

Open letter to the CMO (England), the Wellcome Trust and Public Health England

Why are your departments promoting corporations at the expense of public health and the environment? Is it to please the British Government or the Corporations?

The first part of this document is background information, the Open Letter starts on page 12

Background information

A NEW PAPER REVEALS MONSANTO'S SECRET STUDIES: MONSANTO KNEW THAT GLYPHOSATE CAUSED CANCER IN ANIMALS BUT MANIPULATED THE DATA¹

Monsanto has known since the 1970s that glyphosate causes cancer, according to a new paper by researchers Anthony Samsel and Stephanie Seneff. Samsel is the first independent researcher to examine Monsanto's secret toxicology studies on glyphosate. He obtained the studies through a request to his senator. With Dr Stephanie Seneff of MIT, he reviewed Monsanto's data. Samsel and Seneff concluded that: *"significant evidence of tumours was found during these investigations"*.

Extract: *Glyphosate has a large number of tumorigenic effects on biological systems, including direct damage to DNA in sensitive cells, disruption of glycine homeostasis, succinate dehydrogenase inhibition, chelation of manganese, modification to more carcinogenic molecules such as N-nitrosoglyphosate and glyoxylate, disruption of fructose metabolism, etc. Epidemiological evidence supports strong temporal correlations between glyphosate usage on crops and a multitude of cancers that are reaching epidemic proportions, including breast cancer, pancreatic cancer, kidney cancer, thyroid cancer, liver cancer, bladder cancer and myeloid leukaemia.*

Members of US EPA's Toxicology Branch of the Hazard Evaluation Division Committee, in a consensus review on March 4 1985, had classified glyphosate as a Group C carcinogen, based on the incidence in rats/mice of renal tumours, thyroid C-cell adenomas and carcinomas, pancreatic islet cell adenomas, hepatocellular adenomas and carcinomas in males, but on June 26 1991 the Health Effects Division Carcinogenicity Peer Review Committee met to discuss and evaluate the weight of evidence on glyphosate with particular emphasis to its carcinogenic potential. In a review of the data the Committee concluded that glyphosate should be classified as Group E (evidence of non-carcinogenicity for humans). However, three of the Committee refused to sign and wrote: DO NOT CONCUR. In 2012 Séralini and his colleagues performed a 2-year rat feeding study on GMO Maize and Roundup® and found liver and kidney damage and similar tumours, but the Science Media Centre accused Séralini's team of fraud and said the paper should be withdrawn.

THE WELLCOME TRUST HOSTS THE SCIENCE MEDIA CENTRE ---SPONSORED BY CORPORATIONS WHOSE 'EXPERTS' DENIED THAT ROUNDUP® AND GMOS CAUSED TUMOURS

The SMC sponsors include AstraZeneca, BP, Coca-Cola, L'Oreal, Monsanto, Syngenta and Nature Publishing Group. The Centre provides a rapid 'expert' opinion for journalists. But the Director admits that it was set up in the wake of Dr Árpád Pusztai publishing his paper which showed that rats fed on GM potatoes had stunted growth and a repressed immune system. The 'experts' are proponents of GMOs often having major conflicts of interest. The SMC allows corporations to influence what journalists write and hence control the information given to the British public.

THE COMMERCIAL INTERESTS OF PRODUCT DEVELOPERS WHO CONDUCT THEIR OWN SAFETY ASSESSMENTS AND RETRACT PAPERS THAT REPORT INCONVENIENT RESULTS

The Séralini affair: degeneration of Science to Re-Science?²

This recent paper from Fagan, Traavik and Bøhn, highlights the whole shameful affair of conflicts of interest and how science has been misused. *"The conflicts of interest inherent in allowing product developers to conduct the safety assessment research that serves as the basis for regulatory approval*

¹ https://www.academia.edu/17751562/Glyphosate_pathways_to_modern_diseases_IV_cancer_and_related_pathologies

² <http://www.enveurope.com/content/27/1/19>

of their own products also need to be reconsidered. The events surrounding the imposed retraction of Séralini et al. point to the need to recognize the tension inherent between **commercial interests of product developers and the scientific process, and to put in place at least basic safeguards to protect the latter**. If this is not done, there is growing risk that the standard of the future will not be Science, but Re-Science, which focuses, not on new research results that build humanity's knowledge base, but on disputes among interest groups for (i) retraction of papers that report inconvenient results, and (ii) republishing—the new Re-Science: Re-publish or Perish.”

Academic fraud and corruption: University scientists caught conspiring with Monsanto to manipulate public opinion on GMOs³ Dave Murphy EcoWatch, September 12, 2015

Last weekend (September 2015), *The New York Times* released a stunning expose of how Monsanto and the biotech industry enlisted allegedly independent public university scientists in a deceptive campaign to lobby state legislators in Pennsylvania, interfere with ballot initiatives in Oregon and Colorado and paper over risks of high pesticide usage on the Hawaiian island of Kauai...

For background on how this current story originally broke, you have to go back to Aug. 6, when the international science journal *Nature* reported that more than 4,600 pages of emails from University of Florida plant scientist Kevin Folta “*reveal his close ties to the agriculture giant Monsanto ... and other biotechnology-industry interests*” ...

MONSANTO IS BEING SUED IN THE US FOR FALSE CLAIMS

A Class Action Lawsuit is taken out by Los Angeles County against Monsanto for false advertising.⁴ Monsanto has deceived everyone, including the German Rapporteur Member State, the European Food Safety Authority and the UK Chemicals Regulation Directorate.

The Class Action Lawsuit taken out by Los Angeles County against Monsanto is for false advertising. Monsanto, on its label, claims that Roundup® doesn't affect humans and pets because they don't have the shikimate (EPSP) pathway which plants have.⁵

It is a false statement. Glyphosate not only affect plants, but humans/animals as well. The pesticides industry and its regulators are ignorant of human physiology. Humans (and animals) absorb nutrients through trillions of microbes in their gut, the human microbiome.⁶ These microbes **do** possess the enzyme pathway that is targeted by Roundup®. It is further stated in the lawsuit that there are many human and animal health problems associated with the disruption of our intestinal microbes. “Because it kills-off our gut bacteria, glyphosate is linked to stomach and bowel problems, indigestion, ulcers, colitis, gluten intolerance, sleeplessness, lethargy, depression, Crohn's Disease, Celiac Disease, allergies, obesity, diabetes, infertility, liver disease, renal failure, autism, Alzheimer's, endocrine disruption, and the W.H.O. recently announced glyphosate is 'probably carcinogenic'.”

The lawsuit was due to be heard on July 10th 2015, but the judge has delayed it. A similar lawsuit has been announced by lawyers in New York.⁷ There are other lawsuits building up against Monsanto.

MONSANTO PATENTED GLYPHOSATE AS AN ANTIBIOTIC IN 2010: INDEPENDENT SCIENTISTS HAVE SHOWN THAT SUB-LETHAL EXPOSURE TO HERBICIDES GLYPHOSATE, DICAMBA AND 2,4-D CAUSE CHANGES IN ANTIBIOTIC SUSCEPTIBILITY IN E.COLI AND SALMONELLA spp.

Professor Dame Sally Davies is said to be an expert on antibiotic-resistant diseases. So is Dr Jeremy Farrar, Director of the Wellcome Trust. They both lecture around the world about antibiotic-resistant diseases being an apocalyptic global threat and blame vets, GPs and farmers.

I wrote to both of them (individually) to tell them that glyphosate had been patented as an antibiotic. Dr Farrar failed to reply. Dame Sally Davies replied: “Given the detailed regulatory regime for plant protection products, this is the most appropriate place for these issues to be considered.”

³ <http://ecowatch.com/2015/09/12/scientists-conspire-monsanto-gmos/>

⁴ <http://www.monsantoclassaction.org/>

⁵ <http://www.examiner.com/article/monsanto-sued-los-angeles-county-for-false-advertising>

⁶ <http://www.nature.com/nature/journal/v500/n7464/abs/nature12506.html>

⁷ <http://www.aboutlawsuits.com/roundup-class-action-lawsuit-85070/>

I also wrote to Dr Gillian Leng of the National Institute of Health Care Excellence ⁸ after NICE had published Guidance on Overuse of Antibiotics. This scientific paper confirms that exposure to herbicides cause changes in antibiotic susceptibility.⁹

IMPORTANCE *"Increasingly common chemicals used in agriculture, domestic gardens, and public places can induce a multiple antibiotic resistance phenotype in potential pathogens. The effect occurs upon simultaneous exposure to antibiotics and is faster than the lethal effect of antibiotics. The magnitude of the induced response may undermine antibiotic therapy and substantially increase the probability of spontaneous mutation to higher levels of resistance. The combination of high use of both herbicides and antibiotics in proximity to farm animals and important insects, such as honeybees, might also compromise their therapeutic effects and drive greater use of antibiotics. To address the crisis of antibiotic resistance requires broadening our view of environmental contributors to the evolution of resistance."*

EFSA HAS RECOMMENDED RENEWAL OF GLYPHOSATE REGISTRATION: THEY REJECTED WHO/IARC REPORT ON CARCINOGENICITY TO HUMANS

The conclusions of the European Food Safety Authority (EFSA), following the peer review of the initial risk assessments carried out by the competent authority of the rapporteur Member State Germany, for the pesticide active substance glyphosate are reported. ¹⁰ However, EFSA admitted that the genotoxic effects observed in some glyphosate-based formulations are related to the other constituents or "co-formulants". However, it is mostly commercial products that are sold. Member States are responsible for evaluating each plant protection product that is marketed in their territories. EFSA and the RMS claim that it does not affect human health (see **Chapter 3** Deterioration of health in the UK, the US and Latin America) and that it has negligible effects on the environment (see **Chapter 4** Loss of biodiversity correlated to chemicals in the environment). In particular they totally reject WHO/IARC's classification of glyphosate as carcinogenic to humans (see above: Monsanto's sealed documents).

THE EUROPEAN COMMISSION (EC) HAS ALLOWED EFSA AN EXTENSION UNTIL JUNE 30TH 2016

Glyphosate was meant to be assessed in 2012, but the European Commission delayed it when they heard it caused birth defects.¹¹ On 12 October 2015 I sent an Open Letter to the European Commission and the European Food Safety Authority.¹² It was acknowledged. The first item concerned Samsel's statement that Monsanto's own studies showed that glyphosate was carcinogenic.

On 05/11/2015 I received a reply from Michael Flüh on behalf of the EC which 'clarified' their position. He said that the date had been extended to allow EFSA to examine the International Agency on Cancer Research's full Report in the carcinogenicity of glyphosate to humans to be studied and allow the renewal process to be completed. *"It is only after the publication of the EFSA Conclusions that the Commission will present a Review Report and a draft Regulation as regards the possible renewal of the substance to the Standing Committee for Plants, Animals, Food and Feed."* See **Chapter 2** History of chemical regulation in Europe – in the hands of the pesticides industry.

WHAT ARE ENDOCRINE DISRUPTING CHEMICALS?

⁸ https://www.academia.edu/15531747/Open_letter_to_NICE_glyphosate_is_an_antibiotic_as_are_other_herbicides

⁹ <http://mbio.asm.org/content/6/2/e00009-15.full.pdf+html> Sublethal Exposure to Commercial Formulations of the Herbicides Dicamba, 2,4-Dichloro- phenoxyacetic Acid, and Glyphosate Cause Changes in Antibiotic Susceptibility in *Escherichia coli* and *Salmonella enterica* serovar Typhimurium.

¹⁰ <http://www.efsa.europa.eu/de/efsajournal/pub/4302>

¹¹ <http://earthopensource.org/earth-open-source-reports/roundup-and-birth-defects-is-the-public-being-kept-in-the-dark/>

¹²

https://www.academia.edu/16785352/Open_Letter_to_the_European_Commission_and_European_Food_Safety_Authority

An assessment of the State of Science of Endocrine Disruptors (EDCs) was prepared for the United Nations Environment Program and the World Health Organization by a group of approximately 50 expert scientists in 2012.¹³

The authors outlined the current evidence of: 1) a high incidence, and increasing trends, of many endocrine-related disorders in humans; 2) observations of endocrine-related effects in wildlife populations; 3) identification of chemicals with endocrine disrupting properties linked to disease outcomes in laboratory studies.

