphorus levels are declining even with repeated applications of manure containing phosphorus.”

Arthur Dunham, Iowa-based clinical veterinarian gives further details. He tells me that industry started adding phytases to poultry and pig diets in the 1990s; Nutraphos sold by BASF was one of the leading products. It contains phytase from E. coli and the feed industry hated working with it because it was a small unstable protein that could not withstand the heat of pelleting, so the phytase had to be sprayed on after pelleting. BASF was the first to find some E. coli strains that produced heat-stable phytase so they switched to them about 2006, and the rest of the industry followed suit, as all ingredients could be put in the premixes ahead of pelleting.

The increased stability of the phytase is the problem. “No one thought about what might happen if this product which breaks down phytate to make P more available keeps working in the pit and out in the field.” Arthur says. “Phytate is the part of organic matter that holds inorganic phosphate, and keeps it from leaching away like nitrate, unless there is soil loss. With the use of the new stable phytases, the available phosphorus in soil can drop like a rock. A slight spring rain or snow melt can carry the phosphate away, or the phosphate is just running off with nitrate in the tile water.”

Worse yet, this phosphate also takes the place of the glyphosate bound to Ca²⁺ and Mg²⁺ so it can free up the glyphosate to be an active antibiotic again, Arthur suggests, along with Dr. Mike McNeill, an agronomist at Iowa State University. “We have some soil test data and some clinical data,” Arthur says, “but we are not getting much support.” A few swine producers are adding a product called Accomplish with their starter fertilizer which is a phytase from Syngenta to try to correct the crash in P for their crop! “If I could consistently find some of the original less stable phytase products, I would approve of my swine clients using them,” Arthur adds.

“How do we know how stable the phytase produced in this GMO corn is going to be and how are we going to keep a swine producer from trying it on top of the phytase in his feed?” Dr. McNeill and I know of some swine clients that have seen available phosphorus levels go from around 60ppm to under 5ppm in a couple years. And it all goes to our lakes.”

**To conclude**

The bio-safety certificate has been granted and renewed for transgenic phytase maize without proper risk assessment. Existing evidence strongly suggests that commercial release of the transgenic phytase maize could be disastrous for health, agronomy and the environment.

To safeguard public health and the environment, China’s Ministry of Agriculture, which has renewed the bio-safety certificate, should make all test reports submitted to the Ministry for the transgenic phytase maize available for open scientific review. More importantly, the Ministry should support independent long-term toxicological and environmental impact studies on the transgenic phytase maize (or hybrids containing the high phytase trait) before any commercial release is contemplated.
A new study directly links the crisis of suicides among Indian farmers to Bt cotton adoption in rain-fed areas, where most of India’s cotton is grown. Many fall into a cycle of debt from the purchase of expensive, commercialised GM seeds and chemical inputs that then fail to yield enough to sustain farmers’ livelihoods (see Farmer Suicides and Bt Cotton Nightmare Unfolding in India, SiS 45).

Rain-fed cotton yield dependent on weather not pest attacks, Bt technology futile

Using physiologically based demographic modelling (PBDM) methods to assess the dynamics of weather and pests on cotton yield, this latest study led by Professor Andrew Gutierrez at University of California, Berkeley calls into question the relevancy of Bt cotton, considering that the main target of the Bt cotton, the pink bollworm, only attacks irrigated but not rain-fed cotton.

The PBDM method, unlike previous studies that focus on econometric analysis of Bt cotton yields, looks at the holistic biological and ecological underpinnings of crop yield. Using it to simulate prospective yields of rain-fed non-Bt cotton from 1980 to 2010 and its relationship to pink bollworm dynamics, the model provides a historical baseline measurement of the Indian cotton situation prior to the 1970s green revolution, where pink bollworm was the major pest of Indian cotton. Since the 1970s, insecticide technology has led to ecological destruction including outbreaks of formerly secondary pests, insecticide resistance and damage to human health. This was followed by Bt technology
that has also had negative effects on Indian cotton agriculture.

Inputting parameters on cotton growth from field experiments in India, the researchers estimated the daily effects of water stress on cotton phenology, growth and yield formation, predicting the daily growth dynamic of leaves, stems and roots as well as fruit and yield across 4 states (Maharashtra, Karnataka, Gujarat and Andhra Pradesh) where most of the suicides are occurring. The model was then run using daily weather conditions (from the Climate Forecast System Re-analysis of the United States for Environmental Prediction). Pink bollworm dynamics were modelled by capturing the phenology of dormancy induction as regulated by increased temperature and photoperiod, and spring emergence from diapause as a function of temperature.

The results show that rain-fed cotton's protection from pink bollworm arises from the timing of their fruiting season. Irrigated cotton has two fruiting cycles in a season, which is synchronised to pink bollworm emergence from diapause and development of the next generation larvae, while rain-fed cotton only has one cycle per season, fruiting only after the new adult bollworms have emerged (Figure 1). This makes Bt technology irrelevant for rain-fed cotton.

Instead, the timing, distribution and quantity of monsoon rains is the main determinant of yield; as well as other factors such as planting density and mean daily temperature. As shown in Figure 2, rainfall in Yaravtal, Maharashtra correlates with yield. These results led the authors to conclude that in low yield areas with high variability, Bt cotton does not provide assurances for yield of rain-fed cotton. And, short season non-Bt cotton is a viable option for both irrigated and rain-fed areas.

Bt cotton does not reduce insecticide use, increases cost burden

Bt crops were introduced to India in 2002 and by 2012 there were more than 1128 Bt hybrid varieties grown on 92% of cotton growing areas. They are promoted on the basis of reducing pesticide use but despite initial declines, insecticide use in 2013 reached 2000 levels while yields have plateaued nationally and farmer suicides increased in some areas. Industry has also promoted the use of insecticides and farmers, in order to avoid crop failure, likely applied increasing quantities of pesticides that do not boost yields but may instead increase ecological disruption and risk of crop failure. Industry has exploited this information gap to sell their Bt crops and insecticides. With the sustained use of insecticides added on to the costs of expensive Bt cotton seeds, farmers have been pushed into further economic distress. Computing the average profits per hectare in rain-fed cotton (revenues from sale of seed cotton minus average costs of seed,
Critiques of such studies have found that other factors explain the purported yield increases attributed to Bt cotton, including “placement bias” of irrigation and “good growing conditions.”

Previous studies do not take account of holistic agro-ecological impacts on yield

This study disputes many previous studies that have claimed increased yields as a result of Bt cotton. Bt cotton is not a yield enhancing technology, but is instead designed to protect the yield potential of the crop from damage by some lepidopteran pests like the pink bollworm. These studies fail to take into account the fact that government subsidies for fertiliser during 2003-2011 increased approximately 5-fold, that data from irrigated and rain-fed cotton were conflated in the average, and that agronomic practices were improving e.g. planting densities. Further, there has been an upwards trend in national yields from 1975-2007. Studies supporting these claims attribute rises in yield from 2004 to Bt cotton. However, as shown in this latest study, adoption of Bt cotton was only 8% in 2004 while in 2005 it was 46%, but the post-2004 yield data appear to be on the same upwards trend as before Bt cotton introduction.

Previous studies in environments ecologically disrupted by the insecticide technologies of the 1970s green revolution have also often been used as the control to which Bt cotton has been compared. Studies in ecologically disturbed environments tend to be limited to isolated small plots instead of in a larger landscape and historical framework. They are known to bias results against untreated checks, inputs such as fertilizer and water are often not controlled, and industry data have been used to predict unrealistic estimates of potential yield. Critiques of such studies have found that other factors explain the purported yield increases attributed to Bt cotton, including “placement bias” of irrigation and “good growing conditions”.

The changing face of Indian cotton colonialism

The colonisation of India’s cotton originates long before the Green revolution and the introduction of GM crops by large multinationals. India was once the global capital of textiles, and had been growing diploid ‘Desi’ cotton for 5,000 years without synthetic inputs. During this time cotton was a target of strong selection and adaptation by Indian farmers. It was not until the British colonisation of India however that the practices of cotton cultivation were dramatically altered as Britain drew on cotton as a raw material to fuel the first half of its industrial revolution. From 1790, new world cottons were introduced, and later, during the 1970s green revolution, F1 hybrid varieties that required a high input of insecticide and fertilisers. Ecological disruption followed due to the destruction of natural pest enemies, which ended in the resurgence of the pink bollworm, as well as outbreaks of new insecticide and other production costs) the study highlights the drastic increases in costs now faced by farmers (see Figure 3). Prior to hybrid varieties, costs were nil to low (0-9 rupees per kg), but as fertile local varieties became unavailable, farmers increasingly bought F1 hybrid seeds that for Bt varieties cost an average 2111 rupees per kg. The average yields in the 4 states studied ranged from 300 – 1200 kg per hectare, with low yields in Andhra Pradesh and Karnataka, and roughly half of the total area studied across the four states averaging less than 5,000 kg of lint cotton per hectare. Production costs rise from 8% of total revenues for those averaging yields of 1,320 kg ha⁻¹ to 21.1% for those averaging 500 kg ha⁻¹, resulting in a net daily income of less than 2 US dollars a day. For farmers getting only 300 kg ha⁻¹, production costs increase to 42.2% of total revenues, resulting in only 1 dollar a day of net income. Costs as a proportion of revenue decrease exponentially with yield. These data show that low yields and high variability are substantial sources of risk, exacerbated by the high costs of Bt cotton seed and continued use of insecticide.

Suicides driven by economic distress, exacerbated by Bt cotton

Revisiting the raw annual suicide data for four rain-fed, cotton growing states (Andhra Pradesh, Gujarat, Karnataka, Maharashtra) during the period 2001-2010, the authors found 80,607 of 549,414 suicides were farmers, 87% of these were males with the numbers peaking in the 30-44 age class. The authors used statistical regression analysis to assess the relationship between the suicides to each state’s averages of proportion of area seeded to rain-fed cotton, average farm size, cotton growing area, area of Bt cotton, proportion of area with Bt cotton, and simulated average yield per hectare that includes the effects of weather. They found that suicides decrease with increasing farm size and yield, but increase with the area under Bt cotton cultivation. As the authors state: “Farm size and yields are measures of poverty and risk, while the increase in Bt area is a surrogate for high costs of Bt technology adoption and continued use of insecticide.”
secondary pests, and insecticide resistance. On top of all that, the chemicals affected the health of both people and the environment. As a result, India saw its peak pesticide use in the 1990s, reaching 75,000 tons of active ingredient, 80% of which were insecticides, with 40-50% of the total applied to cotton. Outbreaks of previously minor pests such as polyphagous bollworm, whitefly and others as a result of organophosphate and pyrethroids became more damaging than the pink bollworm. Insecticide resistance also became a problem, with the defoliant S. litura in the 1980s.

Now, India faces the latest attempts by multinationals to continue on this path with the introduction of Bt crops, which have again proven to be a total disaster for the people of India, but a success for corporations in squeezing out every rupee of profit. The authors conclude that seven factors appear to have influenced the economic distress underlying the suicides, five of which are at the hands of industry:

1. Weather-related intrinsic low average yields and variability;
2. Increasing insecticide use before 2002 that increased costs and yield losses due to ecological disruption and induced pests;
3. High costs of Bt cotton seeds, fertilizers, insecticide, and ecological disruption and crop loss after the introduction of Bt cotton;
4. Crop losses due to ill adapted and possibly ineffective Bt varieties;
5. Increased usufruct costs to fund the new technologies;
6. Suboptimal planting densities;
7. The uncertain effects of weather (e.g., drought or excessive rain as occurred in 2013).

**Bt cotton fails in Burkina Faso, crop being phased out**

Cotton is also a major crop in Burkina Faso, with cotton farmers representing almost one sixth of all rural households in 2006, making it the largest employment group in the country; 30% of the GDP comes from the industry, with rural economies largely shaped by seasonal cotton yield and market price. Bt cotton was first commercially grown in 2008 and now accounts for an estimated 73% of total seed cotton production. This is about to change however, as the cotton private sector decided to start phasing out Bt cotton, reducing its share of cotton production by 10% in the next 3 years. The Bt cotton has earned a reputation for poor quality due to shorter fibre lengths and poor yields. These problems on top of increased costs of Bt seeds, as seen in India are exacerbating farmers’ impoverishment, driving some farmers to sell their lands.

**To conclude**

The publication of thorough holistic analysis of the Indian cotton system is important for understanding what is leaving farmers without any hope of sustaining a livelihood for themselves and their families. Alternative systems such as organic farming have already been shown to produce superior yields. Bt cotton, instead of bringing farmers out of debt, is fuelling the problem and should be replaced by other short-season, local and organically grown varieties.

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“targets an enzyme found in plants but not people and pets” in its labelling of the herbicide. The lawsuit applies to residents of California who have purchased Roundup at any time during the last four years. This lawsuit, if successful can encourage similar actions elsewhere in the country.

The claim that glyphosate targets an enzyme (EPSP synthase) that does not physically exist in people ignores the fact that EPSP synthase is present in the bacteria that live inside people. Moreover, these microbes are intimately linked to many physiological functions in the body that are vital to human health, and their disruption is increasingly linked to illness. The plaintiffs state in the lawsuit that “...this claim is absolutely, positively false because glyphosate does indeed target an enzyme “found in people” – in our gut bacteria”, making Monsanto’s claim “objectively false (and inherently misleading)”. The class action further alleges that Monsanto, “cannot deny that Roundup targets an enzyme that is physically located inside of people...this fact lay beyond dispute”.