“Endocrine-related disorders in humans are manifest by:

- *Increases in low semen quality in young men (up to 40%)*
- *Incidence of genital malformations has increased over time*
- *Adverse pregnancy outcomes and birth defects has increased in many countries*
- *Neurobehavioural disorders related to thyroid dysfunction has increased*
- *Endocrine-related cancers (breast, endometrial, ovary, prostate, testicular and thyroid cancers) have been increasing over the past 40 -50 years*
- *Earlier onset of breast development in young girls which leads to breast cancer*
- *The prevalence of obesity and type 2 diabetes is increasing. The WHO estimates that 1.5 billion adults worldwide are overweight or obese and that the number with type 2 diabetes increased from 153 million to 347 million between 1980 and 2008”*

The conclusion was: *“It is essential to evaluate associations between EDC exposures and health outcomes by further developing methods for which proof of concept is currently under development.”*

DISPUTE BETWEEN ENDOCRINOLOGISTS AND TOXICOLOGISTS ABOUT THE DOSE REQUIRED TO DISRUPT HORMONES AND WHAT PRECISELY CONSTITUTES A HORMONE¹⁴

“In 2002, the relevance of EDCs to people and their biological mechanisms were poorly understood” says Andrea Gore (Professor of Pharmacology and Toxicology, University of Texas at Austin in the USA). But a flood of papers since then by *“academic researchers and epidemiologists with no conflicts of interests”*, Gore emphasises, has led to a radical reappraisal of the hazards posed by EDCs. Standard toxicology assumes that as the dose of a chemical increases, so does its effect, and vice versa. This is a monotonic dose response. Safe exposure standards are usually set by exposing an experimental animal to a high dose of a chemical, and then successively decreasing doses until the effects of the chemical are no longer detectable. But this logic falls apart if the compound under investigation happens to cause a non-monotonic dose response—i.e., there is no linear relation between dose and response, and a significant response can be caused at a low dose despite there being no or little response at a high dose. *“Hormones act at extremely low doses; furthermore, actions of hormones (or EDCs) at one dose may not predict outcomes at another dose”*, Gore points out. Linda Birnbaum, the straight-talking Director of the US National Institute of Environmental Health Sciences (NIEHS), one of the National Institutes of Health, sums up the mood of frustration. *“There are some people still stuck in the last century”*, she says. And although she stresses that the EPA can *“only do so much”*, she continues that *“the EPA's focus on endocrine disruption is very much on oestrogen, androgen, and thyroid. Well guess what, there are lots of other endocrine systems. Ten years ago we were thinking things were pretty simple, it turns out to be a lot more complicated”*, and many regulators, in Birnbaum's opinion, are not capturing that complexity. *“Context is everything”*, she says. *“You can have a completely different response to the same hormone, possibly going through the same receptor system, in one tissue than you'd have in another tissue. And that response can be very time dependent; not only chronic versus acute but developmentally.”*

¹³ http://unep.org/pdf/9789241505031_eng.pdf

¹⁴ [http://www.thelancet.com/journals/landia/article/PIIS2213-8587\(13\)70057-3/fulltext](http://www.thelancet.com/journals/landia/article/PIIS2213-8587(13)70057-3/fulltext)

For example one study¹⁵ found that breast cancer cell proliferation is accelerated by glyphosate in extremely low concentrations. *“The present study used pure glyphosate substance at log intervals from 10⁻¹² to 10⁻⁶ M. These concentrations are in a crucial range which correlated to the potential biological levels at parts per trillion (ppt) to parts per billion (ppb) which have been reported in epidemiological studies.”*

WHY ARE EUROPE AND THE UK PROTECTING THE PESTICIDES INDUSTRY?

THE CMO AND PHE ENGLAND TRIES TO EXPLAIN AWAY ALL THE DISEASES AFFECTING THE UK

Increasing obesity, autism, Alzheimer's, Diabetes, liver failure, kidney failure, heart disease, mental disorders, depression, suicide, hypercholesterolaemia and cancers have been acknowledged. They have been blamed on public lifestyle, failures of GPs, isolation or global warming. The rest has been ignored. Congenital anomalies, Parkinson's, Motor Neurone Disease, Brain Tumours, Lymphomas, infertility, cataracts, inflammatory bowel disease are amongst those increasing. Britain must be the only country where the CMO hasn't told the public that glyphosate has been declared a probable carcinogen to humans according to WHO International Agency for Research into Cancer (IARC).

THE NHS IS FAILING AND WILL CONTINUE TO FAIL BECAUSE OF ALL THESE DISEASES CAUSED BY GLYPHOSATE AND OTHER CHEMICALS WHICH UK MEDICAL EXPERTS DO NOT ACKNOWLEDGE

Until and unless glyphosate is banned in the UK and the agrochemical industries' power and influence over Britain, Defra and the NFU stops, the incidence of diseases will continue to increase.

PUBLIC HEALTH ENGLAND (PHE) WAS CREATED IN 2013 BY THE GOVERNMENT: WAS IT SET UP TO CONVEY ITS MESSAGES AND THOSE OF CORPORATIONS RATHER THAN TO PROTECT THE PUBLIC?

PHE published controversial Reports as diverse as the impacts of fracking on public health (low), review of e-cigarettes (safe), alcohol, sugar, diabetes and obesity, all of which were advantageous to industry and the British government. Professor Paul Cosford, Director for Health Protection and Medical Director Public Health England, (who had defended the Report on Fracking in his evidence to the House of Commons Health Select Committee in June 2014) had the opportunity to influence the European Commission's decision on glyphosate in Europe, but he failed to reply to me, as a member of the public. Professor Kevin Fenton, MD, PhD, FFPH, Public Health England's National Director for Health and Wellbeing **did** reply, but when he saw Dr Nancy Swanson's graphs of correlations of glyphosate applied and GM Crops (US Department of Agriculture, USDA) with disease incidence (Centers for Disease Control and Prevention CDC) he replied “correlation doesn't mean causation.” Before his post with PHE he worked for CDC in the US. After having sent him further independent science about glyphosate, our correspondence ceased (from his side).

THE AGROCHEMICAL INDUSTRY HAS WORKED WITHIN GOVERNMENT SINCE BEFORE WW2

Rothamsted Research was established in 1843 by a philanthropist collaborating with a chemist and had discovered the first chemical herbicide 2,4-D in 1941. A review of *Pesticides and Birds* published in 1965 by the Head of the Nature Conservancy Council's Pesticide Monitoring Unit at Monks Wood Experimental Station stated that 200 chemicals were being used by farmers, and these were having a devastating effect on birds. The post-war crash in raptor populations was finally linked to the new organochlorine pesticides DDT and dieldrin. [The neonicotinoid insecticide clothianidin is 10,800 more toxic to bees, dose for dose, than DDT was in 1945¹⁶] The late Derek Radcliffe, Chief Scientist of the NNC, said in his autobiography: ¹⁷ *“Despite much prevarication and obscurantism from the agricultural establishment and agrochemical interests”* the UK Advisory Committee on pesticides was persuaded to bring in successive restrictions on their use, first in 1962, and then extended to

¹⁵ <http://www.ncbi.nlm.nih.gov/pubmed/23756170>

¹⁶ My thanks to Dr Jean-Marc Bonmatin Centre, National de la Recherche Scientifique, Orleans, France for allowing me to quote from his slide on the relative toxicities to bees of the neonicotinoid insecticides to DDT.

¹⁷ Ratcliffe, D.A. *In Search of Nature*. Peregrine Books 2000.

1964. Only finally, 20 years later, in 1982, EU regulations required a formal ban on all the organo-chlorine pesticides except lindane. The main Wildlife Research Sites were closed down in 2006. Lord Sainsbury of Turville, at that time the Parliamentary Under-secretary of State with responsibility for Science and Innovation, defended the closures: *"In today's multidisciplinary world, basic research increasingly should be done in a multi-disciplinary environment like universities"*. The Royal Commission on Environmental Pollution (RCEP) criticized the Government for its lax pesticides policy and particularly for aerial spraying. In 2011 the RCEP was abolished. See **Chapter 1** History of farming with chemicals in the UK.

HOW THE UK GOVERNMENT HAS COLLUDED WITH THE AGROCHEMICAL CORPORATIONS AGAINST THE PUBLIC AND BIODIVERSITY

Freedom of Information requests showed that GM companies are running the Government's PR strategy on GM crops by controlling how public and private money will be invested in research.¹⁸

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS (RCOG) ADVICE ABOUT EXPOSURE TO CHEMICALS DURING PREGNANCY¹⁹ WAS DISMISSED BY THE CMO FOR ENGLAND

The RCOG Report's advice about exposure to chemicals during pregnancy was dismissed by Professor Dame Sally Davies who said it was 'unhelpful'.²⁰ She claimed it was all about cosmetics, but the main thrust of the paper was about environmental exposure to pesticides, chemicals in food and endocrine-disrupting chemicals (EDCs).

The CMO asked Dr John Harrison, Director of the Public Health England (PHE), Centre for Radiation, Chemical and Environmental Hazards (CRCE) to write to me and reassure me that there was no evidence that exposure to chemicals in pregnancy caused brain damage.

The Defra Minister, the Defra Chief Scientist and the Chief Scientist CRD gave evidence at the Environmental Audit Committee Inquiry Insects and Insecticides. When questioned by Dr Matthew Offord MP (Q359) about removing amateur applications of pesticides, they all agreed that it wasn't necessary to ban domestic use.²¹ Bayer had just re-launched its 'family friendly' garden products campaign.²² Presumably they had taken the advice from Dow Chemicals. In a 158-page Review by a Dow (which makes chlorpyrifos, a chemical still on the market in the UK but being reconsidered in the US) scientist and funded by the Crop Protection Association: Review of Pesticide Exposure and Neurodevelopmental Outcomes disagreed with the above studies: *"In conclusion, epidemiologic evidence for causality between exposure to specific pesticides during critical periods of brain development and neurobehavioral outcomes is not compelling."*²³

This contradicts the opinion of independent scientists/doctors from around the world: The Faroes Statement: Human Health Effects of Developmental Exposure to Chemicals in Our Environment

In 2007 twenty-five experts in environmental health from eleven countries (including from the UK) met on the Faroes and contributed to this statement.²⁴ *"The periods of embryonic, foetal and infant development are remarkably susceptible to environmental hazards. Toxic exposures to chemical pollutants during these windows of increased susceptibility can cause disease and disability in infants, children and across the entire span of human life. Among the effects of toxic exposures recognized in the past have been spontaneous abortion, congenital malformations, lowered birthweight and other adverse effects. These outcomes may be readily apparent. However, even subtle changes caused by chemical exposures during early development may lead to important functional deficits and increased risks of disease later in life. The timing of exposure during early life has therefore become a crucial factor to be considered in toxicological assessments."*

¹⁸ http://www.genewatch.org/uploads/f03c6d66a9b354535738483c1c3d49e4/FoI_summary_May14.pdf

¹⁹ https://www.rcog.org.uk/globalassets/documents/guidelines/scientific-impact-papers/sip_37.pdf

²⁰ <http://www.theguardian.com/lifeandstyle/2013/jun/07/pregnancy-advice-royal-college-health-chief>

²¹ <http://www.publications.parliament.uk/pa/cm201213/cmselect/cmenvaud/668/668.pdf>

²² <http://www.gardenforum.co.uk/tradeforum/peoplenews/?artid=2382>

²³ <http://dx.doi.org/10.1080/10937404.2013.783383>

²⁴ <http://www.ncbi.nlm.nih.gov/pubmed/18226057>

Advice from the American Academy of Pediatrics: Council on Environmental Health²⁵

Policy Statement: Pesticide Exposure in Children

Pesticides are a collective term for chemicals intended to kill unwanted insects, plants, molds, and rodents. Children encounter pesticides daily and have unique susceptibilities to their potential toxicity. Acute poisoning risks are clear, and understanding of chronic health implications from both acute and chronic exposure are emerging. Epidemiologic evidence demonstrates associations between early life exposure to pesticides and pediatric cancers, decreased cognitive function, and behavioral problems. Related animal toxicology studies provide supportive biological plausibility for these findings. Recognizing and reducing problematic exposures will require attention to current inadequacies in medical training, public health tracking, and regulatory action on pesticides. Ongoing research describing toxicologic vulnerabilities and exposure factors across the life span are needed to inform regulatory needs and appropriate interventions. Policies that promote integrated pest management, comprehensive pesticide labeling, and marketing practices that incorporate child health considerations will enhance safe use.

THE EFFECTS OF CHEMICALS ON THE DEVELOPMENT OF THE BRAIN²⁶

ONLY ONE CHANCE: How Environmental Pollution Impairs Brain Development - and How to Protect the Brains of the Next Generation by Professor Philippe Grandjean: Oxford University Press.

Chemical brain drain: insidious and pervasive

"Today, one out of every six children suffers from some form of neurodevelopmental abnormality. The causes are mostly unknown. Some environmental chemicals are known to cause brain damage and many are suspected of it, but few have been tested for such effects.

The brain's development is uniquely sensitive to toxic chemicals and even small deficits may negatively impact our academic achievements, economic success, risk of delinquency, and quality of life. Chemicals such as mercury, polychlorinated biphenyls (PCBs) arsenic and certain pesticides pose an insidious threat to the next generation's brains. When chemicals in the environment affect development of the child's brain, he or she is at risk for mental retardation, cerebral palsy, autism, ADHD, and a range of learning disabilities and other deficits that will remain for a lifetime.

The chemical brain drain can be halted to protect the next generation's brainpower. First, we need to control all of the 200 industrial chemicals that have already been proven to affect brain functions in adults, as their effects on the developing brain are likely even worse. We must also demand routine testing for brain toxicity, stricter regulation of emissions of brain-toxic chemicals, and required disclosure on the part of industries that unleash these hazardous chemicals into products and the environment. Decisions can still be made to protect the brains of future generations – and some decisions appear to be seriously overdue. This site aims at furthering information on chemical risks to brain development and ways to protect the next generation against chemical brain drain."

Review of Philippe Grandjean's book by the late THEO COLBORN, PHD, President, TEDX (the Endocrine Disruptor Exchange)

"This book is a huge gift to humankind from an eminent scientist. Grandjean tells the truth about how we have been ruining the brainpower of each new generation and asks if there are still enough intelligent people in the world today to reverse the problem. I cannot rid myself of the idea that too many brains have been drained and society is beyond the point of no return. We must learn from the follies and scandals that Grandjean reveals and stop the chemical brain drain before it is too late."

CHILDREN LIVING IN BRITAIN ARE THE MOST EXPOSED TO AGRICULTURAL CHEMICALS COMPARED WITH OTHER EUROPEAN COUNTRIES (HENCE 'CHEMICAL BRAIN DRAIN')

British Governments had been advised that farming should be chemically based since WW2. All seem to have failed to appreciate that chemicals are hazardous. Children in the UK are falling behind

²⁵ <http://pediatrics.aappublications.org/content/130/6/e1757>

²⁶ www.chemicalbraindrain.info

global rivals in international tests taken by 15-year-olds (PISA),²⁷ failing to make the top 20 in mathematics, reading and science (December 2013). In 2000 UK children were 4th in the PISA tests.