Monsanto’s claim that glyphosate targets a single enzyme is also a fallacy. It has been shown to disrupt the function of many enzymes at least in part due to its metal chelating activities, a property for which the chemical was originally patented in 1964. Metals act as co-factors for many enzymes which is why metals are key to any healthy diet.

Anyone wishing to support the suit filed by T. Mathew Phillips can visit the attorney’s website.

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**Chinese citizens sue government for hiding toxicity studies from public**

Three Beijing residents have filed a lawsuit against China’s Ministry of Health requesting full disclosure of the toxicology report submitted to the Chinese government for registration of the chemical almost three decades ago. The case, a rare example of private citizens against the Chinese government, comes after more than a year of the Ministry of Agriculture failing to meet the requests of the Beijing food volunteers after they submitted the first application of disclosure in February 2014. So far, the government has refused to disclose the report for privacy and business reasons, protecting Monsanto’s commercial interests. The toxicology report was not performed independently by Chinese institutions, but was instead conducted by US-based Younger Laboratories and commissioned by Monsanto. The tests were restricted to acute toxicity in rats and rabbits being exposed via the mouth and skin, hardly a comprehensive safety test that the Chinese people can have confidence in. Further, while Monsanto filed the report for registration of the formulation product Roundup, the tests were performed on glyphosate alone. The case has not yet been heard, but the Ministry of agriculture has added Monsanto as a defendant.

The country is by far the largest producer of glyphosate, producing an estimated 70% of the world’s supply making it by far the largest producer. It is also the largest importer of GM foods, which is leading to a rising opposition to GM foods and glyphosate in the country. China is a centre of origin for soybean plants, but is now importing most of it from overseas, the majority of which is GM, leading China to be one of the leading producers as well as consumers of glyphosate (see How Grain Self-Sufficiency, Massive GM Soybean Imports & Glyphosate Exports Led China to Devastate People & Planet, SIS 67). If successful, the suit will only further expose the toxic effects of this herbicide, which go beyond its carcinogenic properties, with evidence of teratogenic and endocrine disrupting effects among others (Roundup of Roundup® Reveals Converging Pattern of Toxicity from Farm to Clinic, SIS 65).
The twin myths of the deadly dangers of saturated fat and the superlative safety of statins were thoroughly discredited recently (see Low Fat and Low Saturated Fat Diet Bad for Health and Statins for the Healthy are Harmful, SiS 66). Nevertheless, it is important to know how they originated and why they have persisted despite abundant evidence to the contrary.

Irrelevant animal experiments and false conclusions

It began with some irrelevant animal experiments and false conclusions. The presence of cholesterol in blood as well as atherosclerotic plaque had been known since 1850. In 1910, Adolf Windaus, a German physician and chemist, who later received a Nobel Prize for Chemistry, reported that atheroma in human aortas contained 6 times more free cholesterol than healthy arteries, and over 20 times more cholesterol ester. A few years later Nikolai Anitschkow showed that feeding rabbits purified cholesterol obtained from egg yolks for two or three months produced lipid laden lesions in the aorta and other arteries. However, there was little clinical interest in these observations as coronary heart disease was uncommon at the time.

That changed in 1950 when John Gofman, who had been impressed with Anitschkow’s experiments repeated them and replicated his results. He was convinced that serum cholesterol and/or its dietary sources contributed to coronary atherosclerosis but knew this was not a direct effect as the cholesterol molecule was too large to pass through the arterial wall. Little was known about how cholesterol was transported to different body sites to make vitamin D, testosterone, estrogen and other steroid hormones and Gofman was uniquely qualified to investigate this. Prior to receiving his medical degree in 1946, he obtained a Ph.D. in physics at Berkeley, where he studied under Nobel Laureates Ernest O. Lawrence and Glenn T. Seaborg. Lawrence was awarded the 1939 Physics Nobel Prize for inventing the cyclotron, a device that accelerates charged particles. Seaborg received the 1951 Chemistry Nobel Prize for using the cyclotron to discover uranium, plutonium, neptunium and other new elements and their isotopes, especially as uranium-235 was required to make the atomic bombs that ended the war with Japan.

Gofman learned of a new analytic ultracentrifugation device that had been developed in Sweden, and because of his superb background in physics and chemistry, immediately saw how it could be used to study cholesterol transport. He obtained one for his laboratory and found that the hypercholesteremic serum samples of his cholesterol-fed rabbits could be separated into two distinct compartments based on their density. The layer at the top

Although these myths were thoroughly discredited recently, it is important to know how they originated and why they have persisted despite lack of proof and abundant evidence to the contrary. Dr Paul J Rosch
of the serum sample was designated low-density lipoprotein cholesterol (LDL) and the deposit at the bottom of the test tube was called high-density lipoprotein cholesterol (HDL). As LDL appeared to be particularly proatherogenic, he proposed that it promoted the rapid progression of coronary disease in humans and later developed an atherogenic index based on lipoprotein values and ratios. This stimulated myriad investigations, including the research of Michael S. Brown and Joseph L. Goldstein, who received the 1985 Nobel Prize in Physiology or Medicine “for their discoveries concerning the regulation of cholesterol metabolism” that led to the development of statins. Gofman believed that avoiding animal fats and cholesterol would help prevent coronary disease, as indicated in his Introduction to The Low Fat, Low Cholesterol Diet: What To Eat And How to Prepare It, a 1951 book co-authored by his pediatrician wife, Dr Helen Gofman and others at Berkeley.

False association between animal fats, cholesterol and heart disease

Anitschkow also got a big boost from Ancel Keys, who chaired the 1951 conference of the UN’s Food and Agriculture Organization in Rome. He asked the audience about diet as it related to the heart attack epidemic in middle-aged men that was sweeping across the US. Prior to 1920, less than 10 percent of all US deaths were due to heart disease, but by 1950, this had escalated to over 30%. A University of Naples professor told him there was no such problem in his or nearby cities, which Keys personally verified. The only exception he found was a small class of wealthy people who dined on meat daily. The general public had meat once or twice a week and mostly ate pasta, fruits and vegetables. He also found that except for the meat eaters, the average cholesterol levels were low, and concluded that there was an association between a high fat diet, elevated serum cholesterol and coronary heart disease rates, just as Anitschkow proposed. Within a few years, Keys identified six countries where there were similar findings, and subsequently embarked on his extensive Seven Countries study in healthy middle-aged men that appeared to confirm these cause-effect relationships.

Strong support for Anitschkow also came from the Framingham study, which had been initiated by the National Heart Institute in 1948 to identify factors that contributed to heart disease. Residents of this small manufacturing town near Boston were periodically investigated for anything that might conceivably influence the development of coronary heart disease, including blood levels of sugar, cholesterol and other chemicals, fat consumption, smoking, degree of obesity, physical activity and exercise habits. Their 6-year follow-up analysis of over 4,000 healthy men and women aged 31-65 found that serum cholesterol measured at the start was significantly higher among those who experienced coronary events during this period. The Framingham study went on to identify other modifiable risk factors such as smoking, hypertension, obesity, diabetes and lack of exercise, which had additive effects. Nevertheless, the major culprit was elevated cholesterol from dietary fat. This was reinforced by the 1977 McGovern Senate Committee on Nutrition report that advised avoiding saturated fats to lower cholesterol levels and prevent heart disease.

Official government policy established on cholesterol as the culprit

This became official government policy with the establishment of the National Cholesterol Education Program in 1985, and is ongoing. September has been designated National Cholesterol Education Month, during which everyone is urged to have their cholesterol and lipoprotein levels measured. That’s not surprising as the role of cholesterol and LDL now seemed to be indisputable. In a 1958 editorial, Dr William Dock, a renowned cardiologist and Chairman of the Department of Pathology at Stanford University Medical School, wrote: “Thus the early work of Anitschkow bears comparison with that of Harvey on the circulation and of Lavoisier on the respiratory exchange of oxygen and carbon dioxide.” Dock also compared the significance of Anitschkow’s research to Koch’s discovery of the tubercle bacillus. And a more recent ranking of “Cardiology’s Ten Greatest 20th Century Discoveries” listed the top three as 1) The Electrocardiogram, 2) Preventive Cardiology and the Framingham Study, and 3) The “Lipid Hypotheses” and Atherosclerosis.

How could we have been so wrong for so long?

Note that the last author used the term “Lipid Hypotheses” to include both the saturated fat diet-heart disease theory as well as the belief that elevated cholesterol was the cause of coronary atherosclerosis. But neither of these hypotheses has ever been proven. With respect to Antischkow’s monumental discovery, rabbits are herbivorous and cholesterol is a foreign substance they cannot utilize or metabolize. In addition, although serum cholesterol were often over 1,000 mg/L (26mmol/L), the lipid deposits in arteries consisted mainly of macrophage derived foam cells rather than the fibrous and atheromatous plaques found in patients with symptomatic coronary atherosclerosis. More importantly these findings could not be reproduced when the experiments were repeated in rats, dogs and other meat eaters, so they should not be extrapolated to people.

As noted in, although Keys had data on 22 countries, he cherry picked the seven that best supported his theory. When all the countries were included, there was no fatty diet-heart disease link, and had he selected Israel, Sweden, Germany and France, he would have concluded that the more saturated fat and cholesterol consumed, the lower the incidence of coronary heart disease. Despite that, Keys was featured on the cover of Time magazine, and his claim that saturated fats in the diet clogged arteries and caused heart disease was now supported by so many prestigious organizations and authorities that it was viewed as gospel. It was severely criticized by others, such as Russell Smith, a psychologist with a strong background in mathematics and physiology. He meticulously reviewed over 2,000 studies on the links between dietary fat, cholesterol and heart disease and came to this conclusion:

“There’s no connection whatsoever between cholesterol in food and cholesterol in blood. And we’ve known that all along.

Cholesterol in the diet doesn’t matter at all unless you happen to be a chicken or a rabbit.”

www.i-sis.org.uk
All the countries in the top eight for saturated fat consumption had lower death rates for heart disease than all of the eight countries that consumed the least fat. The French consumed three times as much saturated fat as the Azerbaijani but had one-eighth the rate of heart disease deaths. Heart disease mortality in Finland was four times greater than in Switzerland, even though saturated fat consumption was similar.

“The greatest health scam of the century”

Observational studies can show a statistical correlation but not causation. Keys repeatedly tried several times to demonstrate significant changes in serum cholesterol by altering dietary fat intake with no success. Decades later, he wrote: “Dietary cholesterol has an important effect on the cholesterol level in the blood of chickens and rabbits, but many controlled experiments have shown that dietary cholesterol has a limited effect in humans.”

He was even more emphatic in a subsequent Internet magazine interview: “There’s no connection whatsoever between cholesterol in food and cholesterol in blood. And we’ve known that all along. Cholesterol in the diet doesn’t matter at all unless you happen to be a chicken or a rabbit.” However, by this time, most of the country was on a low-fat or Prudent Diet that not only restricted saturated fat, but also increased polyunsaturated liquid vegetable fats such as corn oil.

The first report on the Prudent Diet was from the Joliffe Anti-Coronary Club in Manhattan, which had as controls a group of healthy middle-aged men who followed their usual diet of lots of eggs, butter, cheese and red meat. The Prudent Diet cohort strictly avoided these and substituted a special margarine rich in polyunsaturated fats for butter. After four years, although serum cholesterol was reduced in those following the Prudent Diet, eight had died from a myocardial infarction, compared to none in the control group.

Numerous other attempts to reduce coronary disease by limiting saturated fat intake also failed and several observational studies similarly found that saturated fat restriction was associated with increased risk of coronary heart disease deaths. As Sylvan L. Weinberg, a past president of the American College of Cardiology, warned in a subsequent editorial: “The low-fat–high-carbohydrate diet, promulgated vigorously by the National Cholesterol Education Program, National Institutes of Health, and American Heart Association since the Lipid Research Clinics-Primary Prevention Program in 1984, and earlier by the U.S. Department of Agriculture food pyramid, may well have played an unintended role in the current epidemics of obesity, lipid abnormalities, type II diabetes, and metabolic syndromes. This diet can no longer be defended by appeal to the authority of prestigious medical organizations or by rejecting clinical experience and a growing medical literature suggesting that the much-maligned low-carbohydrate–high-protein diet may have a salutary effect on the epidemics in question.”

The Framingham study, which established cholesterol as the most important risk factor for coronary heart disease, was never able to prove this or to show that saturated fat increased serum cholesterol or coronary disease. During the early 1950s, detailed information on dietary habits had been obtained on a thousand participants. A follow-up analysis in 1971 found no connection between diet and serum cholesterol and the authors concluded: “These findings suggest a cautionary note with respect to hypotheses relating diet to serum cholesterol levels. There is a considerable range of serum cholesterol levels within the Framingham Study Group. Something explains this inter-individual variation, but it is not diet.” The senior author William Kannel was then Director of the Framingham study, and this report was never published for obvious reasons.

However, over two decades later, William Castelli, who succeeded Kannel as Director, wrote: “In Framingham, Massachusetts, the more saturated fat one ate, the more cholesterol one ate, the more calories one ate, the lower people’s serum cholesterol...we found that the people who ate the most cholesterol, ate the most saturated fat, ate the most calories weighed the least and were the most physically active.” And a 30-year follow-up revealed that “For
each 1 mg/dl drop of cholesterol there was an 11% increase in coronary and total mortality.”