NATIONAL FARMERS' UNION REPLIED TO MY 13-PAGE OPEN LETTER ON 17/11/2015²⁸

The President of the NFU wrote to defend the right of farmers to use chemicals to protect their crops **even though I had informed him that they were damaging the brains of children in Britain.** *"The NFU firmly believes that technologies such as advanced plant breeding, biotechnology, and chemical crop protection are a positive and essential part of British farming and food production".*

SOIL ASSOCIATION'S CAMPAIGN NOT IN OUR BREAD²⁹: THE UK'S POSITION IS ANOMALOUS

Meeting on 15 July 2015 in London between the Soil Association and a Scientific Panel³⁰

The scientific panel included Professor Christopher Portier, one of the co-authors of the World Health Organisation's International Agency for Research on Cancer's (IARC) recent report which determined Glyphosate's status as a probable carcinogen, who reiterated the IARC's conclusions, and said: ***"Glyphosate is definitely genotoxic. There is no doubt in my mind."***

Dr Robin Mesnage of the Department of Medical and Molecular Genetics at Kings College in London, revealed new data analysis showing Round Up®, the most common brand of Glyphosate-based herbicides, is 1,000 times more toxic than Glyphosate alone due to the inclusion of other toxic chemicals in its mix. Claire Robinson, an editor at GMWatch.org gave the international perspective looking at moves by other countries to ban Glyphosate; *"Outside the United Kingdom, the reaction to the WHO IARC report has been dramatic. Some retailers in Switzerland and Germany have removed Glyphosate products and France has committed to do so by 2018 and German states are calling for an EU wide ban. The Danish Working Environment Authority has declared it as a carcinogen and El Salvador and Sri Lanka have banned it and the Colombia government has banned aerial spraying on coca crops."*

Peter Melchett, Soil Association policy director said; *"If Glyphosate ends up in bread it's impossible for people to avoid it, unless they are eating organic. On the other hand, farmers could easily choose not to use Glyphosate as a spray on wheat crops – just before they are harvested. This is why the Soil Association is calling for the immediate ending of the use of Glyphosate sprays on wheat destined for use in bread."*

WHY DID DAVID CAMERON AND DEFRA HIDE THE OPEN LETTER FROM AMERICA WARNING THE UK AGAINST AUTHORIZING GENETICALLY MODIFIED CROPS³¹

The Open Letter from America was from 60 million American citizens to David Cameron (and the EU) warning the UK not to authorize GM crops because of the devastating effects on human health and the environment.

"Through our experience we have come to understand that the genetic engineering of food has never really been about public good, or feeding the hungry, or supporting our farmers. Nor is it about consumer choice. Instead it is about private, corporate control of the food system. Americans are reaping the detrimental impacts of this risky and unproven agricultural technology. EU countries should take note: there are no benefits from GM crops great enough to offset these impacts. Officials who continue to ignore this fact are guilty of a gross dereliction of duty."

Most of the countries in the EU have opted out of GM. Had the Prime Minister and Defra told British farmers about the letter? Or are British farmers and the public being kept in complete ignorance

²⁷ [http://www.cmec.ca/252/Programs-and-Initiatives/Assessment/Programme-for-International-Student-Assessment-\(PISA\)/PISA-2012/index.html](http://www.cmec.ca/252/Programs-and-Initiatives/Assessment/Programme-for-International-Student-Assessment-(PISA)/PISA-2012/index.html)

²⁸ https://www.academia.edu/17144792/Open_Letter_to_the_National_Farmers_Union

²⁹ <http://www.soilassociation.org/notinourbread>

³⁰ <http://www.soilassociation.org/news/newsstory/articleid/8110/soil-association-calls-for-ban-on-glyphosate-the-world-s-most-widely-sold-weedkiller>

³¹ www.theletterfromamerica.org

about the dire effects on humans and the environment. Are we all guinea-pigs being sacrificed for the sake of the economy?

NATURAL ENVIRONMENT RESEARCH COUNCIL (NERC): WHAT MADE NERC CHANGE FROM PROTECTING THE ENVIRONMENT TO PROTECTING CORPORATIONS?

In 1977, *A Nature Conservation Review* was jointly published by the former Nature Conservancy Council (NCC) and the Natural Environmental Research Council (NERC), under the Editorship of the late Derek Ratcliffe, Chief Scientist of the NCC.³² It was an extraordinary *tour de force*. A cornerstone document of nature conservation, this two volume work was an account of our nation's heritage of wildlife and its habitats. It documented 735 key sites in Britain which had been selected to represent all the main types of natural and semi-natural vegetation with their characteristic communities of plants and animals. These were described as *"the most important sites that should be conserved to exemplify this rich heritage"*. Many of these sites are unprotected or have disappeared because the agrochemical industry and the British Government have been put in charge of the environment.³³ Why did NERC suggest closure of the wildlife research sites in 2005 to 'balance the budget'?

Could it be because the British government and the agrochemical industry had promised to fund a global satellite system (Globolakes)³⁴ with which they could monitor biodiversity from space, in exchange for monitoring it on the ground? It was opened in 2012.

THE US ENVIRONMENTAL PROTECTION AGENCY

The US EPA has hidden Monsanto's sealed documents for nearly 40 years. Some scientists knew that Monsanto's early studies had shown that glyphosate caused cancer, but some (not all) scientists colluded with Monsanto to change the classification. In 1985 the US EPA classified glyphosate as a Group C carcinogen but changed to Group E in 1991.³⁵ The original Panel comprised of members of the Toxicology Branch of the Hazard Evaluation Division which examined the carcinogenic potential of glyphosate. In a consensus review on March 4 1985 the Committee classified glyphosate as a Group C carcinogen. It was based on the incidence in rats/mice of **renal tumours, thyroid C-cell adenomas and carcinomas, pancreatic islet cell adenomas, hepatocellular adenomas and carcinomas** in males. However, in 1991 The Health Effects Division Carcinogenicity Peer Review Committee met on June 26 1991 to discuss and evaluate the weight of evidence on glyphosate with particular emphasis to its carcinogenic potential. In a review of the data the Committee concluded that glyphosate should be classified as Group E (evidence of non-carcinogenicity for humans). In order to cover themselves they declared: "It should be emphasized, however, that the designation of an agent in Group E is based on the available evidence at the time of evaluation and should not be interpreted as a definitive conclusion that the agent will not be a carcinogen under any circumstances." There were signatures of the 11 members present, six members signed *in absentia* but three members refused to sign because they "did not concur." Presumably they knew that the change of classification of glyphosate from Group C to Group E was fraudulent.

Poison Spring: The Secret History of Pollution and the EPA (Environmental Protection Agency)

*"Poison Spring"*³⁶ documents, in devastating detail, the corruption and misuse of science and public trust that has turned the (US) EPA from a watchdog into a *"polluters' protection agency."* In its half-century of existence, the agency has repeatedly reinforced the chemical-industrial complex by endorsing deadly chemicals, often against the continued advice of its own scientists. It has botched

³² <http://www.cambridge.org/gb/academic/subjects/life-sciences/ecology-and-conservation/nature-conservation-review-selection-biological-sites-national-importance-nature-conservation-britain-volume-1>

<http://www.cambridge.org/gb/academic/subjects/life-sciences/ecology-and-conservation/nature-conservation-review-selection-biological-sites-national-importance-nature-conservation-britain-volume-2>

³³ <http://www.theguardian.com/environment/damian-carrington-blog/2012/mar/15/george-osborne-budget-bill-uk>

³⁴ <http://www.globolakes.ac.uk/>

³⁵ http://www.epa.gov/opp00001/chem_search/cleared_reviews/csr_PC-103601_30-Oct-91_265.pdf

³⁶ <http://www.independentsciencenews.org/health/poison-spring-the-secret-history-of-pollution-and-the-epa/>

field investigations, turned a blind eye to toxic disasters, and unblinkingly swallowed the self-serving claims of industry." One of the authors, E.G.Vallianatos, had worked for the US EPA for 25 years.

Failure to regulate data fraud comes home to roost Carol Van Strum 9 April 2015

Extracts: ³⁷ Within the first decade of the EPA's existence, it became obvious that nearly all the "safety" tests supporting pesticide registrations were faked, with either fraudulent or nonexistent data. The massive lab fraud uncovered at Industrial Bio-Test Laboratories (IBT) revealed that 99 percent of long-term studies (for cancer, birth defects, mutagenicity, reproductive damage *etc.*) supporting some 483 pesticide registrations were invalid. For 25 years, in what US Food and Drug Administration (FDA) officials called "*the most massive scientific fraud ever committed in the United States, and perhaps the world,*" all major chemical and pharmaceutical companies had paid IBT to produce the test data they needed to register their products. All but forgotten now, the IBT fraud shook the chemical and pharmaceutical industries and regulatory agencies around the world. In 1983, a six-month-long criminal trial resulted in the convictions of three IBT officials. The trial revealed a vast, lucrative business of deceptive safety testing:

- New animals routinely substituted - often *en masse* - for test animals that died, without noting deaths or substitutions in lab reports;
- Entire test data and lab reports for one test product copied into reports for other products;
- "Magic pencil" studies substituted false data for tests never done or results implicating test products' adverse or fatal effects;
- Signatures of lab techs who had refused to sign false reports were forged by managers on the false reports;
- Rats listed as dead and autopsied in one section of a report reappeared alive and breeding in another section of the same report ("Now IBT did some strange and unusual things," Dr. Adrian Gross, who first revealed the IBT scandal, remarked, "but bringing back the dead wasn't one of them.");
- Substitution of unexposed control animals for test animals that died;
- Substitution of dogs for rats when all the rats in one test died, then reporting them to be rats;
- Wholesale concealment and falsification of cancers, testicular atrophy, death and other effects in test animals;
- A laboratory that IBT scientists called "The Swamp," with a faulty water system that drenched the entire room, cages, rodents and all, in a continuous spray of water, drowning the test animals in droves. "Dead rats and mice, technicians later told federal investigators, decomposed so rapidly in the Swamp that their bodies oozed through wire cage bottoms and lay in purple puddles on the dropping trays."
- Massive, frequent die-offs of test animals due to staff failing to feed and water them over holidays, rodents dying from unhygienic conditions, rats dying from rat poison fed them by mistake, rodents escaping, rats and mice being shifted from one cage to another, contaminating and eating each other; frequent "search and destroy" hunts for escaped rodents, with scientists and lab techs dashing about squirting chloroform to "slow down" the escapees, often killing the test animals as well;
- After Gross' first visit to IBT in 1976 and before he could return with auditors, the company equipped its offices with paper shredders and "strip filed" huge volumes of raw data, studies and client lists, including all of its studies on 2,4-D, six other herbicides (never identified), artificial sweeteners, cyclamates and plastics components.

WHY HAVE THE MAINSTREAM MEDIA IN BRITAIN, THE US AND AUSTRALIA REMAINED SILENT?

³⁷ <http://www.truth-out.org/news/item/30097-failure-to-regulate-pesticide-data-fraud-comes-home-to-roost>

For over 14 years, Daniel Estulin³⁸ has investigated and researched the far-reaching influence of the **Bilderberg Group** on business and finance, global politics, war and peace, and control of the world's resources and its money. In a review of the book (May 25 2014), Stephen Lendman³⁹ wrote: "*CBS and other media giants control everything we see, hear and read – through television, radio, newspapers, magazines, books, films, and large portions of the Internet. Their top officials and some journalists attend Bilderberg meetings – on condition they report nothing.*" The list of participants for the last 15 years or so shows that the CEO of Syngenta attended regularly (as part of the UK delegation) and must be a core member.⁴⁰ He occupies a powerful position amongst the global élite and presumably shares Bilderberg's objectives of creating a New World Order with an all-powerful corporate-controlled, global government with no democracy, manufactured crises and perpetual wars. Syngenta is ruthless in its pursuit of individual scientists who challenge its products,⁴¹ but has lost court cases against it in the US for contaminating water supplies with atrazine⁴² and in Germany it was criminally charged for denying knowledge that its GM Bt 176 corn killed livestock.⁴³ The participants at Bilderberg 2015⁴⁴ included George Osborne Chancellor of the Exchequer, Ed Balls, former Chancellor of the Exchequer and representatives from the Economist, the Financial Times and the Chairman of the BBC Trust, Rona Fairhead. The BBC promotes the agrochemical industry at every opportunity, although industry bias is consistently denied.⁴⁵

THE SIXTH MASS EXTINCTION AND CHEMICALS IN THE ENVIRONMENT: OUR ENVIRONMENTAL DEFICIT IS NOW BEYOND NATURE'S ABILITY TO REGENERATE⁴⁶

This new paper published in the *Journal of Biological Physics and Chemistry* shows how the conservation of natural ecosystems is essential to human health; but that the accelerated losses of biodiversity are a result of human activity.

Summary: Two papers about the future of the planet appeared within a month of each other (June/July 2015): *Accelerated modern human-induced species losses: Entering the sixth mass extinction* was the first (5 pages long). The 6 authors calculated the average rate of vertebrate losses over the last century and compared it with the background rate of losses. They estimated it to be up to 114 times the background rate and asserted that this rate of losses of biodiversity indicated that a sixth mass extinction is already under way. The authors described themselves variously as ecologists, field biologists, paleobiologists or population biologists, but all held two beliefs in common: that the conservation of natural ecosystems is essential to human health; but that the accelerated losses of biodiversity are a result of human activity. *Safeguarding human health in the Anthropocene epoch: Report of the Rockefeller Foundation–Lancet Commission on planetary health* was the second paper (56 pages, with 23 authors). At least 10 of the authors were associated with the Rockefeller Foundation, although only one curriculum vitae acknowledged the fact. Sarah Whitmee was seconded to the Foundation to serve as lead author of the Report and member of the Foundation's secretariat. One author worked as an environmental health scientist in the Office of the Science Adviser at the United States Environmental Protection Agency and was lead author of a recent paper *Biodiversity loss affects global disease ecology*, which made no mention of pesticides. Most of the remainder are eminent public health doctors. The Rockefeller Foundation funded the initial research

³⁸ Daniel Estulin: The True Story of the Bilderberg Group 2009

³⁹ <http://www.globalresearch.ca/the-true-story-of-the-bilderberg-group-and-what-they-may-be-planning-now/13808>

⁴⁰ <http://www.biblebelievers.org.au/bball.pdf>

⁴¹ <http://www.newyorker.com/magazine/2014/02/10/a-valuable-reputation>

⁴² <http://www.atrazinesettlement.com/utility/GetFile/c3e918bf-742a-41fa-8af6-0637bcf0b253>

⁴³ http://www.i-sis.org.uk/Syngenta_Charged_for_Covering_Up_Livestock_Deaths_from_GM_Corn.php

⁴⁴ <http://www.bilderbergmeetings.org/participants2015.html>

⁴⁵

https://www.academia.edu/15195199/Effects_of_pesticides_on_humans_and_the_environment_Why_are_the_British_Government_and_the_BBC_protecting_industry

⁴⁶ https://www.academia.edu/17783363/The_sixth_mass_extinction_and_chemicals_in_the_environment

on genetically modified organisms in the early 1940s and founded the science of molecular biology, a highly reductionist programme aimed at “understanding” life. The Rockefeller Foundation supports biofortification of crops - the introduction of nutrients into crops by genetic engineering techniques for the supposed benefit of third world countries. The persistent and increasing global contamination of water and air by long-acting biocides, particularly formulated glyphosate and the neonicotinoid insecticides, are toxic not only to the poor, but to the rich as well. The Rockefeller Foundation’s early involvement in eugenics research and its subsequent support for depopulation are unlikely to be consummated before the sixth mass extinction.

Open letter to the CMO (England), the Wellcome Trust and Public Health England

	Introduction	12
Chap 1	History of farming with chemicals in the UK	18
Chap 2	History of chemical regulation in Europe – in the hands of the pesticides industry	37
Chap 3	Deterioration of health in the UK, the US and Latin America	56
Chap 4	Loss of biodiversity and chemicals in the environment	72

Introduction

Why is the Science Media Centre sponsored by corporations, but not by NGOs or Unions?

It is hosted by The Wellcome Trust. The Director, Dr Jeremy Farrar, must have been aware of this Colin Macilwain, a science policy writer from Edinburgh who has worked as a reporter and an editor from both sides of the Atlantic⁴⁷ wrote about plans to replicate Britain’s Science Media Centre (SMC) in the United States, which he said was “fraught with danger.”

Extracts: “The London SMC was set up because UK scientific leaders were upset that environmentalists had successfully fought the introduction of genetically modified food; they felt that the UK media were too susceptible to environmental scare stories about new technologies.

Despite the fears of the SMC founders, the British press — led by the BBC, which treats the Confederation of British Industry with the deference the Vatican gets in Rome — is overwhelmingly conservative and pro-business in its outlook. It is quite unperturbed by the fact that SMC sponsors include AstraZeneca, BP, Coca-Cola, L’Oreal, Monsanto, Syngenta (as well as Nature Publishing Group) but not a single environmental non-governmental organization (NGO) or trade union.

Fiona Fox, the SMC’s director, says that the centre operates independently of its sponsors and points out that none (except its host, the Wellcome Trust) accounts individually for more than 5% of its income. (However, examination of the Funding for 2014,⁴⁸ the total funding from industry and trade bodies (27% from 29 Organizations) exceeds any other source of funding apart from the Government & the Wellcome Trust). She adds that no NGOs are involved because it was their public-relations skills that the founders of the SMC sought to match.”

Macilwain goes on to say: “But the perception that the environmental group Friends of the Earth constitutes a bigger threat to scientific truth-telling than some of the corporate names on the SMC’s sponsorship list is not one the US media would accept. Some of those considering a US centre share these concerns. They think that their funding model will have to rely on charitable trusts, not companies or government agencies.

There are Science Media Centres in Japan, Canada, Australia and New Zealand

⁴⁷ <http://magz.elibraries.eu/ul/1826/Nature%20Magazine%207389%20-%202012-03-15.pdf>

go.nature.com/klnuna World View Nature 15th March 2012

⁴⁸ <http://www.sciencemediacentre.org/about-us/funding/>

Ms Fox took this as evidence that the 10-year-old centre was fulfilling its remit to prevent a repeat of incidents such as the uncritical reporting in 1998 of the claim - heavily criticised by the scientific community - made by Árpád Pusztai, a former researcher at the Rowett Research Institute in Aberdeen, that rats fed on GM potatoes had stunted growth and a repressed immune system.⁴⁹ She said that the relatively muted coverage in the UK contrasted with how the story was reported in other countries, particularly France, where it was "*front-page news everywhere*", prompting the French government to launch an inquiry into the study's findings. According to Ms Fox, the Science Media Centre's ability to gather a lot of expert comment quickly was particularly valuable in this instance because journalists who were shown the paper in advance of its publication were required to sign a highly unusual agreement that prevented them from sharing it with third parties. Critics claimed that this minimised the time journalists had to gather potentially negative commentary.

The London Science Media Centre protects Monsanto by issuing so-called 'expert' reactions to Séralini's studies involving glyphosate and GM, for the benefit of UK journalists

- The original paper in September 2012 when Séralini was accused of fraud.⁵⁰

One of the environmental Journalists who reported the article was John Vidal in the Guardian.⁵¹ "*But it was a triumph for the scientific and corporate establishment which has used similar tactics to crush other scientists...*He examined the 'experts' and found that they were pro-GM activists and some had worked for Monsanto.

- Expert reaction to EFSA initial review of GM maize⁵² 04/10/2012
- Expert reaction to EFSA Report that Séralini study conclusions were not supported by data⁵³ 28/11/2012
- Expert reaction to the withdrawal of Séralini's paper from the *Journal of Food and Chemical Toxicology* after a Monsanto scientist had been appointed to the Board.⁵⁴ 28/11/2013
- Reaction to the republication of the study in another journal⁵⁵ 24/06/2014

Séralini's group write a paper 'Laboratory Rodent Diets Contain Toxic Levels of Environmental Contaminants: Implications for Regulatory Tests'. *We describe the contamination with environmental pollutants of 13 laboratory rodent diets from 5 continents.*⁵⁶ At the same time Anthony Samsel issued analyses of samples of pet food contaminated with glyphosate.⁵⁷

- Expert reaction to study investigating content of and contaminants in laboratory rodent diets.⁵⁸

Séralini's group writes a paper: Transcriptome profile analysis reflects rat liver and kidney damage following chronic ultra-low dose Roundup exposure⁵⁹

Glyphosate-based herbicides (GBH) are the major pesticides used worldwide. Converging evidence suggests that GBH, such as Roundup, pose a particular health risk to liver and kidneys although low environmentally relevant doses have not been examined. To address this issue, a 2-year study in rats administering 0.1 ppb Roundup (50 ng/L glyphosate equivalent) via drinking water (giving a daily intake of 4 ng/kg bw/day of glyphosate) was conducted. A marked increased incidence of

⁴⁹ <https://www.timeshighereducation.com/news/research/research-intelligence-shock-troops-check-poor-gm-study/421361.article>

⁵⁰ http://www.sciencemediacentre.org/pages/press_releases/12-09-19_gm_maize_rats_tumours.htm

⁵¹ <http://www.theguardian.com/environment/2012/sep/28/study-gm-maize-cancer>

⁵² <http://www.sciencemediacentre.org/expert-reaction-to-efsa-initial-review-of-gm-maize/>

⁵³ <http://www.sciencemediacentre.org/expert-reaction-to-efsa-report-conclusion-that-seralini-study-conclusions-were-not-supported-by-data/>

⁵⁴ <http://www.sciencemediacentre.org/expert-reaction-to-reports-of-a-request-for-gilles-eric-seralini-to-withdraw-his-paper-on-the-effects-of-gm-maize-on-rats/>

⁵⁵ <http://www.sciencemediacentre.org/expert-reaction-to-republication-of-seralini-study-on-roundup-tolerant-gm-maize/>

⁵⁶ <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0128429>

⁵⁷ <http://farmwars.info/wp-content/uploads/2015/09/Riddled-with-Roundup1.jpg>

⁵⁸ <http://www.sciencemediacentre.org/expert-reaction-to-study-investigating-content-of-and-contaminants-in-laboratory-rodent-diets/>

⁵⁹ <http://www.ehjournal.net/content/14/1/70>

anatomorphological and blood/urine biochemical changes was indicative of liver and kidney structure and functional pathology. In order to confirm these findings we have conducted a transcriptome microarray analysis of the liver and kidneys from these same animals.

- The Science Media Centre seems to have run out of experts to inform journalists!

Prof Gilles-Eric Séralini and colleagues at CRIIGEN in Caen had questioned the adequacy of Monsanto's testing both for glyphosate and GM crops⁶⁰

"The 90-day-long tests are insufficient to evaluate chronic toxicity, and the signs highlighted in the kidneys and livers could be the onset of chronic diseases. However, no minimal length for the tests is yet obligatory for any of the GMOs cultivated on a large scale, and this is socially unacceptable in terms of consumer health protection. We are suggesting that the studies should be improved and prolonged, as well as being made compulsory, and that the sexual hormones should be assessed too, and moreover, reproductive and multigenerational studies ought to be conducted too."

THIS IS THE ORIGINAL PAPER IN QUESTION

Séralini's 2-year feeding study provoked chronic hormone and sex dependent pathologies in rats; males developed tumours at 4 months and females at 7 months⁶¹

"The health effects of a Roundup®-tolerant genetically modified maize (from 11% in the diet), cultivated with or without Roundup®, and Roundup® alone (from 0.1 ppb in water), were studied 2 years in rats. In females, all treated groups died 2–3 times more than controls, and more rapidly. This difference was visible in 3 male groups fed GMOs. All results were hormone and sex dependent, and the pathological profiles were comparable. Females developed large mammary tumours almost always more often than and before controls, the pituitary was the second most disabled organ; the sex hormonal balance was modified by GMO and Roundup® treatments. In treated males, liver congestions and necrosis were 2.5–5.5 times higher. This pathology was confirmed by optic and transmission electron microscopy. Marked and severe kidney nephropathies were also generally 1.3–2.3 greater. Males presented 4 times more large palpable tumors (kidney) than controls which occurred up to 600 days earlier. Biochemistry data confirmed very significant kidney chronic deficiencies; for all treatments and both sexes, 76% of the altered parameters were kidney related. These results can be explained by the non- linear endocrine-disrupting effects of Roundup®, but also by the overexpression of the transgene in the GMO and its metabolic consequences."

Authors' highlights:

- A Roundup®-tolerant maize and Roundup® provoked chronic hormone and sex dependent pathologies.
- Female mortality was 2–3 times increased mostly due to large mammary tumours and disabled pituitary.
- Males had liver congestions, necrosis, severe kidney nephropathies and large palpable tumours.
- This may be due to an endocrine disruption linked to Roundup® and a new metabolism due to the transgene.
- GMOs and formulated pesticides must be evaluated by long term studies to measure toxic effects.

European Network of Scientists for Social and Environmental Responsibility (ENSSER)⁶²

ENSSER condemned the retraction of Séralini's paper: *"In short, the decision to retract Séralini's paper is a flagrant abuse of science and a blow to its credibility and independence. It is damaging for*

⁶⁰ Séralini, G-E. et al. Genetically modified crops safety assessments: present limits and possible improvements

Environmental Sciences Europe 2011, 23:10 doi:10.1186/2190-4715-23-10. <http://www.enveurope.com/content/23/1/10>

⁶¹ <http://dx.doi.org/10.1016/j.fct.2012.08.005>

⁶² <http://www.ensser.org/democratising-science-decision-making/ensser-comments-on-the-retraction-of-the-seralini-et-al-2012-study/>

the reputation of both the journal Food and Chemical Toxicology and its publisher Elsevier. It will decrease public trust in science. And it will not succeed in eliminating critical independent science from public view and scrutiny. Such days and times are definitively over. Prof. Séralini's findings stand today more than before, as even this secret review found that there is nothing wrong with technicalities, conduct or transparency of the data – the foundations on which independent science rests. The conclusiveness of their data will be decided by future independent science, not by a secret circle of people.”

HOW THE UK GOVERNMENT HAS COLLUDED WITH THE AGROCHEMICAL CORPORATIONS AGAINST THE PUBLIC AND BIODIVERSITY

Why is the pesticides industry investing so much money in human health?

Syngenta's parent company is AstraZeneca. AstraZeneca manufactures six different anti-cancer drugs mainly aimed at breast and prostate cancer. The Corporation has links in Asia, including Hospitals in China, Japan, Korea, and collaborators in Russia. AstraZeneca's Oncology Website⁶³ has the following portentous prediction: “*Cancer claims over 7 million lives every year and the number continues to rise. Deaths are estimated to reach 12 million by 2030.*”

Michael Pragnell MA MBA was the founder of Syngenta and CEO of Syngenta AG based in Switzerland (from its public listing in 2000 to the end of 2007). He was appointed a Trustee of Cancer Research UK (CRUK) in March 2010 and Chairman in November 2010. CRUK is donating money (£450 million/year) to the Government's Strategy for UK Life Sciences⁶⁴ and AstraZeneca is providing 22 compounds to academic research to develop medicines.