Saturated fat-heart disease hypothesis thoroughly discredited

The Tecumseh Community Health Study, which utilized data on the composition of over 2,700 foods, found that cholesterol and triglyceride levels were unrelated to quality, quantity, or proportions of fat, carbohydrate, or protein consumed. Participants who ate the least cholesterol also had the highest blood cholesterol levels.

The World Health Organization’s Monitoring of Trends and Determinants in Cardiovascular Disease (MONICA) epidemiologic project was undoubtedly the largest study ever designed to explore the relationship between risk factors and cardiovascular disease. It began in 1971 as a collaborative effort involving 32 centres in 21 countries that monitored approximately 10 million men and women aged 25-64 for ten years. It thoroughly discredited the saturated fat–heart disease hypothesis. All the countries in the top eight for saturated fat consumption had lower death rates for heart disease than all of the eight countries that consumed the least fat. The French consumed three times as much saturated fat as the Azerbaijani but had one-eighth the rate of heart disease deaths. Heart disease mortality in Finland was four times greater than in Switzerland, even though saturated fat consumption was similar.

Although such epidemiologic studies cannot prove or disprove causal relationships, no large scale interventional trial has ever demonstrated that restricting saturated fat reduces the risk of coronary disease. This was true even when combined with reducing other risk factors like hypertension and cigarettes as evidenced by the $115 million Multiple Risk Factor Intervention Trial (MRFIT). This involved 28 medical centres and 250 researchers who screened 361,662 men and deliberately chose those who were at the highest risk in order to increase the power of the test.

Compared to matched controls, cholesterol intake was cut by 42%, saturated fat consumption by 28%, total calories by 21%, and there was a significant reduction in hypertension and cigarette smoking after 8 years. Although there was a modest fall in serum cholesterol, there was no effect on coronary heart disease and the disappointing conclusion was: “The overall results do not show a beneficial effect on Coronary Heart Disease or total mortality from this multifactor intervention.”

The Women’s Health Initiative (WHI) study was established by NIH in 1991 to address the most common causes of death, disability and impaired quality of life in postmenopausal women. This 15-year $625 million project involved 161,808 healthy postmenopausal women followed at 40 clinical centres that included three interventional clinical trials: Hormone Therapy, Calcium/Vitamin D supplementation and Dietary Modification. The Dietary Modification component evaluated the effect of a low-fat and high fruit, vegetable and grain diet on the prevention of CHD, breast and colorectal cancers. Study participants followed either their usual eating habits or the dietary regimen noted above. The results indicated that despite some reduction in cardiovascular risk factors such as blood lipids and diastolic blood pressure, there was no significant reduction in the risk of coronary heart disease or stroke in the cohort that restricted fat and increased fruit, vegetables and grain.

As William James, the father of modern psychology noted, “There is nothing so absurd that it cannot be believed as truth if repeated often enough.” Although many more articles could be cited, most people still believe that saturated fat causes heart attacks. Other reasons for this will be explored in Part 2, which will have a focus on statinsafety and efficacy, why figures don’t lie but liars can figure, why measuring cholesterol is a waste of time and money, and what really causes heart disease; so stay tuned!
Restricting Dietary Fat & Saturated Fat, a History of Infamy

The ‘Deadly Dangers of Saturated Fat’ & the ‘Superlative Safety of Statins’ Part 2

A scandalous history of scientists for hire, revolving door between food industry and regulators, not-for-profit NGOs hungry for funding, plain bad science, and fake TV commercials; sounds familiar by now? Dr Paul J Rosch

Government guidelines based on testimonials from experts who can’t be trusted

The ‘Deadly Dangers of Saturated Fat’ & the ‘Superlative Safety of Statins’ Part I reviewed some of the compelling evidence that saturated fat does not cause coronary disease by elevating serum cholesterol or any other mechanism. So how did restricting fat intake become official US government policy?

In 1961, the American Heart Association published its first dietary guidelines, in which Ancel Keys, Irving Page, Jeremiah Stamler and Frederick Stare, strongly advised substituting polyunsaturated fatty acids for saturated fat; despite the fact that in a 1956 paper, Keys proposed that the increasing use of hydrogenated vegetable oils might actually be the underlying cause of the current heart attack epidemic. Page and Stare had also previously published papers showing that the increase in coronary heart disease mirrored the rise in consumption of vegetable oils. Nevertheless, Stamler, sponsored by Mazola Corn Oil and Mazola Margarine, co-authored “Your Heart Has Nine Lives” urging people to substitute vegetable oils for butter and other “artery clogging” saturated fats. Mazola advertisements also claimed that “science finds corn oil important to your health,” even though there was no evidence whatsoever.

The US Senate Select Committee on Nutrition and Human Needs chaired by Senator George McGovern was established in 1968 to study the problem of malnutrition. In 1974, McGovern expanded the Committee’s scope to include national nutrition policy and the focus shifted from malnutrition to eating too much, especially fats. Their 1977 report, Dietary goals for the United States, was based on the belief that eliminating fat would lower cholesterol and reverse the rising incidence of heart disease. It was also strongly influenced by the food industry, and was written by Nick Mottern, a former lab reporter for The Providence Journal, who had no scientific background and no experience writing about science, nutrition, or health. He relied heavily on Professor of Nutrition at Harvard Medical School Mark Hegsted, who maintained that saturated fats elevated harmful cholesterol levels, and should be replaced by monounsaturated and polyunsaturated fats that could have beneficial effects. Mottern, a vegetarian, believed saturated fat to be as dangerous as cigarettes, and urged everyone to cut total fat intake to 30 % of total calories, limit saturated fat to 10 %, and increase carbohydrates to 55-60 %. The National Advisory Committee proposed a similar diet in the UK in 1983 even though no benefits had ever been reported from this or other fat restricted diets. A very recent thorough investigation of all the randomized clinical trials that were available prior to 1983 concluded that this diet should never have been introduced. Critics also pointed out that populations with the lowest rates of heart disease had high intakes of saturated fat. The Inuit Eskimos lived long healthy lives free of heart disease and cancer despite the fact that 75 % of caloric intake was saturated fat from whale meat and blubber. Saturated fat was 66 % of total calories for the Masai in Kenya, who consumed of large amounts of meat and milk. Yet, heart disease was rare and cholesterol levels were about half those of the average American. And human mother’s milk, which is 54 % saturated fat, could hardly be considered dangerous or unhealthy.

Others quickly got onto this “heart healthy” substitution bandwagon, which was becoming a juggernaut. Wesson recommended its cooking oil “for your heart’s sake” and a Journal of the American Medical Association advertisement described Wesson oil as a “cholesterol depressant”. Other medical and lay journal advertisements advised patients with high blood pressure to replace butter with Fleischman’s unsalted margarine. Dr Frederick Stare, head of Harvard’s Nutrition Department, recommended taking up to one cup of corn oil daily in his syndicated column, and wrote promotional articles for Procter and Gamble’s Puritan Oil. Dr William Castelli, Director of the Framingham Study, was one of several other leading authorities that promoted Puritan Oil and Dr Antonio Gotto, Jr., a former American Heart Association president, sent a letter praising Puritan Oil to all practicing physicians printed on stationery with the letterhead Baylor College of Medicine, The De Bakey Heart Center. He was apparently unaware that Dr Michael De Bakey, the preeminent heart surgeon, had co-authored a 1964 study involving 1700 patients that showed no correlation between serum cholesterol levels and the severity or extent of coronary disease.

The 1977 McGovern report was not well received and objections came from leading authorities like Rockefeller University’s Edward “Pete” Ahrens, and NHLBI Director Robert Levy, both of whom argued that nobody knew if eating less fat or lowering blood cholesterol levels would prevent heart attacks. The American Medical Association warned that the proposed diet raised the “potential for harmful effects” and others described it as a “dangerous public health experiment”. When Dr. Robert Olson urged “more research on the problem before making announcements to the American public”, McGovern’s response was “I would only argue that Senators don’t have the luxury that the research scientist does, of waiting until every last shred of evidence is in.” There can be little doubt about which side McGovern favoured, as he had spent a month at a Pritikin Longevity Center, with its draconian diet of less than 10 % of total calories from fat and 2 % from saturated fat. He told a reporter that he adhered to the diet as much as possible and regarded Pritikin “one of the really great men I’ve known in my life.”

Dairy, egg, and cattle industry representatives from farming states, including McGovern’s own South Dakota, vigorously opposed the guidelines for other obvious reasons. They also complained that the report was biased and not based on any solid evidence of efficacy or safety. As a result, additional hearings were held and a revised edition that was published several months later softened the restriction on eating meat. As their work was finished, the McGovern committee was due to expire at the end of 1997, but the Department of Agriculture was anxious to promote their recommendations, because a low fat-high carbohydrate diet would increase the sale of grains. In July 1977, Carol Foreman, a powerful consumer...
activist was appointed Assistant Secretary of Agriculture for food and consumer services. Her goal was to make the McGovern recommendations official US policy and to increase the USDA’s influence and participation in making all future dietary decisions.

She recognized this would require backing from respected scientists and organizations and the best and most appropriate resource would have been the National Academy of Sciences (NAS), which determines the Recommended Dietary Allowances of calories and nutrients. However, NAS President, Philip Handler, an expert on metabolism, told Foreman that Mottern’s report was “nonsense.” Frustrated, she consulted McGovern’s staff and they suggested hiring Hegsted, who was appointed in 1978 as USDA Administrator of Human Nutrition. Although there was no scientific support for him to find, The American Society for Clinical Nutrition had recently assembled a panel of nine experts to study the relationship between dietary practices and health outcomes. They had six recommendations that included avoiding excessive sugar, salt, alcohol and total calories, as well as cholesterol and fat, but did not provide any percentages for the latter. These recommendations were included also left the FDA to become president and co-founder of a powerful PR and lobbying company whose clients included Philip Morris, Monsanto (maker of genetically engineered corn and bovine growth hormone), Procter & Gamble (maker of the fake fat Olestra) and other huge food and drug companies. Frito-Lay was subsequently sued for labelling its GMO content as “natural”, and to avoid an additional lawsuit, agreed to emphasize on all labelling and advertisements that their low calorie chips contained Olestra. Olestra is banned in the Europe, Canada and Australia because it blocks the absorption of fat-soluble vitamins and can cause severe abdominal cramps.

Dietary guidelines restricting saturated fat have done much more harm than good

The revolving door between industry executives or lobbyists and Federal regulatory agencies is not unusual, particularly with respect to the FDA and drug companies. It helps to explain why official recommendations are often designed to increase profits rather than improve health or prevent disease. This is aided and abetted by support from respected organizations and authorities that receive lavish funding from vested interests. As Dr Marcia Angell wrote in her 2004 book The Truth about the Drug Companies: How They Deceive Us and What to Do about It: “This [pharmaceutical] industry uses its wealth and power to co-opt every institution that might stand in its way, including the U.S. Congress, the Food and Drug Administration, academic medical centers and the medical profession itself. . . . It is simply no longer possible to believe much of the clinical research that is published, or to rely on the judgment of trusted physicians or authoritative medical guidelines. I take no pleasure in this conclusion,

Figure 1 Rise in obesity coincides with introduction of Dietary Guidelines for Americans
which I reached slowly and reluctantly over my two decades as an editor of The New England Journal of Medicine.”

Things have gotten worse rather than better since then but drug companies are not the only offenders. Because of the low fat craze, food manufacturers eliminated or reduced fat in their products, but this detracted from their taste, so large amounts of fructose were added to make them appealing, especially for soft drinks. This was later found to have serious health consequences, including the development of metabolic syndrome (hypertension, increased abdominal fat, Type 2 diabetes, elevated triglycerides, low HDL) and increased risk of coronary disease. It is no coincidence that the present obesity epidemic started precisely after these low fat guidelines were first published. The steady rise in obesity in different age groups since then can be seen in Figure 1.

The American Heart Association (AHA), a nonprofit organization whose annual income now approaches $800 million, began its Heart-Check Certification Program in 1995. This allowed companies to advertise their products as “heart healthy” by displaying the AHA red heart with a white check mark logo. The first-year fee was $700 and $4,500 for annual renewals. Certification now includes different types of “Extra Lean” meat and seafood, certain nuts and grains, fish with required level of omega-3 fatty acids, etc. Unfortunately, among those recommended are chocolate milk, high sugar breakfast cereals, processed meats full of chemicals and preservative and other products that are anything but healthy.

Advertising is also misleading. Welch’s “Healthy Heart” 100% Grape Juice is a proud recipient of certification but is sweetened by fructose. An 8-ounce serving contains 36 grams of sugar and 140 calories, about one-third more than the same amount of Coca-Cola. Their Concord Grape Juice Cocktail is only 25% juice and contains high fructose corn syrup. The Academy of Nutrition and Dietetics, the “world’s largest organization of food and nutrition professionals”, (formerly the American Dietetic Association or ADA), educates and licenses registered dietitians. Its largest sponsors include over a dozen junk food companies like Coca-Cola, Pepsico and Mars that provide educational courses claiming that sugar is healthy for children. There are numerous other examples, as the words “low-fat” or “fat-free” on packaging usually mean that it is a highly processed product loaded with sugar, especially fructose.