Relationships between Syngenta, AstraZeneca and Defra/Fera

In 1997, Dr Peter Campbell went straight from being the Head of Ecotoxicology Branch at the Pesticides Safety Directorate in York into the post of Head of Ecological Sciences at Syngenta⁶⁵. In 2009 Syngenta and BBSRC gave £1 million to fund Warwick University and Rothamsted Research “to help to improve honeybee health”.⁶⁶ (Rothamsted had lost funding for its Bee Unit in 2006). Syngenta funded scientific assistants at Exeter University in 2012. Syngenta pioneered Operation Bumblebee in the UK and in 2010 announced expansion of programmes across Europe; up to €1 million over 5 years.⁶⁷ Programmes included “*What Operation Bumblebee can do for your golf course?*” Syngenta had representatives on the Advisory Committee on Pesticides (ACP), the Committee on Toxicity of Chemicals in Foods, Consumer Products and the Environment (COT), on the Panel to choose the Pollinator Initiative Projects and on the Government's Foresight Future of Farming Report.⁶⁸ Syngenta's parent company AstraZeneca had two representatives on COT. The CEO of Syngenta appears to be a core member of the Bilderberg Group and attends Bilderberg Meetings with the UK delegation of Ministers and others members of the global élite.⁶⁹

PUBLIC HEALTH ENGLAND: WORKING FOR THE GOVERNMENT AND CORPORATIONS

Obesity crisis: Sugar: spinning a web of influence⁷⁰

Public health scientists are involved with the food companies being blamed for the obesity crisis

Report by freelance journalist, Jonathan Gornall.

“An investigation by The BMJ has uncovered evidence of the extraordinary extent to which key public health experts are involved with the sugar industry and related companies responsible for many of

⁶³ <http://www.astrazeneca.co.uk/medicines/oncology>

⁶⁴ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32457/11-1429-strategy-for-uk-life-sciences.pdf

⁶⁵ <http://uk.linkedin.com/pub/peter-campbell/4/283/6ba>

⁶⁶ <http://www.bbsrc.ac.uk/news/archive/2009/091001-pr-1million-award-honeybee-decline.aspx>

⁶⁷ <http://www.bbsrc.ac.uk/news/archive/2009/091001-pr-1million-award-honeybee-decline.aspx>

⁶⁸ <http://www.bis.gov.uk/assets/foresight/docs/food-and-farming/11-546-future-of-food-and-farming-report.pdf>

⁶⁹ <http://www.biblebelievers.org.au/bball.pdf>

⁷⁰ <http://www.bmj.com/content/bmj/350/bmj.h231.full.pdf>

the products blamed for the obesity crisis through research grants, consultancy fees, and other forms of funding.” There is an interactive infographic, showing the ‘Tangled web: connections between the sugar industry and UK government advisory bodies. Links represent research funding, consultancy, and advisory board membership’

Among the main targets in the United Kingdom for an industry facing increasing pressure from government to reduce the health harms caused by its products are researchers working on nutrition issues for two key government funded organisations—the Scientific Advisory Committee on Nutrition (SACN) and the Medical Research Council’s Human Nutrition Research (HNR) unit at Cambridge. The BMJ has found that for more than a decade funding from industry has flowed to scientists involved with the research unit. Scientists working on Medical Research Council (MRC) projects have received research funding from organisations including Coca-Cola, PepsiCo, Nestlé, the Institute of Brewing and Distilling, Weight Watchers International, NutriLicious (a public relations firm specialising in conveying “nutrition and health messages” for the food industry), Sainsbury’s, W K Kellogg Institute, and GlaxoSmithKline.

Others received consultancy fees from Boots, Coca-Cola, Cereal Partners UK, Mars, and Unilever Foods. They have also sat on advisory boards for Coca-Cola, the Food and Drink Federation, and the Institute of Grocery Distributors.

Figures obtained through freedom of information requests suggest industry funding of the work of scientists in the Human Nutrition Research unit alone may have averaged close to £250 000 (£330 000; \$380 000) a year for the past decade. Industry funding for the three years from 2010 to 2012 totalled £697 469, peaking at £380 874 in 2010—5% of the unit’s income for the year...Researchers within the MRC’s units were ‘encouraged to work closely with the private sector, including the food industries...’

Funding pressures “For Alan Jackson, chair of SACN from 2001-2009, it is government funding policy that is to blame for driving scientists into the arms of industry.”

Corporate lobbyists find it easier to access the Prime Minister than his own MPs

An Editorial in the *British Medical Journal* on 11/01/2014 was entitled: A shameful episode.⁷¹

The UK government did a sudden U-turn from its agreement that a minimum price on a unit of alcohol would be introduced across the United Kingdom. “The evidence for substantial health savings and cost savings was clear. Scotland had introduced a minimum price (though now under legal challenge by the drinks industry) and the UK Prime Minister had given his personal commitment that England and Wales would follow suit.” Jeremy Browne the Home Office Minister said that the government didn’t have “enough concrete evidence.” However, Jonathan Gornall, in a BMJ investigation, discovered: “the extent and effects of contact between ministers and interest groups lobbying against the minimum unit price.”

Gornall concluded that the consultation itself was a sham. “While MPs struggled to gain access to ministers, representatives of alcohol companies and major supermarkets had easy access – made easier by the well-oiled revolving doors between industry and special advisory posts.” Academics quoted by Gornall express concern about the misuse of the scientific process by the alcohol industry and its mouthpiece. Alcohol companies were using tactics reminiscent of the tobacco industry. Documents released under a freedom of information request showed that between the coalition taking power in May 2010 and the end of 2013 the Department of Health alone had 130 meetings with representatives of the industry.⁷²

The extensive investigation shows “beyond doubt that commercial interests are currently in control of key decisions about the public’s health.

David Cameron met 26 times with officials of Murdoch’s News Corporation in the first 14 months of office, more than twice the number of visits he has had with any other media organization.⁷³

⁷¹ <http://www.bmj.com/content/348/bmj.g110>

⁷² jgornall@mac.com BMJ 2014;348:f7646

Big food, big pharma: is science for sale⁷⁴

Editor's Choice: Elizabeth Loder, acting head of research *The BMJ*. "We have grown accustomed to allegations of conflicts of interest, biased research, and manipulative marketing on the part of the drug industry. Sadly, this is not the only area where there is reason to be concerned about corporate influences on public policy. Crowcroft and colleagues examine the controversy over the UK government decision on public funding for a new vaccine (Bexsero) for meningococcal disease.⁷⁵ The problems they outline are all too familiar: "lobbying may have influenced the alteration" of the original decision. Links between some "vocal clinicians" and the drug industry were not disclosed. The lack of transparency makes it unsurprising that "conspiracy theories emerged, including the idea of undue influence of industry."

Public Health England's troubled trail⁷⁶

Jonathan Gornall, investigative journalist for the British Medical Journal, once again highlighted the poor record of Public Health England at protecting the public. In fact members of the House of Commons Health Select Committee on 19 November 2013 questioned the priority of the Report of the Impact of Fracking which concluded that the risks to public health were low:⁷⁷

"In conclusion, the currently available evidence indicates that the potential risks to public health from exposure to the emissions associated with shale gas extraction will be low if the operations are properly run and regulated. In order to ensure this, regulation needs to be strongly and robustly applied." This is at odds with the Report from the American Chemical Society (see next page). *"The handling of the evidence for its controversial report on e-cigarettes (19 August 2015)"⁷⁸ adds to questions about the credibility of the organisation's advice.* This review of the up-to-date evidence on e-cigarettes reported that *'e-cigarettes are 95% safer than tobacco.'*

HYDRAULIC FRACTURING (FRACKING) REPORT OF THE AMERICAN CHEMICAL SOCIETY

Environmental engineer William Stringfellow and colleagues at Lawrence Berkeley National Laboratory and the University of the Pacific told the American Chemical Society meeting in San Francisco that they scoured databases and reports to compile a list of the chemicals commonly used in fracking. Such additives which are necessary for the extraction process, include: acids to dissolve minerals and open up cracks in the rock; biocides to kill bacteria and prevent corrosion; gels and other agents to keep the fluid at the right level of viscosity at different temperatures; substances to prevent clays from swelling or shifting; distillates to reduce friction; acids to limit the precipitation of metal oxides. The researchers assembled a list of 190 of them, and considered their properties.⁷⁹ For around one-third of them, there was very little data about health risks, and eight of them were toxic to mammals. Fracking is a highly controversial technique, and has **not** been handed a clean bill of health by the scientific societies.

THE TASK FORCE ON SHALE GAS

Lord Chris Smith, former Chairman of the Environment Agency, was appointed in October 2014 to lead the independent, industry-funded Task Force on Fracking to look into the risks and benefits of

⁷³ <http://www.independent.co.uk/news/uk/politics/revealed-camerons-26-meetings-in-15-months-with-murdoch-chiefs-2314550.html>

⁷⁴ <http://www.bmj.com/content/350/bmj.h795>

⁷⁵ doi:10.1136/bmj.h308

⁷⁶ <http://www.bmj.com/content/351/bmj.h5826>

⁷⁷ <https://www.gov.uk/government/publications/shale-gas-extraction-review-of-the-potential-public-health-impacts-of-exposures-to-chemical-and-radioactive-pollutants>

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[https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/457102/E-cigarettes an evidence update A report commissioned by Public Health England FINAL.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/457102/E-cigarettes_an_evidence_update_A_report_commissioned_by_Public_Health_England_FINAL.pdf)

⁷⁹ <http://fracfocus.org/chemical-use/what-chemicals-are-used>

fracking in the UK.⁸⁰ On 15 July 2013 *The Independent* newspaper had revealed the conflicts of interest at the heart of decision making.⁸¹

Lord Browne: The former BP boss is chairman of Cuadrilla, which is exploring for shale gas in Lancashire and West Sussex. He is lead "non-executive" across Government, meaning that he helps recruit other non-executives to Whitehall.

Baroness Hogg: The non-executive for the Treasury sits on the board of BG Group, which has significant shale gas assets in the United States.

Sam Laidlaw: The non-executive to the Transport Department is also chief executive of British Gas owner Centrica, which recently bought a 25 per cent stake in Cuadrilla's most promising shale gas prospect.

Ben Moxham: A former executive at BP when Lord Browne was at the helm, he followed the peer to Riverstone Holdings, which owns 42 per cent of Cuadrilla. Moxham was energy adviser at No 10 but quit in May.

Lord Howell: George Osborne's father-in-law is also president of the British Institute of Economics, whose backers include BP and BG Group. A senior Conservative peer, who is George Osborne's father-in-law, provoked anger and surprise today after he suggested "fracking" for shale gas should be limited to the North East of England because it has "*large and uninhabited and desolate areas*".⁸² In March 2015, Lord Chris Smith told the Guardian he was hugely sceptical about fracking.⁸³

However, Lord Chris Smith changed his mind. On September 16th 2015: Third Report of the Task Force on Shale Gas was published: Assessing the Impact of Shale Gas on Climate Change.⁸⁴ Extract from Conclusions and Recommendations: *"Therefore the Task Force concludes – in line with the thinking of relevant forecasting organisations – that there is a requirement for gas to play a significant role in the UK's energy mix in the short and medium term. The evidence suggests that the impact of shale gas on the climate is similar to that of conventional gas and less than that of LNG. If this is the case, based on the evidence outlined above, the Task Force is persuaded that, if properly regulated, implemented and monitored, shale gas should be explored as a potential gas source to meet UK energy needs. The Task Force also believes that everything possible should be done to minimise the climate impact of gas extraction in the UK."*

HISTORY OF FARMING WITH CHEMICALS IN THE UK

THE AGROCHEMICAL INDUSTRY HAS WORKED WITHIN GOVERNMENT SINCE BEFORE WW2

Rothamsted Research is the longest running agricultural research station in the world

When UK Rothamsted was founded in 1843, it was an enormous tragedy that the philanthropist John Bennet Laws, owner of the Rothamsted Estate appointed a **chemist** as his scientific collaborator. This set the pattern for farming in the UK: to rely totally on the agrochemical industry and the input of chemicals.

Rothamsted developed the first chemical herbicide

The herbicide, 2,4-D was developed during World War II at British Rothamsted Experimental Station (at the same time as in the US) by Judah Hirsch Quastel and sold commercially in 1946.⁸⁵

⁸⁰ <http://www.theguardian.com/environment/2014/oct/21/former-environment-agency-head-to-lead-industry-funded-fracking-task-force>

⁸¹ <http://www.independent.co.uk/news/uk/politics/revealed-fracking-industry-bosses-at-heart-of-coalition-8707589.html>

⁸² <http://www.independent.co.uk/news/uk/politics/former-energy-minister-lord-howell-george-osborne-s-father-in-law-says-it-s-fine-to-frack-in-empty-8738634.html>

⁸³ <http://www.theguardian.com/environment/2015/mar/25/lord-smith-hugely-sceptical-of-fracking-for-shale-oil-in-the-uk>

⁸⁴ <https://darkroom.taskforceonshalegas.uk/original/8879c0b838c6e09864638cbd6902b190:7f5b9e74c66410cff3253321938981d6/right-report.pdf>

⁸⁵ <http://www.rothamsted.ac.uk/about>

'The low cost of 2,4-D has led to continued usage today and it remains one of the most commonly used herbicides in the world.' However, on 23/06/2015, WHO International Agency for Research on Cancer classified 2,4-D as a Group 2B carcinogen (possibly carcinogenic to humans).⁸⁶ There was strong evidence that 2,4-D induces oxidative stress that can operate in humans and moderate evidence the 2,4-D causes immunosuppression, based on in-vivo and in-vitro studies."⁸⁷ A recent article from the US shows that total herbicide (glyphosate) volume applied to GM corn, cotton and soybeans increased from 240,500,000 lbs/year in 1994 to 301,000,000 lbs/year in 2010.⁸⁸ Dow has applied in the US for new GE seeds.⁸⁹ Enlist Duo is a combination of the herbicides 2,4-D and glyphosate. The approval (by the US EPA) will increase use of 2,4-D by two-to sevenfold, reaching as much as 176 million pounds. In a press release January 3 2014 Dow noted that "*an astonishing 86 percent of corn, soybean and cotton growers in the South have herbicide-resistant or hard-to-control weeds on their farms,*" as do more than 61 percent of farms in the Midwest. "*Growers need new tools now to address this challenge,*" Dow insisted. According to Tom Philpott: "*The use of 2,4-D—the less toxic half of the infamous Vietnam-era defoliant Agent Orange—had been dwindling for years, but the rise of Roundup®-resistant super-weeds has revived it.*" Is that why 2,4-D is registered in the EU and in the UK? The US EPA announced (25/11/2015) that they are suspending Enlist Duo citing high toxicity.⁹⁰

Nature Conservancy Council (NCC) exposes DDT and Dieldrin as the cause of raptor declines

A review of *Pesticides and Birds* published in 1965 by the Head of the NCC's Pesticide Monitoring Unit at Monks Wood Experimental Station stated that 200 chemicals were being used by farmers and were having a devastating effect on birds. The post-war crash in raptor populations was finally linked to the new organochlorine pesticides, DDT and dieldrin. [N.B. The neonicotinoid insecticide clothianidin is 10,800 more toxic to bees, dose for dose, than DDT was in 1945⁹¹]. The late Derek Radcliffe, Chief Scientist of the NNC, said in his autobiography: ⁹² "*Despite much prevarication and obscurantism from the agricultural establishment and agrochemical interests*" the UK Advisory Committee on Pesticides was persuaded to bring in successive restrictions on their use, first in 1962, and then extended to 1964. Only finally, 20 years later, in 1982, EU regulations required a formal ban on all the organo-chlorine pesticides except lindane.