Figures don’t lie, but liars can figure, especially when deriving statistics

As Mark Twain noted, “There are three types of mendacity in the world, lies, damn lies and statistics.” The 1st law of statistics is that if it does not support your theory, you need more statistics. The 2nd law is that given enough statistics you can prove anything; like expert witnesses, they can be used to testify for either side. Proponents of cholesterol lowering drugs have utilized this to great advantage, starting with the 1984 NIH Lipid Research Clinics’ Coronary Primary Prevention Trial (LRC-CPPT). It predicted that taking cholestyramine for 7-8 years would lower cholesterol by 28% and result in a 50% reduction in coronary morbidity and mortality. Although these goals were not obtained, the authors reported a 19% decrease in nonfatal coronary events and 50% fewer heart attack deaths. This was the first study to demonstrate that lowering cholesterol could prevent coronary disease and deaths, and headlines triumphantly trumpeted “The Lipid Hypothesis Is Finally Proven” and “Coronary Disease Prevention: Proof of the Anticholesterol Pudding.” It also served as the basis for establishing The National Cholesterol Education Program the following year, which is still in effect.

But the 19% and 30% were relative risk factors obtained by comparing the number of individuals affected in each group. The actual risk factors were only an insignificant 1.1% for nonfatal cardiac events and 2.3% for fatal heart attacks. For example, if only 1 person in a treatment group died compared to 2 in the control group, the relative risk reduction would be 50% (1 divided by 2.) But if there were 1,000 people in each group, the actual risk reduction is 0.1% (0.2% minus 0.1%). It is also important to emphasize that it took three years of screening 489,000 healthy middle aged men to recruit 3,810 men aged 35-49 with cholesterols over 265 and LDL levels greater than 190 mg/dl, hardly a representative population. Nevertheless, it was implied that women and men in other age groups would obtain similar benefits. The trial directors found various ways to hype the benefits and minimize dangers like increased suicides and violent deaths in the treatment group, and using a placebo that had increased GI side effects. Other flaws too numerous to list here such as lowering the standards for statistical significance have been documented by Ravnskov.

Leading authorities were outraged by all the ballyhoo and hype, which the eminent nutritionist George Mann summarized as follows: “They have held repeated press conferences bragging about this cataclysmic break-through, which the study directors claim shows that lowering cholesterol lowers the frequency of coronary disease. They have manipulated the data or reached the wrong conclusions. . . .The managers at NIH have used Madison Avenue hype to sell this failed trial in the way the media people sell an underarm deodorant.”

A similar primary prevention study in middle-aged men with dyslipidemia using gemfibrozil reported a 34% reduction in nonfatal infarcts and deaths from heart disease deaths. The actual risk reduction was 1.4% and the treatment group had more deaths and a 500%...
relative risk increase in basal cell carcinoma. Neither study was of much practical value as both drugs had significant side effects that outweighed their meagre benefits. Things changed dramatically with the advent of statins, which were not only more potent, but were also considered to be much safer.

**Faked TV commercial promoting Lipitor**

The advantages of statins were exploited and exaggerated in promotional material, which is why Lipitor (atorvastatin) became the most profitable drug ever, with well over $131 billion in sales. Lipitor advertisements featured a photo of Dr Robert Jarvik stating that “Lipitor reduces risk of heart attack by 36% and Lipitor lowers bad cholesterol 39-60%.” It lowered mine.” This relative risk figure suggested that out of 100 people, 36 could avoid a heart attack by taking Lipitor. The asterisk refers to the following in mice type at the bottom of the ad: “That means in a large clinical study, 3% of patients taking a sugar pill or placebo had a heart attack compared to 2% of patients taking Lipitor.” In other words, the actual risk reduction was 1%, so Lipitor was no better than a placebo rather than 36% and it is not known if that patient would be you. In addition, this was after taking Lipitor daily for 14 years and only in “patients with multiple risk factors for heart disease.”

Jarvik is represented as the inventor of the artificial heart and an authoritative cardiologist, who takes Lipitor and recommends it to family and friends. The advertising blitz, which started in March 2006, started with a fake TV commercial in which Jarvik says, “I’m glad I take Lipitor, as a doctor and a dad. Lipitor is one of the most researched medicines. You don’t have to be a doctor to appreciate that!” The commercial ends with Jarvik sculling off expertly in a very vigorous muscular fashion across a serene lake.

The problem is that Jarvik did not invent the artificial heart, was not taking Lipitor, has never been licensed to practice medicine, and has never sculled; the shots were of double with an impressive mid-aged physique and an accomplished sculler. The close up frames showing Jarvik were taken in a rowing apparatus on a platform to conceal that it was on dry land. Much of the $258 million Pfizer spent on Lipitor advertising from 2006 to September 2007 was for the Jarvik campaign, but it was a good investment.

As will be seen in Part 3, after Lipitor lost its patent protection in 2011, Crestor (rosuvastatin) became the best-selling statin brand and pressure on Lipitor continued to increase. In addition, patients taking other brands asked to be switched to Lipitor and 20% of patients taking less expensive generic statins said they would ask their doctor to prescribe Lipitor. Two thirds said the ad implied that leading doctors preferred Lipitor and many believed that Jarvik regularly treated patients. Numerous complaints prompted a congressional investigation, which revealed that Pfizer agreed to pay Jarvik a minimum of $1 350 000 for two years to serve as a pitchman, with additional stipends to family members. While there was nothing illegal about this, all promotions featuring Dr Jarvik were withdrawn in 2008 because they created “misimpressions.”

As will be seen in Part 3, after Lipitor lost its patent protection in 2011, Crestor (rosuvastatin) became the best-selling statin brand due to aggressive and accurate advertising by leading authorities with numerous conflicts of interest. The focus had shifted from lipids to inflammation as the cause of atherosclerosis and treatment was targeted to lowering C-Reactive Protein (CRP) rather than LDL. The FDA had approved Crestor in 2000 “to reduce the risk of stroke, myocardial infarction and arterial revascularization procedures” in men over 50 and women over 60 with a CRP ≥ 2 mg/l, and the presence of one additional risk factor, such as low HDL, smoking, a family history of premature coronary heart disease or hypertension. This greatly expanded the number of healthy individuals eligible for statin therapy. In addition, statins were portrayed as a panacea that could prevent or benefit cancer, Alzheimer’s and numerous other diseases they were more likely to cause. The reasons for this apparent paradox will be explained and we also discuss the impending menace of PCSK9 monoclonal antibody inhibition, apheresis and other expensive and possibly dangerous therapies designed to lower LDL. As Santayana warned, “Those who do not learn from the mistakes of history are doomed to repeat them,” so stay tuned!
The efficacy of statins was hyped and serious side effects underreported in sponsored studies both flawed and totally lacking transparency

Dr Paul J Rosch

Statins: Flawed Studies, False Advertising & Lack of Transparency

The ‘Deadly Dangers of Saturated Fat’ & the ‘Superlative Safety of Statins’ Part 3

As documented in Parts 1 & 2, no studies had ever shown that dietary fat increased cholesterol or that lowering cholesterol prevented coronary atherosclerosis. This changed with the advent of statins, especially Lipitor (atorvastin), which reported a 36% reduction in heart attacks by using relative risk statistics rather than actual risk of 1%. Crestor was more potent than Lipitor but it was also associated with more adverse side effects. In March 2004, only eight months after its release, the Public Citizen consumer-advocacy group asked the FDA to ban Crestor. Three cases of kidney failure associated with severe rhabdomyolysis (destruction of striated muscle) and one death had already occurred in the U.S. and seven cases of rhabdomyolysis and nine of kidney failure had been reported in Canada and the UK. That was ominous, as it is well established the vast majority of adverse drug reactions are never reported. Baycol, an early statin, was approved by the FDA in 1997 and by the time it was banned in 2001, 1,899 cases of rhabdomyolysis and numerous deaths from kidney failure had been documented, many of which might have been prevented since they occurred long after unequivocal evidence that the drug should have been withdrawn. A 2005 study revealed that kidney failure and muscle weakness were two to eight times more frequent among Crestor users than those taking Lipitor and Zocor (simvastatin).

Nevertheless, there allegedly were no unusual side effects or elevation of liver enzymes from the 40-mg maximal dose of Crestor taken daily for two years in the ASTEROID trial. This was the first study to show a regression of plaque volume based on intracoronary ultrasound (IVUS) measurements after treatment, as shown below in Figure 1.

It was the cross-sectional areas of atheroma that were compared before and after treatment, as it was assumed that these measurements were directly proportional to their volumes and that the area of the lumen would show a corresponding increase. However, what was not discussed in either the press releases or the article was that the area of the lumen actually decreased by a flat 4%, and as can be seen, the images also showed that the arterial wall had thickened. This might not be beneficial because a smaller lumen and a stiffer arterial wall would both tend to increase blood pressure, an effect also not addressed in the published report. The Comments section conclusion said, “This very intensive statin regimen was well tolerated”. But the total dropout rate appears to have been 25%; no details were provided to explain that. Also, the trial may have been too short for the Crestor side effects reported in other studies to have surfaced, raising questions
about long-term safety with this large daily dose that would have to be taken perpetually. In addition, there were no controls and only 349 patients.

Crestor really made headlines with the subsequent JUPITER trial in men over 50 and women over 60 with no history of heart disease but who had an elevated C-Reactive Protein (CRP) and a normal LDL. These 17,802 healthy people received either 20 mg of Crestor daily or a placebo and were followed to document the occurrence of the following end points: fatal and nonfatal myocardial infarction, fatal and nonfatal stroke, arterial revascularization, hospitalization for unstable angina or death due to a confirmed cardiovascular cause. It was scheduled to run until 520 end points had been reached. However, the way end point statistics were collected, one person might be recorded as having several, even though they had only one incident or hospitalization. There was so much overlap that it is difficult to know exactly what was being reported. It was anticipated that the study might last four or five years, but it was stopped after 23 months at which time only 393 end points had been reported. Although an “unequivocal reduction in cardiovascular mortality” was publicly announced as the major reason, the data did not support that. The only justification for termination was that the placebo group had experienced 109 more of these confusing end points and it was felt that continuing the study could subject them to increased harm.

This was exaggerated in reports claiming that Crestor reduced by almost 50% the risk for a major first cardiovascular event; but this was relative risk (RR) As can be seen below, the actual risk reduction (AR) was less than 1%.

- Rate of primary endpoint: Crestor 1.6%; placebo 2.8% → AR, 1.2%.
- Rate of fatal or nonfatal MI: Crestor 0.35%; placebo 0.76% → AR 0.41%.
- Rate of fatal or nonfatal stroke: Crestor 0.37%; placebo 0.72% → AR 0.35%

It would appear from the above that the Crestor group indeed had slightly less than half as many heart attacks, but they also had 150% more fatal heart attacks. The data was presented in a manner that obscured this, as follows:

- Any myocardial infarction: Crestor 31, Placebo 68
- Nonfatal myocardial infarction: Crestor 22, Placebo 62

To find the number of fatal heart attacks, subtract “Nonfatal myocardial infarction” from “Any myocardial infarction”. This reveals 9 deaths in those receiving Crestor (29%), compared to 6 in the placebo group (9%). Stroke was similarly presented to show a 50% reduction from Crestor:

- Any stroke: Crestor 33, Placebo 64
- Nonfatal stroke: Crestor 30, Placebo 58

This means there were 3 fatal strokes in the Crestor cohort and 6 in those taking a placebo, so that total cardiovascular deaths (12) were identical in both groups.

Conflicts of Interest, sponsor control, & problems with the placebo group and diabetes

There were also concerns about conflicts of interest and the role of the sponsor. The lead author is a co-holder of the patent for the hsCRP test used, which became the standard method of measurement at $50.00/test. Nine of the 14 authors had significant financial ties to AstraZeneca, whose investigators also collected, controlled and managed the raw data and monitored the collection sites. It is well established from other drug company sponsored studies that bias can creep in, such as the preponderance in the placebo group of patients with a family history of heart disease or metabolic syndrome, both of which significantly increase risk. Crestor is a potent statin with numerous side effects, but in JUPITER, there were just as many side effects in the placebo group. The most common adverse side effect is musculoskeletal pain, which occurs in 25%. But only 19 out of the 18,000 subjects taking part in the trial reported this symptom, 10 in the Crestor group and 9 in the placebo group. At the time the study was terminated, one in four participants no longer took their medication. No reason was given for that nor do we know why or how many of the deaths came from this group. The fact is that there was a difference of less than 50 deaths between the two groups during the study, which given the large number of participants, means that neither group was at a significantly increased risk of dying. And the gap seemed to be closing. Many feel this may explain why JUPITER was terminated prematurely, as a longer period of observation might have shown no difference or even more deaths in the Crestor group, as illustrated below in Figure 2.

In the all-cause mortality graph to the left of Figure 2, the bottom two curves for Crestor and placebo are almost identical, which happens when very small numbers are involved. On the two divergent curves at the top, the authors had to use a different scale to make it

Figure 2  Exaggerating drug benefit by blowing up the scale (see text for details)
The bottom line is that CTT [Cholesterol Treatment Trialists], which is funded primarily by drug companies, has repeatedly claimed that statins have no adverse side effects, will be reviewing only company-sponsored trials for complications that should have been looked into previously, and refuses to let others see the data that support their conclusions.