FROM THE 1970s INTO THE 2000s INDUSTRY HAS BEEN GIVEN FREE REIN

Even in the 1970s the Agricultural Industry was given massive power by the British Government

Robert van den Bosch, writing in 1978 in *The Pesticide Conspiracy*:⁹³ "If one considers how dangerous these chemicals are, one would suppose that it would be Government policy to minimize their use by every possible means. However the Royal Commission on Environmental Pollution notes, '*there is... no such policy in the UK, nor does the possible need for it appear to have been considered, notwithstanding the great increases in the use of these chemicals.*'"

The Agrochemical Industry, on the contrary, seems to be under the impression it is Government policy to encourage the maximum use of pesticides. Thus according to the Agrochemical industry, of 367,000 acres of potatoes grown in this country in 1976, 310,000 acres are treated with herbicides, 114,000 acres with granular insecticides and nematocides, 218,000 acres with foliar insecticides and

⁸⁶ [http://www.thelancet.com/pdfs/journals/lanonc/PIIS1470-2045\(15\)00081-9.pdf](http://www.thelancet.com/pdfs/journals/lanonc/PIIS1470-2045(15)00081-9.pdf)

⁸⁷ http://www.iarc.fr/en/media-centre/pr/2015/pdfs/pr236_E.pdf

⁸⁸ <http://www.motherjones.com/tom-philpott/2014/01/usda-prepares-greenlight-chemical-war-weeds>

⁸⁹ Dow's Enlist GE corn and soybeans are genetically engineered (GE) to be resistant to several herbicides, including one known as 2,4-D.

⁹⁰ <http://www.panna.org/press-release/epa-pulls-registration-dow-enlist-duo-herbicide-citing-high-toxicity-levels>

⁹¹ My thanks to Dr Jean-Marc Bonmatin Centre, National de la Recherche Scientifique, Orleans, France for allowing me to quote from his slide on the relative toxicities to bees of the neonicotinoid insecticides to DDT.

⁹² Ratcliffe, D.A. *In Search of Nature*. Peregrine Books 2000.

⁹³ Van den Bosch, R. *The Pesticide Conspiracy*: USA Doubleday & Company (1978): Dorchester, UK: Prism Press (1980).

265,000 acres with fungicides.⁹⁴ In this way one acre of potatoes, the industry boasts, can be treated from 2-11 times with different pesticides.” Van den Bosch also condemns the UK for aerial spraying. *“What is particularly shameful in this country is the prevalence of aerial spraying. One million acres of agricultural land are sprayed each year, which involves 34,000 flights. Controls on this practice are practically non-existent...nor as the Royal Commission points out, does there appear to be any controls on the type of spraying equipment.”*

The Royal Commission on Environmental Pollution was abolished on 1 April 2011, as part of the Coalition Government's spending cuts. It had been created under Royal Warrant in 1970 to advise the Queen, Government, Parliament and the public on environmental issues.

AERIAL SPRAYING IS STILL USED IN 2015

Sustainable Use of Pesticides 21 October 2009: DIRECTIVE 2009/128/EC OF THE EUROPEAN PARLIAMENT⁹⁵ EU Directive Advice and the UK Government's Response (which is unsustainable)

Article 9 Aerial Spraying

EU Directive Advice: Aerial spraying of pesticides has the potential to cause significant adverse impacts on human health and the environment, in particular from spray drift. Therefore aerial spraying should generally be prohibited with derogations possible where it represents clear advantages in terms of reduced impacts on human health and the environment in comparison with other spraying methods, or where there are no viable alternatives, provided that the best available technology to reduce drift is used.

UK Government Response: We do not consider that responsible application of pesticides by aerial spraying poses an unacceptable risk to human health and the environment, and consequently we will use the derogation. We believe that the existing legislation control regime provides a basis for meeting the Directive and this will be adapted to ensure the continuation of properly regulated aerial applications through a consent-based approach.

Article 10 Protection of water

EU Directive Advice: The aquatic environment is especially sensitive to pesticides. It is very necessary for particular attention to be paid to avoiding pollution of surface water and groundwater by taking appropriate measures such as the establishment of buffer and safeguard zones, or planting hedges along surface water to reduce exposure of water bodies to spray drift, drain flow and run-off. The dimensions of buffer zones should depend in particular pesticide properties, as well as agricultural characteristics of the areas concerned.

Government Response: Current statutory and voluntary controls related to pesticides and the protection of water, if followed, afford a high degree of protection to water courses and cover specific measures detailed in the Directive. The Government will primarily seek to work with the pesticides industry to enhance voluntary measures.

Article 11 Use of pesticides in specific areas

EU Directive Advice: Use of pesticides can be particularly dangerous in very sensitive areas such as Natura 2000 sites protected in accordance with Directives 79/409/EEC and 92/43/EEC. In other places such as public parks and garden, sports and recreation grounds, school grounds and children's play grounds, and in the close vicinity of healthcare facilities, the risks from exposure to pesticides is high. In these areas, the use of pesticides should be minimised or prohibited. When pesticides are used, appropriate risk management measures should be established and low-risk pesticides as well as biological control measures should be considered in the first place.

Government Response: We do not consider it necessary to prohibit the use of pesticides in public spaces or conservation areas or to impose new statutory controls on pesticide use in these areas.

⁹⁴ Industry's Statistics: British Agrochemical Association London 1976

⁹⁵ <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0128>

We believe that the UK can meet its obligations under the Directive through existing statutory and voluntary controls and develop additional voluntary measures.

Plant Protection Products Regulation (PPP) (EC) No 1107/2009

The consultation sought views on whether and how specific provisions in the PPP Regulation should be implemented in the UK.

Article 31 included an optional provision that could allow future product authorisations to include obligation to provide advance notice to any neighbours who could be exposed to the spray drift and who have requested to be informed. The British Medical Association with regard to Article 31, wanted advance notification, so that vulnerable patients, such as those suffering from respiratory problems, may be alerted in advance of spraying.

Government Response: We do not believe that it is appropriate to introduce a statutory requirement for operators to give advanced notice of planned spray operations to members of the public living adjacent to sprayed land. We will continue to encourage farmers and spray operators to develop good relations with their neighbours.

EU Directive Advice: Research programmes aimed at determining the impacts of pesticide use on human health and the environment, including studies on high-risk groups, should be promoted.

Extract from Document addressed to the Chemical Regulation Directorate of the Health and Safety Executive in response to the CRD's reply on behalf of The Right Hon James Paice MP, Minister of Agriculture (dated 20th December 2010) on 06/01/2011

"Large amounts of pesticides are reputed to be sprayed on US golf courses each year to remove any invertebrate that dares to spoil the greens. A study by Kross et al. on 618 golf course superintendents (and their workers) who managed turf on golf courses in the US showed that they died of cancer more often than the general public.⁹⁶ Two years ago (2008) the EU had intended to ban the use of pesticides on golf courses, but such was the outcry from the powerful golf lobby that golf courses were made an exception. Presumably as the holder of the records of applications of pesticides on golf courses in the UK, the Chemicals Regulation Directorate would be in an ideal position to conduct such a study themselves. This is particularly relevant to Dr Tennekes' observations that these chemicals are similar in structure to known carcinogens. Unfortunately, the public has no direct access to records so any study must be undertaken from your records, and perhaps those of Defra."

The following Press Release was issued: Lord Henley, the then Under-Secretary of State for Defra, said: "As UK pesticides safety standards are already amongst the highest in Europe, only minor changes are necessary to meet the new requirements and no compelling evidence was provided in the responses to justify further extending existing regulations and voluntary controls."... "We have to protect the public and the environment from harm and will do so by following sound scientific and other evidence. By making a small number of changes to our existing approach we can continue to help feed a growing global population with high-quality food that's affordable – while minimising the risks of using pesticides".

In 2011 the Pesticides Forum confirmed what the Government wanted to hear

"The work of the UK Pesticides Forum in 2011 confirms that the use of pesticides is not adversely impacting on the health of UK citizens or the environment...This is testimony to the effectiveness of both statutory and voluntary controls."

⁹⁶ Kross BC et al. Proportionate mortality study of Golf Course Superintendents. *American Journal of Industrial Medicine* 29 (1996): 501-06: Reported a 23% increase in Non-Hodgkin's Lymphoma, a 29% increase in prostate cancer and a 17% increase in brain cancer. [http://onlinelibrary.wiley.com/doi/10.1002/\(SICI\)1097-0274\(199605\)29:5%3C501::AID-AJIM8%3E3.0.CO;2-O/abstract](http://onlinelibrary.wiley.com/doi/10.1002/(SICI)1097-0274(199605)29:5%3C501::AID-AJIM8%3E3.0.CO;2-O/abstract)

Tony Blair, Monsanto and the Royal Society combine to discredit Dr Arpad Pusztai when he found that rats fed GM potatoes had complications; his lab was closed down

This scandal involved Tony Blair and the Royal Society.⁹⁷ On 10 August 1998 in a Granada 'World in Action' broadcast⁹⁸ Dr Arpad Pusztai (a GM expert leading the team at the Rowett Institute) explained his research that showed that rats fed with genetically modified potatoes had suffered immune damage. He raised questions about the safety of GM food in the human diet on the basis of the study. The news flashed around the world. Professor Robert Orskov OBE who had worked at the Rowett Institute for 33 years was told that phone calls went from Monsanto, the American firm which produces 90% of the world's GM food, to Clinton and then to Blair. "*Clinton rang Blair and Blair rang James*" (Professor James, Director of the Rowett Institute). "*There is no doubt he was pushed by Blair to do something. It was damaging the relationship between the USA and the UK, because it was going to be a huge blow for Monsanto.*" Dr Pusztai lost his job and his Laboratory in the Rowett Institute was closed down.

ADAS recommended pre-harvest crop spraying with Roundup® in 1980⁹⁹ and spraying on grassland in 1985. Researches showed two Monsanto scientists wrote the first papers (without declaring it)

In 1980 UK ADAS¹⁰⁰ (at that time the science and advisory branch of Ministry of Agriculture, Fisheries and Food (MAFF) but now privatised) was recommending that arable farmers use pre-harvest application of glyphosate on cereal crops. M.G. O'Keeffe, a Monsanto scientist¹⁰¹ wrote three articles about it, the first at a Crop Protection conference.¹⁰² They do not appear to have been peer-reviewed. By 1985 ADAS was advocating the use of glyphosate on grassland. They declared it to be good practice to graze the grass or preserve it as hay or silage after treatment.¹⁰³ However, the main author of the paper was another Monsanto scientist, Colin D Stride.¹⁰⁴ He later joined Exponent®, a firm which provides services for industry, governments and for EU regulatory bodies.¹⁰⁵

In a 4-month project starting in the UK in January 2007: Pre-harvest glyphosate for weed control and as a harvest aid in cereals¹⁰⁶ the authors stated in their introduction:

"Concern over residues, as expressed by the Food Safety Authority Report, appears to relate to the incidence of residues rather than to the levels of the residues. Data from Monsanto and Cessna et al. (1994 & 2002) suggest that the level of residues is associated with dose but that even the lower doses used for harvest aid will leave detectable levels at harvest. Hence, any initiative to reduce the

⁹⁷ <http://www.psrastr.org/pusztblair.htm>

⁹⁸ <http://news.bbc.co.uk/1/hi/health/149882.stm>

⁹⁹ <http://www.hgca.com/media/185527/is02-pre-harvest-glyphosate-application-to-wheat-and-barley.pdf>

¹⁰⁰ ADAS is now the UK's largest independent provider of agricultural and environmental consultancy, rural development services and policy advice; formerly a branch of Ministry of Agriculture, Fisheries & Food. (MAFF)

¹⁰¹

https://books.google.co.uk/books?id=objYBAAQBAJ&pg=PA555&lpg=PA555&dq=Monsanto+O%27Keeffe+MG&source=bl&ots=3k7GWMRWZ3&sig=w0ZhiNFMTY86cNp_cP3jV4Dz3A&hl=en&sa=X&ei=Twz-VPmWA8mBU93GggP&ved=0CEkQ6AEwBg#v=onepage&q=Monsanto%20O'Keeffe%20MG&f=false

Chemical Manipulation of Crop Growth and Development Proceedings of Previous Easter Schools in Agricultural Science by J. S. McLaren

¹⁰² O'Keeffe MG. The control of Agropyron repens and broad-leaved weeds pre-harvest of wheat and barley with the isopropylamine salt of glyphosate; 1980. pp. 53–60. Proceedings of British Crop Protection Conference-Weeds.