Safety in drug company trials, lack of transparency and Sir Rory Collins

JUPITER was largely responsible for changing the guidelines for cholesterol lowering drugs, as in addition to adult diabetics, most healthy people over the age of 50 were now eligible for statins. More importantly, CRP was established as a significant risk factor for coronary disease. Lowering an elevated LDL as much as possible was no longer the primary goal, and cholesterol was not even mentioned because it was evident that the cardioprotective effects of statins were not dependent on their levels. Other studies claimed that statins could prevent or be used to treat numerous disorders, including cancer, Alzheimer’s, Parkinson’s, multiple sclerosis, arthritis, cirrhosis and arthritis. As those benefits were also entirely unrelated to lipid lowering, they were attributed to anti-clotting, anti-inflammatory and other pleotropic effects.

A 2007 review of 192 published statin trials revealed that those funded by industry were 20 times more likely to produce favourable results than others without any conflict of interest. As explained in Bad Pharma: how drug companies mislead doctors and harm patients this can be achieved in numerous ways, including stopping the study prematurely so that longer-term effects are not examined. JUPITER was terminated prematurely on the recommendation of its Independent Data Monitoring Board chaired by Rory Collins, Professor of Medicine and Epidemiology at the University of Oxford and head of Cholesterol Treatment Trialists (CTT) Collaboration. Independent implies not being influenced or affected by others but there is little doubt that Collins was and is very biased about statin safety. With respect to the National Institute for Health and Clinical Excellence (NICE) recommendations that everyone 60 and older should be eligible for statins, his comment was, “some may not like the idea of mass medication but they can be reassured at least that statins have been found to have “virtually no side effects.” Because of this purported superb safety profile, a polypill containing a statin and three antihypertensive drugs is being proposed for everyone 55 years and older and adding statins to drinking water has also been suggested.

As described in detail in a recent post Statins for the Healthy are Harmful, the JUPITER publication (and hence used to advantage in marketing) earlier, and reduces the cost of the trial - all significant benefits to an industry sponsor and a financially invested research team.”

With respect to minimizing adverse effects, JUPITER was the first placebo-controlled clinical trial to document that statins (Crestor) increased risk of diabetes 25%. The lead author dismissed this by claiming that the cardiovascular benefits far outweighed any possible harm, even though adult diabetics are 2 to 4 times more likely to develop heart disease or a stroke. Had the trial continued, the incidence of diabetes might have increased significantly based on subsequent surveys. One involving 153 840 postmenopausal women followed for 12 years reported that those taking statins had a 48% increased risk of diabetes compared to controls not taking statins. Another, published earlier in 2015, found almost a 50% increase in Type 2 diabetes in white men after taking statins for six years. And in April 2015, an analysis of data from 26 000 beneficiaries of Tricare, the military health system, revealed that those taking statins for an elevated cholesterol were 87% more likely to develop diabetes after 8.5 years. This involved only people who at baseline were free of heart disease, diabetes, and other severe chronic disorders. Those taking statins were also 250% more likely to develop diabetes with complications than non-statin-using diabetics. Nevertheless, current recommendations are that all diabetics 40 and older with no other cardiovascular risk factors should take a moderate-intensity statin forever, and those with other risk factors should receive a high-intensity dose to reduce LDL by at least 50%.

The patient population was also unusual, since it would be difficult to assemble almost 18 000 people over the age of 50 or 60 with both an LDL under 130 and an elevated CRP without any history of heart disease or inflammatory disorder. It is thus not surprising that 1 315 physicians in 26 different countries were required, which averages out to a paltry 13 subjects per centre, raising additional concerns.

There were numerous other criticisms, such as bias because of significant conflicts of interest, and “the positive predictive value of hsCRP was only 1.35% (241 events in 17 802 patients) in JUPITER. This makes it a rather weak predictor of cardiovascular risk.” In addition, “The present data suggest that the all-cause mortality reduction of 20% reported in JUPITER is likely to be an extreme and exaggerated finding, as often occurs when trials are stopped early.” The justification for premature cessation is dubious, as cardiovascular deaths were the same in each group, and why would a trial be stopped because of possible increased danger to those taking a placebo? However, as was pointed out in an accompanying editorial, early termination “provides inflated estimates of benefits, understates harms, allows findings to be published (and hence used to advantage in marketing) earlier, and reduces the cost of the trial - all significant benefits to an industry sponsor and a financially invested research team.”

As previously noted, the end point tabulation was confusing as there was a major difference. The primary trial endpoint graph to the right was manipulated by using the same tactic.
British Journal of Medicine that were critical of statins safety be retracted. This was rejected and may have backfired; he revealed in an e-mail that his CTT team “had assessed the effects of statins on heart disease and cancer but not other side effects such as muscle pain.” In another letter questioning conflicts of interest for the authors of the two papers, he claimed that CTT had no commercial funding and was supported by the Medical Research Council and British Heart Foundation. Two weeks later, “in a spirit of reciprocity” he wrote another letter stating that all grants CTT had received over the last two decades totaled £68 million (€16 million dollars). An investigation of this revealed that Merck had contributed £17.5 million (€38 million dollars), and it may be no coincidence that Merck’s Zocor (simvastatin) was the most popular statin in the UK until its patent expired. With respect to the two official sponsors, The British Heart Foundation, which receives financial support from two dozen pharmaceutical and food companies, made 5 donations, the largest being £2.7 million. The Medical Research Council, which also receives funding from drug companies, made only 2 donations, the largest being £ 5.6 million. Thus, 80 % of CTT funding came from Merck, and a sizeable amount of the remainder was also likely from drug companies.

The CTT was established solely for the purpose of retrieving and reviewing all the data on statins. It has no other function. Collins had done such an admirable job in predicting that prescribing statins more widely could save 2 000 lives a year in Britain and prevent 10 000 heart attacks and strokes, that he was knighted in 2010. But with respect to safety, he had only examined the possible risk of dying, suffering a heart attack or developing cancer. Last February, due to mounting criticism, he announced that he would now review all the previous studies to investigate musculoskeletal pain, type 2 diabetes, memory loss, C1 complaints, and other known side effects. However, his database includes only company-sponsored trials and he refuses to let others see the raw data. As Professor Colin Baigent, a spokesperson for CTT, who received such a request explained, “It is important to recognise that data from participating trials are not owned by the Collaborators [CTT] but remain the property of the trial sponsors, so we are not able to provide unlimited access to the combined database.” Baigent has acknowledged receiving financial support from Astra Zeneca, Merck, Sharp & Dohme, GSK and Johnson & Johnson. The bottom line is that CTT [Cholesterol Treatment Trialists], which is funded primarily by drug companies, has repeatedly claimed that statins have no adverse side effects, will be reviewing only company-sponsored trials for complications that should have been looked into previously, and refuses to let others see the data that support their conclusions.

Is coronary disease caused by inflammation rather than cholesterol or LDL?

Reducing CRP, a marker of inflammation, best explained the benefits of Crestor in JUPITER, and since some claimed that CRP also caused atherosclerosis, it was proposed that coronary disease was due to inflammation rather than lipid deposits. There was nothing new about this, since the renowned pathologist Rudolph Virchow, who was the first to demonstrate that presence of cholesterol in atheroma in 1856, described atherosclerosis as “endarteritis deformans”. The suffix “-itis” emphasized that it resulted from an inflammatory process that injured the inner lining of the arteries, and that the cholesterol deposits started to appear subsequently. Virchow was very specific about this when he wrote: “We cannot help regarding the process as one which has arisen out of irritation of the parts stimulating them to new, formative actions; so far therefore it comes under our ideas of inflammation, or at least of those processes which are extremely nearly allied to inflammation….. We can distinguish a stage of irritation preceding the fatty metamorphosis, comparable to the stage of swelling, cloudiness, and enlargement which we see in other inflamed parts. I have therefore felt no hesitation in siding with the old view in this matter, and in admitting an inflammation of the inner arterial coat to be the starting point of the so-called atheromatous degeneration.”

Thus, atherosclerotic plaque was a response to inflammation and the cholesterol deposits came later. Notice that he described this process as “coming under our ideas of” and “nearly allied to inflammation”, but avoided calling it inflammation. That was because in 2 000 years earlier, Celsus had defined inflammation as “calor, dolor, rubor, and tumor” (heat, pain, redness and swelling), to which Virchow had added “functio laesa” (disturbance of function). These were all signs and symptoms that could be seen or felt. In contrast atherosclerosis was silent and could only be verified by microscopic examination.

So how can we define this type of inflammation other than an elevated CRP? If statins work by reducing inflammation, then why was the powerful anti-inflammatory drug Vioxx recalled because of increased heart attacks, strokes and sudden death? As the Nobel Laureate Richard Feynman emphasized, “I learned a long time ago the difference between knowing something and the name of something.”

What causes coronary heart disease and what can we look forward to?

Coronary heart disease is a multifactorial disorder that can have many causes, including stress, homocysteine, infections, and free radical damage. Other contributing factors that influence susceptibility range from family history, age, gender, diabetes, hypertension and smoking, to sex hormones, obesity, physical activity, and alcohol consumption. Many of these are interrelated and some individuals have more than one. It would be naive to believe that CRP levels reflect an accurate assessment of these diverse risk factors, or that lowering CRP will safely and effectively reduce coronary mortality in healthy people. Association never proves causation. Treating an elevated CRP would simply repeat the same mistake made by attempting to lower LDL and/or raise HDL based on the fallacious belief that these are bad or good.

Cholesterylster transfer protein (CETP) drugs that substantially increase HDL have failed to reduce the risk of atherosclerosis in two trials that either caused an increase in deaths (torcetrapib), or showed no clinical improvement despite significant HDL increases (dalcetrapib), but others are in the pipeline. PCSK9 monoclonal antibody inhibition is being developed for patients on statins who have not obtained optimal LDL levels. These PCSK9 inhibitors are given by injection every 2 to 4 weeks; with an anticipated initial cost of $6 000 to $7 000/year, and long-term safety and efficacy has not been established. The FDA approved apheresis for the treatment of high cholesterol in 2013; this is a procedure that removes LDL, VLDL and Lp(a) bad cholesterol from the blood by direct adsorption. Like kidney dialysis, the 2-3 hour treatment must be repeated weekly or every 2 weeks at a cost of $2 500/treatment (although there may be insurance coverage if the LDL is over 300 mg/dL or over 200 mg/dL in patients with coronary disease not responsive to statins).

Einstein had a large sign on the wall of his Princeton office with the following warning: “Not everything that can be counted, counts, and not everything that counts can be counted.” The first part of this statement applies to CRP and LDL, which are easy to measure, but may have little significance. The second part pertains to our inability to define, much less measure something we call “inflammation”, but which may include different types of pro-inflammatory processes. I am not optimistic about future progress, as there is so much money to be made by perpetuating the cholesterol hypothesis, instead of doing proper research and unbiased investigations. As Upton Sinclair noted, “It is difficult to get a man to understand something, when his salary depends on his not understanding it.”
Supermagnetic Field

or

‘Supermassive Black Hole’

Huge magnetic fields in a quasar where a ‘supermassive black hole’ is supposed to be gives the lie to Big Bang theory and strong support instead for the Electric Plasma Universe  

Dr Mae-Wan Ho

Black holes and gravitational waves, do they really exist?

In accordance with the prevailing Big Bang Theory of cosmology based on gravity and Albert Einstein’s theory of general relativity, and as ‘proven’ by the powerful Hubble space telescope, a supermassive black hole is at the centre of most if not all large galaxies. Quasars - extremely bright energetic objects once thought to be star-like - are also found at the centre of galaxies, and ‘most scientists’ believe that quasars are powered by the supermassive black holes.

Note that black holes by definition cannot be seen, they are ‘so dense, and with so much mass, that even light cannot escape their gravity.’ But the Hubble made it possible to see the ‘effects of the gravitational attraction’ of black holes on their surroundings. In other words, the observation of black holes is at best indirect, based on what a black hole might do to its environment, and indeed, proposed in order to ‘explain’ the observations.

A University of Illinois archive states: “For example, if gas from a nearby star were sucked towards the black hole, the intense gravitational energy would heat the gas to millions of degrees. The resulting X-ray emissions could point to the presence of the black hole.” However, it admits that “such evidence remains indirect and therefore inconclusive. To confirm that black holes actually exist, we’ll need to be able to observe the gravitational waves they produce as they form or interact [with nearby matter].”

Gravitational waves were also predicted by Einstein’s theory of general relativity in 1916. Now, nearly a century later, no gravitational waves have ever been detected and not for want of trying; the latest attempt involving 900 scientists was announced in February 2015, promising results by January 2017.

Despite the lack of evidence, most cosmologists are adamant that black holes actually exist, and are exceptionally hostile to any other explanation; for example, the possibility that the highly energetic effects attributed to black holes may be due to electric and magnetic forces as proposed in the theory of the Plasma Universe, or Electric Universe, which can much better explain the avalanche of ‘surprises’ (to Big Bang theory) from increasingly detailed astronomical observations in the entire range of the electromagnetic spectrum (see Continuous Creation from Electric Plasma versus Big Bang Universe, SiS  60).

The newly discovered supermagnetic field where a supermassive black hole is supposed to reside is the strongest evidence yet in
Supermagnetic field discovered near supermassive black hole

The team led by Wolfram Kollatschny at the Institute for Astrophysics of Göttingen University in Germany have found supermagnetic fields ~200 million Gauss close to the supermassive black hole of the quasar PG0043+039. Active galactic nuclei (AGN) and quasars emit enormous amounts of light at all frequencies ranging from the radio to the X-ray. PG0043+039 (redshift $z = 0.38512$, see Box 1) is unusual in that it emits very weakly in the X-ray.

Thanks to the Hubble telescope, the researchers were able to observe the quasar PG0043+039 in ultraviolet (UV), where spectroscopic lines unknown to date were identified, which they attributed to cyclotron lines. “Cyclotron lines are produced by electrons that take on spiral trajectories around the field lines of very strong magnetic fields,” explains Kollatschny. In addition to the Hubble, the team used giant optical land-based telescopes in Texas, USA, and South Africa, and the largest X-ray satellite of the European Space Agency, ESA XMM-Newton, which they focussed onto the quasar for ten hours.

In Big Bang cosmology, it is supposed that in quasars and active galactic nuclei at the centre of galaxies, matter is subjected to extreme acceleration and heat as it falls into the centre of the supermassive black hole (see above). This produces extreme luminosity in the immediate surroundings of the black hole, the radiation normally coming in all frequency ranges from radio to X-rays. The matter that disappears into the black hole is never seen again ‘except for some of it that’s catapulted into space in jets’ (how that’s supposed to happen when nothing can escape from the black hole is not clear).

In PG0043+039, the supermassive black hole and super strong magnetic field are “in direct proximity”, according to the researchers.

Unusual bumps in the UV emission lines

Besides known emission lines such as the Lyα (hydrogen atom) and OVI (oxygen) $\lambda$1038, broad line humps (line widths $\sim 10000$ km s$^{-1}$) with shapes different from those of normal emissions can be seen in the UV spectrum. These were assigned to cyclotron emission lines. This is by no means the first time that cyclotron emission lines have been observed. Cyclotron emission lines have been established in the UV, optical, and infrared spectra of AM Herculis stars that belong to a unique class of ‘cataclysmic variable stars’ in which the magnetic field of the primary star, a white dwarf, completely dominates the accretion flow of the system. Typical magnetic field strengths are $3-15 \times 10^7$ G (Gauss) in the inner magnetic accretion regions. (For comparison, Earth’s magnetic field is $\sim 0.5$ G.) In the standard model for accretion onto a magnetic white dwarf, an adiabatic (process without heat exchange) standing ‘shock wave’ forms in the accretion column above the surface of the white dwarf at high supersonic speeds. In the ‘shock’ region, the kinetic energy is transformed into thermal energy and the matter is slowed down into a subsonic settling flow. During this process, the matter in the settling flow is heated to a shock temperature of $10^{10}$-$10^{10}$ K. The hot matter in the settling flow is then cooled down by thermal radiation and/or cyclotron radiation in the UV to near IR range.

Magnetohydrodynamical ‘shock’ formation is thought to be possible, for example, in equatorial/non-equatorial plasma flows close to the black-hole event horizon (where nothing, no light nor matter, can return). Shocks in these plasmas might be responsible for creating very hot $T \sim 10^8$ K and/or strongly magnetized plasma regions. These shocks could be the origin of cyclotron radiation similar to the origin of cyclotron radiation connected to shocks in CV (cataclysmic variable)
stars, a binary with one white dwarf (primary) and a mass transferring secondary (see above).

The researchers used a program originally developed for cyclotron radiation emitted from standing shocks above accreting magnetic white dwarfs with the dimensionless parameter \( \Lambda = 4 \pi n_e l / B \), where \( n_e \) is the electron density and \( l \) the size of the line emitting region. It is interesting that they needed two cyclotron systems called A and B for modelling the UV emission humps (see below).

The best fit to the observations yields plasma temperatures of \( T = 3.8 \) keV for system (A) \( (T \approx 4 \times 10^7 \) K) and \( T = 1.9 \) keV for system (B) \( (T \approx 2 \times 10^7 \) K); the corresponding field strengths of \( B = 1.95 \times 10^8 \) G for (A) and \( 1.45 \times 10^8 \) G for (B) with log \( \Lambda \) values of 4 and 7 respectively. This corresponds to line emitting region sizes of \( 10^{15} - 10^{18} \) cm\(^2\) for assumed density values of \( n_e = 10^{15} \) cm\(^{-3}\).

**Cyclotron emissions from strong magnetic fields generated by galaxy formation in the Plasma Universe**

The researchers may have found the right answers for the magnitude of the magnetic fields, but the explanation is far from satisfactory. Cyclotron lines are emitted by non-relativistic (velocity not a significant proportion of the speed of light) electrons in strong magnetic fields; that is generally accepted. Cyclotron emission occurs at
In the Plasma Universe, the electrons involved are in plasma currents flowing in spiral paths along the magnetic field generated, instead of being orthogonal to it. Field-aligned currents (FACs), also called Birkeland currents after Norwegian scientist Kristian Birkeland (1867-1817) who proposed that atmospheric electric plasma currents were responsible for the aurora borealis (northern lights).

Swedish Nobel laureate astrophysicist Hannes Alfvén (1908-1995) was a leading proponent of the idea that the universe is created out of plasma clouds that make up more than 99.9% of the universe as they generate and respond collectively to electromagnetic fields. Alfvén was the first to point out that electrons accelerated in spiral paths along FACs especially by electric double layers (of separated positive and negative charges) would be expected to emit cyclotron radiation in all frequencies from radio waves to X-rays.

Plasma FACs can be any size from millimetres and centimetres in the laboratory to hundreds of metres and kilometres in Earth’s aurora, to parsecs (1 parsec = 3.08567758 × 10^16 metres) and Mparsec at interstellar and galactic dimensions. The beauty of such plasma currents is that they behave in self-similar fashion over all scales, as characteristic of fractal processes (with dimensions between the whole numbers 1, 2, 3, or 4). In that way, results in the laboratory and indeed from planetary observations on Earth can be extrapolated to galactic and intergalactic domains.

American plasma and nuclear physicist Anthony Peratt now at Los Alamos National Laboratory, New Mexico, proposed that galaxy-formation involves the interaction of 2 to 3 FACs (some 35 – 50 Mparsec in diameter, and on average 350 Mparsec long) that attract each other to form a centre (galactic nucleus) around which the galaxy arms (the rest of the FACs) spiral. Computer simulations showed that the evolving galaxy changes in morphology and emissions, depending on the state of two interacting FACs. It begins with radio and microwave emissions when they are still some distance apart, progressing to the infrared, visual, UV and X-rays, as they form closer and closer together and coalesce after hundreds of million-years. The mutual excitation of the currents increases, generating ever stronger magnetic fields that ‘pinch’ the plasma so strongly that matter can be ejected in long jets. The centre or nucleus of a galaxy is indeed a very strong magnetic field that can account for all the observations without the need of a ‘supermassive black hole’.

It is interesting that the Göttingen University research team found it necessary to fit the data to two systems, A and B, perhaps belonging to two different FACs that have come together to form the quasar. The fact that PG0043+039 emits weakly in the X-ray region may be an indication that it is a young galaxy.

In the Electric Plasma Universe, therefore, black holes are redundant, as gigantic plasma field aligned currents (FACs) are responsible both for generating the strong magnetic fields and also for the concentration or accretion of matter.

Most recently, regular magnetic fields much weaker in strength (less than a microGauss to tens of microGauss) have been measured between the arms of spiral galaxies. Astronomers carrying out a detailed multi-telescope study of a nearby galaxy IC 342 discovered a magnetic field coiled around the galaxy’s main spiral arm (Figure 1). The study, they claim, shows how “gas can be funnelled inward toward the galaxy’s center, which possibly hosts a black hole”.

“This study helps resolve some major questions about how galaxies form and evolve”, said Rainer Beck of the Max Planck Institute for Radio Astronomy in Bonn, who led the study. “Spiral arms can hardly be formed by gravitational force alone. This new IC 342 image indicates that magnetic fields also play an important role in forming spiral arms.”

Although Beck has acknowledged the role of magnetic fields in the formation of galaxies, his interpretation falls short of the prediction from the Plasma Universe. The spiral arms are the original FACs that joined up to form the galaxy, thus, there is no need to account for their existence independently. Furthermore, their role is not to funnel matter “towards the centre of the galaxy”. The accretion of matter occurs throughout the entire FAC to form stars and planets, and the matter is accreted precisely to where the magnetic field spiralling around the electric current goes through its minima as it cyclically reverses direction, as predicted from a quantitative model of the FAC (Birkeland current) by retired electrical engineer and leading proponent of the Electric Universe Donald Scott at University of Massachusetts, Amherst.

The accretion of matter occurs throughout the entire FAC to form stars and planets, and the matter is accreted precisely to where the magnetic field spiralling around the electric current goes through its minima as it cyclically reverses direction, as predicted from a quantitative model of the FAC.

To conclude

Supermagnetic fields at centres of galaxies and quasars are a direct consequence of galaxy formation via the interaction of gigantic field-aligned plasma currents. These supermagnetic fields account for all the emissions observed as well as for the morphologies of the galaxies and other energetic phenomena without the need of post hoc ‘explanations’ in terms of supermassive black holes and other hypothetical unobserved and unobservable entities.
Interview with

MAE-WAN HO

From genetics and GMOs to quantum biology and cosmology Mónica Fernández
(A longer version in Spanish is published in issue 61 of La Fertilidad de la Tierra, June 2015)

SCIENCE IN SOCIETY 67 AUTUMN 2015
the whole to its parts. Paradoxically, when it reached the limits of mechanistic reductionism, quantum physics turns up to tell us in no uncertain terms that nature cannot be reduced. The knower is irredubitably entangled with the known, and we are all, from fundamental particles to people to stars and galaxies, all inseparably entangled with one another. Even more fundamentally, quantum physics is telling us that nature cannot be understood as a gigantic clockwork machine assembled from decomposable parts; instead nature is an organism *par excellence*, in which part and whole are mutually entangled and inseparable, and can only be understood with the sensitivity of an organism. Western science has redeemed itself in the quantum revolution, but most practitioners do not know it yet, and neither does western society at large. I wrote an article entitled “Towards an indigenous western science” many years ago (https://www.academia.edu/11844982/Towards_an_Indigenous_Western_Science_Causality_in_The_Universe_of_Coherent_Space-Time_Structures), which attempts to spell out the implications of quantum physics for science and society.

Monica: Is “science for the public good” an achievable goal? How can we make it?

Mae-Wan: Once we fully embrace the implications of the quantum revolution in western science and science as reliable (indigenous) knowledge of nature that enables us to live sustainably with her, science for the public good is taken for granted, it will be like second nature to us. And by public good, I don’t mean just being ethical, useful, and ecological, I also mean being inspirational.

Monica: What’s ISIS’ role in bringing science closer to society? Why this mission?

Mae-Wan: ISIS’ role is to bring science into society, as part and parcel of general culture. On a practical level, we provide critical, accessible and reliable scientific information to the public and policy makers, we promote social and ecological accountability, and above all, we aim to recover truth and beauty in science as in art. We have several in-house artists including myself.

Monica: As a geneticist, can you tell us about the consequences of eating genetically modified foods for human health?

Mae-Wan: When I first warned about genetic modification (GM) twenty years ago, there were already many uncontrollable, unexpected effects found in genetically modified organisms (GMOs): deformed plants and animals, unexplained toxins and allergens. This highlights the mismatch between a mechanistic, reductionist mindset that presupposes genes determine functions in linear causal chains so they can be changed one at a time without affecting anything else and the organic reality of circular causation in the ‘fluid genome’ where the functions of genes are inextricably entangled with one another and with the environment in complex feed forward and feedback loops that can mark and change the genes themselves. I said this mismatch was the greatest danger of GM then (see Genetic Engineering Dream or Nightmare, ISIS publication), and it remains so now 20 years later when there is abundant evidence of harm from GM.

Wherever and wherever scientists independent of the biotech industry carry out feeding trials in the laboratory, they find liver and kidney problems in their animals, stuntng, birth defects, excess deaths, infertility, tumours, and cancers, confirming what farmers have been experiencing themselves and witnessing in their families and their livestock, and doctors have been documenting the illnesses in people living near GMO fields for years (see Ban GMOs Now, ISIS Report). In the United States, where there is still no labeling of GMOs, the government’s own data show a marked deterioration of public health, with dozens of diseases rising in parallel with the sharp increase in GM crops and glyphosate herbicide use (see Maked Deterioration of Public Health Parallels Increase in GM Crops and Glyphosate Use, Government Data Show, SIS 65). The causes of harm from GM feed and food are diverse: they certainly come from glyphosate herbicides used with glyphosate tolerant GM crops; glyphosate has just been recognized as a probable carcinogen in the World Health Organization’ latest evidence-based assessment (Glyphosate “Probably Carcinogenic to Humans” Latest WHO Assessment, SIS 66), and has numerous other toxicities including endocrine disruption. Harm can come directly from the transgenes incorporated, or indirectly through new proteins and nucleic acids created as a consequence of the insertion of transgenes. Furthermore, the synthetic GM DNA inserted is unstable and can jump around the genome of the GMO to create more harmful effects. Most of all, the GM DNA can jump into the genome of all species of organisms interacting with the GMO, as for example, animals including humans eating the GMO. GM DNA jumping species is called horizontal gene transfer. It is a main route for spreading antibiotic resistance genes (contained in most GM DNA) making infections untreatable, and for creating new viruses and bacteria that cause diseases. GM DNA inserting into genomes can also wake up dormant viruses and activate cancer-causing genes.