¹⁰³ Stride CD, Edwards RV, Seddon JC. Sward destruction by application of glyphosate before cutting or grazing; 1985. pp. 771–778. British Crop Protection Conference – Weeds 7B–6.

¹⁰⁴ http://www.exponent.com/files/Attorney/2f28f368-0f2c-48d0-91c2-60589cce38f1/Presentation/ceExpertCVUupload/stride_c_full.pdf

¹⁰⁵ "Exponent, Inc., a research and scientific consultant firm with clients from industry (including crop protection) and government" Mr. Stride compiles national and zonal dRR format biological assessment dossiers and dRR evaluation dossiers to meet the needs of Regulation 1107/2009 for plant protection products for re-registration at Annex III or new active substances at Annex I. He also provides advice on efficacy and trial programmes; conducts data gap analyses, identifying potential problems and solutions, drafts efficacy protocols to fit EU guidelines and good agronomic practice, and can manage efficacy testing programmes including study monitoring and ensuring reporting standards are high. He also compiles study summaries and tiered dossiers for Biocides in IUCLID5.

¹⁰⁶ http://archive.hgca.com/publications/documents/cropresearch/RR65_Final_Research_Review.pdf

incidence of residues must be to reduce the proportion of the crop sprayed rather than to reduce the dose of the individual applications.” However, they do not appear to have performed any glyphosate residue measurements.

Glyphosate is used for ripening sugar cane ‘to increase the sucrose content’

In the US and Latin America, glyphosate is used to ripen sugar-cane.¹⁰⁷ *“Chemical ripening of sugar cane is an important component to profitable sugar production in the United States as well as other sugarcane industries throughout the world.”* But the price paid for sugar cane to be profitable to the corporations is an alarming increase in renal failure in young male agriculture workers in Louisiana and South America. Louisiana’s death rate per 100,000 from nephritis/kidney disease is 26.34 per 100,000 as compared with a US rate of 14.55.¹⁰⁸

Costa Rica has a similar pattern of chronic renal disease.¹⁰⁹ In 2005 Cerdas reported that: *“in the north part of the country, in Guanacaste, in the last five years there has been an epidemic of chronic renal failure. The demographic features of patients are very interesting. All are young men, between the ages of 20 and 40 years, with a clinical and pathologic picture of chronic interstitial nephritis. The most interesting feature of these patients is epidemiologic—all of them are long-term sugar-cane workers. A specific study of their work environment is needed to determine what in their daily activities puts them at increased risk for chronic renal failure.”*

A NEW PAPER REVEALS MONSANTO’S SECRET STUDIES: MONSANTO KNEW THAT GLYPHOSATE CAUSED CANCER IN ANIMALS BUT MANIPULATED THE DATA¹¹⁰

Monsanto has known since the 1970s that glyphosate causes cancer, according to a new paper by researchers Anthony Samsel and Stephanie Seneff. Samsel is the first independent researcher to examine Monsanto’s secret toxicology studies on glyphosate. Samsel obtained the studies through a request to his senator. With Dr Stephanie Seneff of MIT, he reviewed Monsanto’s data. Samsel and Seneff concluded that *“significant evidence of tumours was found during these investigations”*.

Extract: *Glyphosate has a large number of tumorigenic effects on biological systems, including direct damage to DNA in sensitive cells, disruption of glycine homeostasis, succinate dehydrogenase inhibition, chelation of manganese, modification to more carcinogenic molecules such as N-nitrosoglyphosate and glyoxylate, disruption of fructose metabolism, etc. Epidemiological evidence supports strong temporal correlations between glyphosate usage on crops and a multitude of cancers that are reaching epidemic proportions, including breast cancer, pancreatic cancer, kidney cancer, thyroid cancer, liver cancer, bladder cancer and myeloid leukaemia.*

In 1985 the US EPA classified glyphosate as a Group C carcinogen but changed to Group E in 1991¹¹¹

The original Panel comprised of members of the Toxicology Branch of the Hazard Evaluation Division which examined the carcinogenic potential of glyphosate. In a consensus review on March 4 1985 the Committee classified glyphosate as a Group C carcinogen. It was based on the incidence in rats/mice of **renal tumours, thyroid C-cell adenomas and carcinomas, pancreatic islet cell adenomas, hepatocellular adenomas and carcinomas** in males. However, in 1991 The Health Effects Division Carcinogenicity Peer Review Committee met on June 26 1991 to discuss and evaluate the weight of evidence on glyphosate with particular emphasis to its carcinogenic potential. In a review of the data the Committee concluded that glyphosate should be classified as Group E (evidence of non-carcinogenicity for humans). In order to cover themselves they declared: *“It should*

¹⁰⁷ <http://dx.doi.org/10.1614/WS-D-09-00001.1>

¹⁰⁸ Network Coordinating Council (May 2013) 2012 Annual Report: Quoted in Samsel & Seneff

¹⁰⁹ <http://www.nature.com/ki/journal/v68/n97s/full/4496413a.html>

¹¹⁰

https://www.academia.edu/17751562/Glyphosate_pathways_to_modern_diseases_IV_cancer_and_related_pathologies

¹¹¹ http://www.epa.gov/opp00001/chem_search/cleared_reviews/csr_PC-103601_30-Oct-91_265.pdf

be emphasized, however, that the designation of an agent in Group E is based on the available evidence at the time of evaluation and should not be interpreted as a definitive conclusion that the agent will not be a carcinogen under any circumstances"

There were signatures of the 11 members present, six members signed *in absentia* but three members refused to sign because they "did not concur." Presumably they knew that the change of classification of glyphosate from Group C to Group E was fraudulent.

Farmers in the UK continued to spray glyphosate pre-harvest between 1985 and 1991 even though in that period the US EPA had said it was carcinogenic to humans

In 1991 Monsanto persuaded the US EPA Health Effects Division Carcinogenicity Peer Review Committee to downgrade it to Group E (evidence of non-carcinogenicity for humans). Monsanto was beginning to develop Genetically Modified crops that were tolerant to glyphosate (Roundup® Ready) which they launched in Latin America and the US in 1996.

The existing UK Government policy and approvals system fundamentally fails to protect people in the countryside from pesticides, particularly rural residents – Georgina Downs

This is the assertion of Georgina Downs who founded UK Pesticides Campaign in 2001.¹¹² Her evidence to the Parliamentary Environmental Audit Committee on Insects and Insecticides in Session 2012/13 can be read here.¹¹³

Georgina Downs has courageously fought legal battles against Defra on behalf of rural communities, who at that time (and still are) being regularly sprayed with pesticides. She had a landmark victory in the High Court in November 2008 that ruled that the UK Government's policy on pesticides was not in compliance with European legislation.¹¹⁴ It was the first known legal case of its kind to reach the High Court to directly challenge the Government's pesticide policy and approach regarding crop-spraying in rural areas. However, it was not for long. The Court of Appeal overturned the High Court Judgment in May 2009.¹¹⁵ Chief Executive, Kerr Wilson's Witness Statements cited various reasons for preserving the *status quo*. They were related to alleged financial and economic impacts on manufacturers, farmers and distributors, or the impact on agricultural productivity. On behalf of Defra he did not display any concern whatsoever in relation to the protection of public health. His main concern was with protection of industry and business interests. *"The annual market value of pesticide sales is approximately £490m which delivers benefits to farmers, significantly improving agricultural productivity"...* *"If, as a result of the Declaration, new approvals could not be granted, there would be important ramifications."* Some pro-industry Press reports at the time supported the Government's stance; that if the High Court Judgment stood then the *"Government's pesticide policy would be fundamentally undermined"* and that the policy and approvals system *"might even grind to a halt."*

Read Georgina's recent article in *The Ecologist*: It's not just glyphosate and neonicotinoids – we need a pesticide-free future.¹¹⁶

Defra Expert Committee on Pesticide Residues in Food¹¹⁷

This is why we all have glyphosate residues in our bodies: it is in our staple foods

¹¹² <http://www.pesticidescampaign.co.uk/>

¹¹³ <http://www.publications.parliament.uk/pa/cm201213/cmselect/cmenvaud/writev/668/m28.htm>

¹¹⁴ <http://www.theguardian.com/environment/2008/nov/15/activists-pollution-pesticides-toxins-defra>

¹¹⁵ <http://www.theguardian.com/environment/2009/jul/07/georgina-downs-pesticides>

¹¹⁶

http://www.theecologist.org/News/news_analysis/2848400/its_not_just_glyphosate_and_neonicotinoids_why_we_need_a_pesticidefree_future.html

¹¹⁷ <http://www.pesticides.gov.uk/guidance/industries/pesticides/advisory-groups/PRiF/about-PRiF>

The results from monitoring of Pesticide Residues in food have been published quarterly since 2000. Bread and breakfast cereals are staple foods but there are no maximum residue limits (MRLs) for bread or cereals. Residues in bread are tested twice a year.

2002 3rd Quarter: Comments: “Residues of chlormequat,¹¹⁸ glyphosate and pirimiphos-methyl¹¹⁹ were found (in bread). These pesticides are commonly used on cereal crops, and residues have been found in other cereal products, therefore these findings are not unexpected. None of the residues found were of concern for consumer health.

2006 3rd Quarter: Comments: “Eating more starchy foods, like bread, is an important part of the Food Standards Agency’s (FSA) advice on healthy eating. The incidence of pesticide residues in bread is relatively high, but our assessment of the risk indicates that the levels we have found in this survey would not be expected to have an effect on health.”

2007 3rd Quarter: Comments: “Eating more starchy foods, like bread, is an important part of the FSA’s advice on healthy eating. We often find pesticide residues in bread but our assessment of the risk indicates that the levels we have found in this survey would not be expected to have an effect on health. We have asked the Secretariat to write to the Home Grown Cereals Authority about the incidence of residues”. I couldn’t find a reply.

2011 3rd/4th Quarters for Lentils: Comments: Sixteen samples of lentils contained glyphosate above the MRL. A new higher level of glyphosate is expected to come into force in summer 2012. None of the residues detected in this survey would be above the new proposed MRL.”

The use of glyphosate for desiccation on both barley and wheat was accepted by the brewing and distilling industries in 2007¹²⁰ therefore it is probable that men are more likely to be overweight because of the consumption of beer or whisky with glyphosate residues. Many foods imported from the US have GM ingredients and will contain glyphosate (or other herbicide residues). These include products which are made from corn or soya, such as energy bars, sugar drinks; and fruit or vegetables. The US still does not require labelling of GM.

Animals in the UK are fed with imported GM soya and maize which has been shown by Bohn *et al.*¹²¹ to have marked compositional differences from organic and conventional soya beans (i.e. GM food and feed is not substantially equivalent to non-GM as claimed by the FDA in 1992.)¹²²

- Glyphosate tolerant GM soybeans contain high residues of glyphosate and AMPA (mean 3.3 and 5.7 mg/kg, respectively).
- Soybeans from different agricultural practices differ in nutritional quality.
- Organic soybeans showed a more healthy nutritional profile than other soybeans; more sugars, protein, and zinc. Organic soybeans also contained less total saturated fat and total omega-6 fatty acids than both conventional and GM-soy.

“Using 35 different nutritional and elemental variables to characterise each soy sample, we were able to discriminate GM, conventional and organic soybeans without exception, demonstrating substantial non-equivalence” in compositional characteristics for’ ready-to-market’ soybeans”

When the CRD Head of Regulatory Policy replied on 28/02/2014 to defend the authorisation of glyphosate, he told me that the capability to detect individual pesticides in food had increased from 150 in 2003 to 393 in 2012. He stated: “In the 2012 Report, although there were a large number of residues found in bread, none of these were at a level to suggest a risk to consumer health.”

However, he failed to reply to my question as to why EFSA was regularly increasing the Maximum

¹¹⁸ Chlormequat, a plant growth regulator was present consistently throughout.

¹¹⁹ pirimiphos-methyl, is an organophosphate insecticide for use in storage. The approval was revoked on 24/03/2011, but it was only finally banned 31/03/2013, presumably to allow stocks to be used up.

¹²⁰ Notes on the use of Roundup® products on malting, milling and seed crops: Monsanto UK Ltd 2007.

<http://www.grainfarmers.co.uk/seeddownloads/Roundup%20on%20seed%20%20milling%20and%20malting.pdf>

¹²¹ <http://www.sciencedirect.com/science/article/pii/S0308814613019201>

¹²² <http://www.fas.org/biosecurity/education/dualuse-agriculture/2.-agricultural-biotechnology/us-regulation-of-genetically-engineered-crops.html>

Residue Limits (MRLs) of glyphosate in foods at the request of Monsanto to accommodate their practice of desiccation of crops and to protect their imports into Europe.

EFSA's Reasoned Opinion Panel increases MRLs at the request of industry (Monsanto in this case, to 100 times the previously authorised MRL)

Monsanto Europe asked EFSA to set the import tolerance for glyphosate in lentils "*in order to accommodate the authorised desiccation use of glyphosate in lentils in the US and Canada*" from 0.1 mg/kg to 10 mg/kg¹²³ (i.e. 100 times: January 2012). EFSA had granted similarly elevated MRLs for glyphosate on wheat and GM soya.