People may find it paradoxical that practically all the processes employed by human genetic engineers in the laboratory to create GMOs are actually used by the organisms themselves in their everyday life, and this natural genetic modification is absolutely necessary for survival. The important difference is that the natural genetic modification carried out by the organism themselves is precisely orchestrated and limited in its effects, whereas it is negotiated by the organism as a whole in relation to its environment. In contrast, artificial genetic modification is crude and imprecise, without regard to context and cause a lot of collateral damage. That is the main reason why artificial genetic modification can almost never be safe (see Why GMOs Can Never be Safe, SIS 59). The new breed of ‘synthetic biologists’ are promising precise genome editing as the way forward in artificial genetic modification, but off-target effects continue to dog the most sophisticated attempts so far.

Monica: Is organic agriculture one of the solutions to climate change? Can this productive system react better to climate change effects?

Mae-Wan: Organic agro-ecological small-scale agriculture is the key solution to food security under climate change, as we have documented in a comprehensive report published in 2008 (Food Futures Now -Organic -Sustainable -Fossil Fuel Free, ISIS Report). Study after study since, including the most thorough international IAASTD assessment (http://www.unep.org/dewa/assessments/ecosystems/iaastd/tabid/105853/default.aspx), has confirmed greater productivity, savings on energy and carbon emissions, more nutritious food, more earnings for farmers, and above all, improved tolerance and resilience to climate extremes such as hurricanes, floods, and droughts.

Monica: Could stop eating meat and raising livestock be part of the solution to climate changes attributed to farming? How does this relate to the pasture-herbivore symbiosis and the capacity of pastures to capture excess CO2 emissions?

Mae-Wan: No, we do not have to stop eating meat. We need to substantially reduce meat in our diet. Most of all, we need to stop intensive cattle-raising on grains in industrial feedlots. Organic, well-kept permanent pasture and extensively raised cattle with paddock grazing is highly sustainable, and also sequesters carbon in the deep roots of grasses. We must not destroy natural grasslands and turn them into fields to grow soya or maize for intensively fed cattle; and we must not cut down forests for growing soya. Yes, the pasture-herbivore symbiosis practiced for thousands of years is the answer, along with sustainable agro-forestry and other agro-ecological practices that depend on maximizing local biodiversity and productivity. That is the way to health of the land, and food security and health for people.

Monica: One of the main issues with climate change is the depletion of one of our most irreplaceable resources: water. Can we prevent the “water crisis”? 

Mae-Wan: Yes we can prevent the “water crisis” with a diversity of local technological solutions and innovations that reduce the use of
water in agriculture, industry and homes; that prevent pollution of water resources and run-offs, rain-water harvesting, recycling and regenerating waste water (for some examples of innovations in agriculture (see Securing Water for Food, SiS 65). The key is small, diverse and local, with appropriate policies that ensure equity of access to water for all, and protecting and enhancing public water resources is in everyone’s interest.

Monica: What is liquid crystalline water and why isn’t this state of water recognized widely in conventional science?

Mae-Wan: You are now asking about the liquid crystalline state of the water my colleagues and I first discovered in living organisms, in cells and tissues, more than 20 years ago. It is water in an ordered and excited state adsorbed on the surfaces of cell membranes and macromolecules that makes life and living biochemical processes possible, as described in my books, The Rainbow and the Worm - The Physics of Organisms, and Living Rainbow H2O, ISIS publications). It has remained my major research area and inspiration. It is important to realize that the ordered excited state of water – quantum coherent water - already exists in ordinary bulk water and is merely stabilized by the surfaces, the interfaces. Water is at the base of the organic perspective in the quantum revolution of Western science, it is radically non-mechanistic. It is spontaneous and free-flowing, sensitive and responsive, accommodating and flexible, yet effective and powerful. And of course, all indigenous sciences are organic and non-mechanistic.

Monica: Beyond being free of toxic substances and impurities, is it significant for irrigation water to be “liquid crystalline” in relation to the health and productivity of food crops? How can a farmer get this type of water?

Mae-Wan: Water has its own geo-cycle, which is different from its cycle within living organisms. Rain-water needs to percolate deep into the ground through many layers of soil and rock, changing in temperature and density, dissolving rock minerals on its way, to surface again as spring water laden with minerals, which is the best kind of water to drink for health. Rainwater feeds plants naturally; plants have their own way of managing and conditioning water that is distinct from animals. Trees create rain, that’s why we have rain-forests. They are needed for regenerating oxygen and fixing carbon dioxide, and also for watering crops. It is sufficient that water for irrigation should be free of toxic substances and impurities, and it should be used very sparingly as in drip irrigation. You do not need special liquid crystalline water (as I said, liquid crystalline water already exists in ordinary water). Having said that, there is still a great deal about water we do not yet understand. There have been many claims that specially activated water, by treatment with magnetic or electromagnetic fields, can prevent pipes clogging up with precipitates, or have special growth promoting properties for crops. All that needs to be properly researched.

Water comes in infinite structural forms because it is very flexible. It is also extremely responsive to its environment, to electromagnetic fields or light. It has all the hallmarks of sentience, and I
have no doubt that water is the real seat of consciousness in living organisms and possibly the universe at large, as water is the most abundant compound in the universe, being created continuously since the universe was born... that’s another story.

Mae-Wan: Technically it is called circular thermodynamics, thermodynamics goes in cycles, and is recycled to minimize waste and dissipation.

Mae-Wan: Yes indeed, saline agriculture is going to be very important (see Saline Agriculture to Feed and Fuel the World, SiS 42), both for food security and flood defence. There are many naturally salt tolerant species already, and more are being discovered and perfected for example, salt and flood tolerant rice (Feeding China with Sea-rice 86, SiS 65). Sea water has many plant nutrients (especially micronutrients) washed away from land by runoffs, and saline agriculture is a good way to recover and recycle those nutrients.

Mae-Wan: Circular economy is nature’s own economy. Everything goes in cycles, and is recycled to minimize waste and dissipation. Technically it is called circular thermodynamics, thermodynamics being the transformation of material and energy, or economy by another name. It is how nature continually recreates and renews itself, how individual organisms transform material and energy to regenerate and recreate themselves from moment to moment, and to reproduce the next generation in life cycles. It is the essence of sustainability. That’s what the ‘green economy ought to be like’, instead of the linear maximum waste and dissipation economy we have. Many businesses and industries are already designing for reuse and recycling along the lines of a circular economy, minimizing waste and pollution of the environment.

Mae-Wan: In the same way, organic, agro-ecological agriculture integrates itself into nature’s circular economy by maximizing internal input and symbiosis, transforming wastes back into food and energy resources. All sustainable farms are run according to a circular economy. In the simplest form, the farmer grows crops and keeps cattle on grass and crop wastes, the cattle provide manure to fertilize the crops. You can make the farm bigger, add sheep, which can feed after the cows have taken the first grazing and then put in chickens that will find a rich picking of insects in the manure. You can keep fish in fishponds, and feed them on grass and crop wastes, and fertilize and water the crops with the fish water. Farmers have invented all manner of circular economy farms. One common example is putting ducklings and fish into rice paddies for weed control and fertilization. I have written at length about this in Food Futures Now *Organic *Sustainable *Fossil Fuel Free, including a complete version of a food and energy self-sufficient Dream Farm that incorporates renewable energies and anaerobic digestion to recycle waste into nutrients and biogas energy while preventing pollution of the environment. In The Rainbow and the Worm - The Physics of Organisms, I develop the more technical aspects of circular thermodynamics.

Mae-Wan: Yes, some quantum physicists including me regard the universe as quantum coherent, just as organisms are quantum coherent. That essentially means that the entire universe is radically interconnected through a range of space time scales from very fast to extremely slow, from sub-microscopic to inter-galactic. Since the beginning of agriculture perhaps 10 000 years ago, farmers have sowed and harvested according to seasons and some have been guided by a more sophisticated calendar based on precise conjunction of celestial bodies. Experiments have been done in biodynamic farming showing that the precise time of sowing does make a difference. Again, we need a great deal more research. A lot of local knowledge has already been lost, and it is time for scientists to learn and work together with farmers to preserve and consolidate local knowledge.

Mae-Wan: Going even further into the implications of quantum coherence, could there be a connection between a farmer’s intention/thoughts (her state of mind, her beliefs, etc) and the health and nourishing properties of the plants and animals she cares for?

Mae-Wan: It is entirely possible for a farmer’s intention to influence the plants and animals she cares for. Animals and plants are very sensitive and responsive to good intentions. There is already a lot of evidence that our state of mind influences the expression of our genes, and it would be surprising if happy plants and animals do not also alter the expression of their genes.

Mae-Wan: What are you working on at this moment and which are your plans for future projects related to agriculture?

Mae-Wan: Ah, my life project is really the meaning of life, the universe, everything! I have just published a paper with two theoretical physicists on cosmology, which was my first love. It took me a while to get there. The paper is very mathematical (at least half of the mathematics I don’t really understand). The paper “Is spacetime fractal and quantum coherent in the golden mean?” can be found here: https://www.academia.edu/10953909/Is_spacetime_fractal_and_quantum_coherent_in_the_golden_mean

I am not an agriculturist and only grow vegetables and herbs in my little garden when I have time. I am only a scientist inspired by science and interested in making science serve people and planet in every way; so I have made it my business to learn about sustainable agriculture in practically every country I have visited.

Mae-Wan: Finally, could you share any good news regarding science and society with our readers?

Mae-Wan: Well, the good news is that science is winning, and in every field. Many more scientists are standing up for science now than when I first began in 1994. There were only a handful of us warning against the dangers of GMOs. I soon discovered that GMOs are not unique. In every single field, vested interests are bending and manipulating science to suit their purposes, to sell their products, from mobile phones to pharmaceuticals to fossil fuels. That was why Peter Saunders and I cofounded the Institute of Science in Society to recover science in general for public good. Regarding GMOs, farmers in the USA, the biggest producer by far in the world, are turning back to non-GM crops in record numbers in 2015, basically because consumers everywhere are aware of the health hazards, and non-GM produce are more profitable, because there is a premium on them, and there is no technology fee to pay. Furthermore, GM traits have failed against rising tides of herbicide resistant superweeds and Bt resistant insects (see http://nationalsociety.com/ record-us-farmers-switching-non-gmo-crops-2015/). The rest of the world should now stand firm in their rejection of GMOs.

Mae-Wan: The best of the good news is the beginning of the end for fossil fuels, the successes of renewables are unstoppable, and 100% renewables is now on the climate change agenda (see Age of Oil Ending? SiS 66). This goes hand in hand with sustainable agriculture. Science is with the people and we are marching toward a sustainable, equitable future for all. Politicians and governments need to wake up and follow the people.
Genetically Modifying Genes & Scientific Evidence


According to the advocates of genetic engineering, GMOs have been proven by countless rigorous trials to be safe, no humans or even animals have ever been harmed by them, genetic modification is no different from the natural and artificial breeding that has been going on for millennia, it has produced crops with all sorts of desirable properties such as drought resistance, we cannot hope to feed the world without it, and so on.

These statements are all false. And in Altered Genes, Twisted Truth, Steven Druker, a lawyer, shows them to be false exactly as if he were in a courtroom. He has collected a vast amount of documentary evidence: scientific papers and also internal reports and memos. He has interviewed many of the people who were involved and he explains the science so that lay readers can follow the arguments.

The book is a surprisingly good read, considering how long it is and the amount of detail it contains, but it is also a valuable reference text. When the GMO lobby confidently state that genetic engineering is the same as ordinary breeding, this is where you can learn why it is not. When they describe the work of Arpad Pusztai or of Gilles-Eric Seralini as ‘discredited’, you can find out what actually happened, and why neither result has ever been properly challenged, let alone refuted.

It’s not just a matter of one person’s word against another. Unlike the GM lobby, Druker presents solid evidence for what he claims. It’s there in detail and it is fully referenced; you are welcome to check it for yourself.

To give you a flavour of the book, here are brief outlines of two of the early chapters, one on Asilomar and one on tryptophan. Both stories are very important in the history of genetic engineering, but they are seldom mentioned today. When they are, the usual spin is that a few scientists raised their concerns at a meeting but soon accepted that these were unwarranted, and that the tryptophan incident had nothing to do with GM. In both cases, the truth is quite different.

Asilomar
Forty years ago, when transferring genes from one organism to another was first becoming a standard research technique, scientists naturally began to worry about its potential hazards. The US National Academy of Sciences (NAS) appointed a commission to look into the issues, and this led to a letter to the journal Science and then, in February 1975, a meeting of over a hundred scientists at the Asilomar Conference Center in Monterey, California. The outcome was a statement with a list of safety guidelines, including the requirement that research should be carried out using only disabled bacteria that could not survive outside the laboratory. Just the sort of thing you would expect when there is a possibility of danger. Chemists, after all, work in specially designed laboratories, not out in the open, and they have to make special arrangements to dispose of the waste from their experiments; they are not allowed to pour it down the sink and into the public sewers.

The Asilomar guidelines were, however, soon abandoned. They are seldom mentioned today, and if you have heard of them at all you’ve probably been told that while they were an understandable reaction to a new technology, they were soon shown to be unnecessary because it was conclusively demonstrated that the techniques pose no significant hazards.

Druker, who has looked carefully through the published records and interviewed many of those who were around at the time, tells a very different story. One of his key points is that the claim that genetic engineering was safe was largely based on research involving only one bacterium, E. coli K-12. But K-12 had been used in laboratories for many years and was relatively weak, i.e. it would be unlikely to survive outside the laboratory. So while the release of a genetically modified K-12 into the environment might not be dangerous, that would be reassuring only if all future research were confined to K-12. Even then, there would remain the risk that the transferred gene would pass into another, stronger organism.

Yet molecular biologists used, and continue to use, this evidence to justify their claim that genetic engineering involves no special risks and that GM organisms require no more testing than those that have been conventionally bred; they are, in the words of the US Food Additive Amendment of 1958, “generally recognized as safe” (GRAS) and consequently exempted from testing.
It’s easy to understand why so many molecular biologists, rushing to push ahead in what they saw as an important and exciting new area, allowed their enthusiasm to cloud their judgement. They could also see the prospect of turning their research into profit, and that made them even less anxious to think about the dangers. Crucially, they managed to convince the Reagan administration that there was money to be made and jobs to be created and that the US must not be left behind. That, combined with the Reagan-Thatcher policy of relaxing all regulation – in banks as well as in molecular biology – made support for genetic engineering a part of government policy. The US government has consistently backed the GM industry and has used its strength to pressure other countries into accepting GM crops. The Asilomar guidelines and the concerns that led to them have been totally forgotten.

Druker gives many examples of how scientists working for regulatory bodies such as the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) were pointing out the dangers of GM but, to their great frustration, only to have their concerns dismissed by their bosses. They were right to be frustrated, but they should not have been so surprised. Once a government has decided on a policy, it expects all its employees – scientists as much as anyone else – to support it; In the words of a policy adviser to the President of the European Commission, from that point on “scientific evidence is less up for debate” (see Politically Correct Science for the Masses, SIS 61).

The chief role of a regulator is to ensure a level playing field among producers by preventing anyone gaining an advantage by doing something that the consensus within the industry agrees is unsafe. Whether that consensus is right or not is a different matter altogether. Governments and industry are always trying to assure us that the regulators are there to protect the public but this is true only in a limited sense.

Tryptophan

In 1989, physicians in the US began to report a new disease that typically involved severe muscle and joint pain and swelling of the legs and arms, sometimes with more serious symptoms as well. It was soon found that all the victims had been taking an amino acid, L-tryptophan (LT) as a supplement, and while a number of companies were producing it, all the people suffering from this new disease had been taking LT supplied by one manufacturer, Showa Denko KK. And Showa Denko was the only manufacturer using genetically modified bacteria in the production process.

Like the Asilomar guidelines, the story of tryptophan is seldom mentioned today. If it is, we are assured that problem with LT was nothing to do with genetic engineering. The batch had become contaminated during processing; the fact that it had been produced by GM bacteria was irrelevant.

Druker describes in detail, and refutes, the many arguments used by the FDA in an attempt to rule out GM as a cause. And it was the FDA - which we expect to be striving to protect public safety - that was working so hard to defend genetic engineering. Showa Denko were not really interested in arguing about what had gone wrong because they were going to have to pay compensation whatever the cause turned out to be.

To give just one example of the efforts made to cloud the issue, the GM lobby has always claimed that while the epidemic occurred only after the GM bacteria known as Strain V were introduced, there were in fact some cases of EMS that occurred before that. That might seem to rule out genetic modification as a cause, except that – as the name suggests but the FDA somehow omitted to mention – there were four earlier strains of the bacteria and all but the first were GM. Contrary to what the FDA claimed, all the LT supplied by Showa Denko had been produced using GM bacteria.

In the light of all the evidence that Druker so meticulously documents, it is hard to reach any conclusion other than that it was the use of GM bacteria that caused the EMS outbreak. But that’s not the story that we are told today.

More examples

The rest of the book is no more edifying than these early chapters. Druker shows in detail how regulatory agencies all over the world have misused the evidence and twisted the truth to allow GM crops to be grown without restriction. For the most part they have not carried out their own research but relied on assurances from the industry. He describes how two scientists, Arpad PusztaI and Gilles-Eric Séralini, who had the courage to report what they had found, were attacked by the biotech industry and its friends in the science academies. Those scientists who have been so ready to jump on the pro-GM bandwagon would do well to read Druker’s book, and find out what it is they have committed themselves to. They could begin by reading the papers by PusztaI and Séralini, which most of them clearly have not done. (That explains why so many of them criticise Séralini for not following the OECD protocol for experiments on cancer when in fact his research was concerned with toxicity, for which the protocol is different. You only have to read the title of the paper to discover that.)

Altered Genes, Twisted Truth was published early in 2015, but there are already at least two more examples that could have been added. They are about glyphosate, and are relevant to GMOs because one of the most profitable applications of genetic engineering has been to produce varieties of maize, soya and cotton that are tolerant of glyphosate, the active ingredient of many herbicides including Monsanto’s Roundup.

It was recently announced that an EU study has concluded that glyphosate is safe. The announcement explained that the European Commission had delegated the work to Germany as “Rapporteur Member State.” What it did not explain was that the German Federal Institute for Risk Assessment had delegated it to a body called the Glyphosate Task Force, which according to its web site is a consortium of chemical and biotech companies “joining resources and efforts in order to renew the European glyphosate registration with a joint submission.” It’s like asking the fox to advise on the security of the henhouse (see Scandal of Glyphosate Re-assessment in Europe, SIS 64).

The International Agency for Research on Cancer (IARC) has recently published a report in which a panel of 17 experts from 11 countries and chaired by Aaron Blair, formerly the top scientist on pesticides and cancer at the US National Cancer institute, unanimously agreed to reclassify glyphosate as “probably carcinogenic to humans” (Glyphosate ‘Probably Carcinogenic to Humans’ Latest WHO Assessment, SIS 66).

Monsanto immediately demanded that the report be retracted; this seems to have become their standard response to any scientific result they do not like. But the IARC is part of the WHO, and the WHO refused to be bullied. The report remains a WHO document and it is already starting to have an effect. At the time of writing, Colombia has stopped spraying glyphosate to destroy cocoa crops, Bermuda and Sri Lanka have banned the import of glyphosate products, and consumer protection ministers in Germany have called for a ban on their use by private individuals (see Fallout from WHO Classification of Glyphosate as Probable Carcinogen, SIS 67).

To conclude

Altered Genes, Twisted Truth makes some demand on the reader, but requires little in the way of previous scientific knowledge. Anyone who reads Science in Society will have no difficulty with it and will learn a great deal, whether they are scientists or not. Druker’s primary target is the decision makers.

If they are in favour of GMOs, as many of them are, that is because they have been advised by experts but failed to take into account that experts have their own agendas. If you have built up a career in some branch of science, and even more so if you have a financial stake in it, it is only to be expected that you will be very optimistic about its potentialities and inclined to play down its drawbacks, especially its dangers. Druker is not asking the decision makers to believe him instead of their advisers. He is inviting them to read the evidence for themselves and make up their own minds. That, after all, is what decision makers are there for.
Sceptical Doctoring vs Doctoring Data


Prof Peter Saunders

You can hardly pick up a paper or turn on the radio or TV without being bombarded with advice on how to stay healthy. You should eat less, and especially less salt, sugar and saturated fat. You should drink less alcohol, and what you do drink should be red wine. You should stop smoking. You should not go out in the sun without a big hat and special sun lotions.

If you go to the doctor, not only will you get much the same advice, you will often be prescribed drugs of one kind or another, not because you are ill but because your blood pressure or your cholesterol level is too high. If you are a woman, you will be urged to undergo screening for breast or cervical cancer, or prescribed hormone replacement therapy if you are at or past menopause. If you question the doctor about this, you will probably be told that he or she is following approved guidelines based on scientific research. There may well have been pressure on your doctor to get all their patients to participate.

Malcolm Kendrick is a doctor who has come to be sceptical about this plethora of advice. Some of it is certainly correct; the evidence that smoking is bad for your health is overwhelming. But when he started to look for the evidence to back up many of the other things we’re told, he found a lot of it ranged from flimsy to non-existent. Many of the benefits, even where they appear to be real, are so small that they’re not worth the effort, especially when balanced against side effects.

The truth is that the experts don’t know as much as they would like you to think. Worse, many of them have got vested interests in getting you to follow their advice, especially about drugs. Bearing in mind that we don’t all have the same view of what is or is not an acceptable level of risk, and how much interference with our normal lives we are willing to tolerate, we’d be better off listening to what the experts say and then deciding for ourselves.

The truth toolkit

Of course we have to be able to decide whom to trust. So Kendrick provides what he calls a “truth toolkit”: ten things you should remember when you hear a story about health:

1. Association does not mean causation. If people who eat more red meat have a higher risk of heart disease, does that mean that eating red meat is bad for your heart? You might think so, because a study from Harvard found that people who eat more red meat have a higher risk of heart disease. And that’s how the media reported it. But the study also found that people who eat red meat consume more calories, exercise less and are more likely to smoke.

2. We are all going to die. We often read of some new drug that saves lives, when the most any drug can do is postpone death. The important question is “By how much?” Kendrick describes a press release that claimed treating 10 million people with statins would save about 50,000 lives a year. He points out that a more informative way of putting it is that if 200 people were treated for a year, it would make no difference to 199 of them and the other one would live for a few extra months. (For more on statins, see Statins for the Healthy are Harmful, SiS 66, and The ‘Deadly Dangers of Saturated Fat’ & the ‘Superlative Safety of Statins’, SiS 67).

3. Relative mountains are made out of absolute molehills. According to a news report on the BBC, regularly drinking two large glasses of wine or two pints of strong beer a day triples the risk of mouth cancer. That sounds alarming, but only 2.5 out of every 100,000 people in the UK die of mouth cancer. So even if this is cause and effect and not just merely association (people who drink are more likely to smoke, less likely to exercise, and so on), the number of people affected is very small. Three times a tiny number is another tiny number.

4. Things that are false are often held to be true. For a long time it was believed that women are protected against heart disease by their sex hormones. Kendrick was unable to find any research to support the idea. The origin appears to be no more than the observation that (a) men were more susceptible than women to heart disease and (b) the sex hormones are the most obvious difference between the sexes. As a result, many menopausal women were prescribed hormone replacement therapy to maintain this protection. In the US, failure to prescribe could constitute malpractice. Eventually a large controlled study was carried out to measure the effect. It
turned out that the sex hormones were not providing protection. On the contrary, women who were taking HRT were at a greater risk of heart failure and strokes.

5. Reducing numbers does not equal reducing risk. High blood pressure is associated with a greater risk of heart disease. But that doesn't mean it is the cause; in fact, there is no evidence that reducing the blood pressure reduces the risk. Yet a drug that can lower the blood pressure below a certain number is considered an effective treatment, with no further check on whether it actually does the patient any good.

6. Challenges to the status quo are crushed. When Marshall and Warren argued that ulcers were caused not by stress but by a bacterial infection, they were met with ridicule and hostility – until they were awarded a Nobel Prize. Kendrick suggests three points to bear in mind. First, most experts are only experts in a relatively narrow field. Second, the angrier they are, the more likely it is that they suspect they are wrong. Third, because their reputation, status and income may all be at stake, it is very difficult for experts to change their minds.

7. Games are played. He who pays the piper calls the tune, and the pharmaceutical industry carries out or funds an ever-increasing proportion of the research and pays, in one way or another, most of the so-called key opinion leaders.

8. Doctors can seriously damage your health. For a number of reasons, doctors tend to be inclined towards more intervention rather than less.

9. Never believe that something is impossible. Many people died because the experts claimed cholera could not possibly be communicated by water or puerperal fever by doctors’ unwashed hands. Today we are assured that vaccination cannot possibly be a cause of autism (see MMR Controversy Reignites, SiS 66, for an update).

10. ‘Facts’ can be, and often are, plucked out of the air. It may sound very scientific to be told we should aim for a body mass index (BMI) between 18.5 and 25 but these are arbitrary figures. What is more, the evidence is that those who are considered overweight (BMI between 25 and 30) live longer than those who are ‘normal’, and even those classed as obese (BMI between 30 and 35) do as well. (If you find it hard to believe that you should take so much of what you are being told with a very large grain of salt, you should read a classic paper published ten years ago with the title “Why most published research findings are false”.)

To conclude
After you have read this book, you will be better placed to judge what you’re told. But it’s still not going to be easy. Kendrick has been working on the problem for a long time and besides, as a doctor he had a lot of background knowledge to begin with. He also knows his way around the medical journals, whereas most people don’t even have access to them except at extortionate cost.

As lay people we may not be able to evaluate scientific or statistical papers ourselves, but where experts disagree we have the right to hear both sides and judge between them. This is, after all, what juries are expected to do in a trial when there is disagreement between expert witnesses. For that to happen, the relevant papers must be publicly available, not hidden behind pay walls nor concealed on the grounds of “commercial confidentiality”. And the details of the research, if not included in the published papers, must be in accessible repositories. This might come about if the Transparency and Openness Promotion Guidelines, recently published in Science, were to be adopted, but if this progresses as slowly as the registration of Phase 1 clinical trials, it will be a long time before we see any effect.