In June 2012, a secret meeting was held between the Agricultural Biotechnology Council (ABC), representing industry, two UK Ministers, two MPs, Civil Servants, Scientists and NFU to discuss the barriers to introducing Genetically Modified Crops (GM) into Britain and how to overcome them

On 25th October 2012 Dr Helen Wallace Director of Genewatch and Pete Riley Campaign Manager GM Freeze published a Press Release:¹²⁴ Monsanto meets Ministers to push return of GM crops to Britain. On 26 June 2012, Roundtable discussion on 'Going for Growth': Realising the potential of agricultural technologies in the UK. Attendees¹²⁵ included Government Ministers, MPs, Civil Servants from Defra, the Department of Business, Innovations and Skills, Office of Life Sciences, Director of the Centre for Food Security, John Innes Centre, Rothamsted Research, James Hutton Institute, the National Farmers Union and the Agricultural and Horticultural Development Board. Here are the links to the Agenda¹²⁶ and a summary of the meeting.¹²⁷ The ABC had also communicated with the Food Standards Agency (FSA). These organisations or individuals have colluded with industry.

George Freeman MP, one of those present, was appointed by David Cameron as Parliamentary Under Secretary of State for Life Sciences at the Department for Business, Innovation and Skills and the Department of Health on 15 July 2014. He has a large portfolio at the Department of Health: nine subjects including genomics, medicine and industry.¹²⁸

The British Government is in favour of the application to authorise EU cultivation of GM maize Pioneer 1507

(Approved by the European Commission in November 2013¹²⁹ *this SmartStax maize is genetically engineered to produce six insecticidal proteins and is resistant to two herbicides, glyphosate and glufosinate. The combination effects between residues from spraying and the insecticidal toxins have **never** been investigated and feeding studies have **never** been done*). Testbiotech has made the first meta-analysis of some of the data on genetically engineered maize 1507 submitted by industry to authorities in the EU, the US, Australia and New Zealand for their approval procedures: Genetically engineered maize 1507: Industry and EFSA disguise true content of Bt toxin in the plants.¹³⁰ *Looking at the data it is evident that there is no consistent method of data acquisition or evaluation. For example, although the application of the herbicide glufosinate appears to have a substantial impact on the Bt content in the plants, only a very small amount of comparative data was submitted to the authorities. Furthermore, important data on, for example, the Bt content in the roots are largely missing. They conclude: Data insufficient to conclude on the safety of the plants.*

¹²³ <http://www.efsa.europa.eu/en/efsajournal/pub/2550.htm>

¹²⁴ <http://www.genewatch.org/article.shtml?als%5Bcid%5D=569457&als%5Bitemid%5D=571449>

¹²⁵ <http://tinyurl.com/9jbce4g>

¹²⁶ <http://tinyurl.com/8ahylza>

¹²⁷ <http://tinyurl.com/92rrajn>

¹²⁸ <https://www.gov.uk/government/ministers/parliamentary-under-secretary-of-state--42>

¹²⁹ <http://www.testbiotech.de/node/940>

¹³⁰ http://www.testbiotech.org/sites/default/files/Testbiotech_Bt_Expression_Data_1507_0.pdf

The EFSA GMO Panel (Chairman Prof Joe Perry, formerly Rothamsted Research) had stated in Abstracts with regard to previous GM authorisations that there were no effects on human or animal health or the environment. However, in the main body of the document, the Panel had admitted to the *“problems of reduction in farmland biodiversity, selection of weed communities and selection of herbicide resistant weeds and destruction of food webs and the ecological functions they provide.”* Nevertheless, each time EFSA has approved the relevant GM, but covers itself by saying: *“The magnitude of these potential adverse environmental effects will depend on a series of factors including the specific herbicide and cultivation management applied at farm level, the crop rotation...etc. and recommends “case-specific monitoring”.*

Why are the Chairs of the EFSA Panel on Genetically Modified Organisms (GMO) and genetically modified food and feed,¹³¹ the Scientific Committee and Emerging Risks (SCER)¹³² and Contaminants in the Food Chain (CONTAM)¹³³ all British?

Was it part of the plan with industry on 26/06/2012 to facilitate getting GM crops into Britain?

Professor Joe Perry, Chairman GMO Panel formerly worked at Rothamsted Research.

Professor Anthony Richard Hardy, Chairman of SCER, formerly worked for the Central Science Laboratory in York and ADAS.

Dr Diane Benford, Chairman of CONTAM, currently works for the UK Food Standards Agency.

Prof Huw Jones is another member from Rothamsted Research on the GMO Panel.

Chemicals Regulation Directorate and Defra Minister reject evidence about pesticides

In response to an enquiry from Lord Hylton on behalf of our campaign, Lord de Mauley, the Defra Minister and CRD (31/08/2013) (at his request) sent a copy of their 9-page reply to me:

Systemic Neonicotinoid insecticides: *“Dr Mason raises a number of points about the effects and properties of chemicals used for termite control. Termites are not a UK pest problem, but the points she raised are addressed through the explanation of various aspects of the EU regulatory system below.”* I had argued that Bayer uses the action of neonicotinoid suppression of the immune system to kill colonial insects such as termites (Premise 200SC)¹³⁴ and ants (Baythion I Myrelokkedaase Denmark). Therefore it is likely that honeybees will be similarly affected.

“Premise 200SC plus Nature causes termites to succumb to disease and death by naturally occurring organisms”... “Imidacloprid binds to nicotinic acetylcholine receptors at the nervous system...they stop feeding, grooming and become disorientated”...“Low doses of Premise 200SC such as the edge of the Treated Zone, disorientate the termites and cause them to cease their natural grooming behaviour. Grooming is important for termites to protect them against pathogenic soil fungi. When termites stop grooming, the naturally occurring fungi in the soil attack and kill the termites. Premise 200 SC makes fungi 10,000 times more dangerous to termites. Nature assists Premise in giving unsurpassed control. This control is Premise 200SC plus Nature.”

Honey bees groom each other. Buzz about Bees website states: *A natural defence against Varroa mites for bees is grooming. Bees also groom in defence against diseases and fungi.*¹³⁵

Sir John Beddington and Defra had rejected our hypothesis in 2011 about systemic neonicotinoids being at the root of global wildlife declines; but when I informed them that our paper had been published in a peer-reviewed journal¹³⁶ they failed to reply.

Glyphosate: *“The review paper by Samsel and Seneff¹³⁷ referred to by Dr Mason suggests possible links between exposure to glyphosate and a wide range of human diseases. CRD notes that many of*

¹³¹ <http://www.efsa.europa.eu/en/gmo/gmomembers.htm>

¹³² <http://www.efsa.europa.eu/en/scer/scmembers.htm>

¹³³ <http://www.efsa.europa.eu/en/contam/contammembers.htm>

¹³⁴ http://www.elitepest.com.sg/brochure/Premise_200SC.pdf

¹³⁵ <http://www.buzzaboutbees.net/honey-bee-health.html>

¹³⁶ <http://www.stmconnect.com/sites/default/files/3-12%20%20JEIT-D-12-00001.pdf>

¹³⁷ <http://www.mdpi.com/1099-4300/15/4/1416>

the proposed associations between glyphosate and human disease seem hypothetical rather than being based on convincing evidence to support cause and effect."

Nevertheless the CRD agreed to submit this paper to Germany, the Rapporteur Member State for glyphosate for its review of the chemical; however, it failed to be considered.

The systemic neonicotinoid insecticides; a disaster in the making

On December 3rd 2010, we sent the CRD and Defra information about (and later a pdf link to) Dr Henk Tennekes' book. Dr Tennekes, an independent Dutch toxicologist, first warned of the dangers of the systemic neonicotinoid insecticides to arthropods in a paper in *Toxicology*¹³⁸ and in his book: *The systemic neonicotinoid insecticides: A disaster in the making*.¹³⁹ Dr Tennekes says that his book: *"catalogues a tragedy of monumental proportions regarding the loss of invertebrates and subsequent losses of the insect-feeding (invertebrate-dependent) bird populations in all environments in the Netherlands. The disappearance can be related to agriculture in general, and to the neonicotinoid insecticide imidacloprid in particular, which is a major contaminant of Dutch surface water since 2004."* The relationship exists because of crucial (and catastrophic) disadvantages of the neonicotinoid insecticides: the damage to the central nervous system of insects is irreversible and cumulative. Tennekes showed that there is no safe level of exposure, and even minute quantities can have devastating effects in the long term. They leach into groundwater and contaminate surface water and persist in soil and water, chronically exposing aquatic and terrestrial organisms to these insecticides. *"So, what, in effect, is happening is that these insecticides are creating a toxic landscape, in which many beneficial organisms are killed off."* Tennekes and Sánchez-Bayo, in a more recent paper, demonstrated that chemicals that bind irreversibly to specific receptors (neonicotinoids, genotoxic carcinogens and some metalloids) will produce toxic effects in a time-dependent manner, no matter how low the level of exposure.¹⁴⁰

Imidacloprid was licensed for use in Europe in 1994 and in July 1994, beekeepers in France noticed something unexpected. Over the course of a few days, just after the sunflowers had bloomed, a substantial number of their hives would collapse, as the worker bees flew off and never returned, leaving the queen and immature workers to die. The French beekeepers soon believed they knew the reason; a brand-new insecticide called Gaucho® with imidacloprid as active ingredient was being applied to sunflowers.¹⁴¹ In 2003, and new longer acting insecticide, clothianidin, was given conditional registration by the US EPA¹⁴² but, 10 years on, field trials for its effects on honey bees were still lacking. It is also extremely persistent in the soil.¹⁴³ The half-life in soil of clothianidin ranged from 13-1386 days. In a later trial it was still in the soil at 19 years, but the US EPA decided to discount that figure.

Background on systemic neonicotinoid insecticides: The Society of Environmental Toxicology and Chemistry (SETAC) is controlled by industry and the US EPA

Dr Peter Campbell of Syngenta (UK) is currently the World President of SETAC, a Society that is controlled by industry and the US EPA. In 2011, SETAC held a Workshop on Pesticide Risk Assessment for Pollinators January 15-21, 2011, at Pellston, Florida. It was by invitation only; 'world experts' of whom many were from industry (Helen Thompson, now working for Syngenta, and Mark

¹³⁸ Tennekes HA. The significance of the Druckrey-Küpfmüller equation for risk assessment – The toxicity of neonicotinoid insecticides to arthropods is reinforced by exposure time. *Toxicology* 2010; 276(1):1-4.

<http://www.ncbi.nlm.nih.gov/pubmed/20803795>

¹³⁹ Tennekes HA *The systemic insecticides: a disaster in the making* 2010

¹⁴⁰ <http://www.omicsonline.org/time-dependent-toxicity-of-neonicotinoids-and-other-toxicants-implications-for-a-new-approach-to-risk-assessment-2161-0525.S4-001.php?aid=2840>

¹⁴¹ <http://www.stmconnect.com/sites/default/files/3-12%20%20JEIT-D-12-00001.pdf>

¹⁴² <http://www.epa.gov/opprd001/factsheets/clothianidin.pdf>

¹⁴³ Footprint Database: International Union of Pure and Applied Chemistry (IUPAC)
<http://sitem.herts.ac.uk/aeru/iupac/>

Clook CRD were present from the UK). David Fischer from Bayer CropScience and Thomas Moriarty from the US EPA Office of Pesticide Programs and Team Leader, US EPA Bee Unit wrote the Executive Summary.¹⁴⁴ Thomas Moriarty intercepted my email to the vanishing Joseph DeCant Ecologist US EPA (see below).

The Executive Summary shows that the pesticides industry and all of the environmental protection agencies were aware of the following, which up until then, they had consistently denied:

- That the systemic neonicotinoid pesticides are harmful to bees.
- That the tests and protocols that had allowed registration of the systemic pesticides were not adapted to assess potential hazard and risk from this type of pesticide.
- Despite knowing all this, the Protection Agencies had allowed the pesticides industry to keep neonicotinoids on the market while they carried out further research.
- That many of the projects suggested for the future have already been done by independent scientists. These were merely delaying tactics.

Admission on Page 12 *“Many who are familiar with pesticide risk assessment recognize that the methodology and testing scheme for foliar application products (where exposure may be primarily through surface contact) is not adapted to assess potential hazard and risk from systemic pesticides”.*

Conditional¹⁴⁵ registration of clothianidin in the US

On May 30, 2003, Daniel C Kenny of the US EPA Registration Division granted **conditional** registration for clothianidin to be used for seed treatment on corn and canola (oil seed rape) to Bayer Corporation.¹⁴⁶ In the 19-page document, the EPA scientists (as opposed to the Registration Division) had assessed the risks as: *“Clothianidin is highly toxic to honey bees on an acute contact basis. It has the potential for toxic chronic exposure to honey bees, as well as other non-target pollinators, through the translocation of clothianidin residues in nectar and pollen. In honey bees, the effects of this toxic chronic exposure may include lethal and/or sub-lethal effects in the larvae and reproductive effects in the queen. The fate and disposition of clothianidin in the environment suggest a compound that is a systemic insecticide that is persistent and mobile, stable to hydrolysis, and has potential to leach into ground water, as well as run-off to surface waters. There is evidence of effects on the rat immune system and juvenile rats appear to be more susceptible to these effects.”* Summary of Data Gaps. Page 18. There were gaps in Toxicology; Residue Chemistry; Environmental Fate Data and Ecological Effects Data. These included: Additional studies on *Developmental Immunotoxicity and Mutagenicity. Data on aerobic aquatic metabolism and a Seed leaching study. Whole sediment acute toxicity to freshwater invertebrates. Field test for pollinators.* There is no evidence that the data gaps were filled in.

A leaked document from the US Environmental Protection Agency (EPA) Environmental Risk Branch provided independent confirmation of the devastating effects on biodiversity that Dr Tennekes had described with imidacloprid, but with another neonicotinoid, Clothianidin.¹⁴⁷

To: Kable Davis, Risk Manager Reviewer, Venus Eagle, Risk Manager, Meredith Laws, Branch Chief, Insecticide-Rodenticide Branch Registration. November 2nd 2010.

Memo: *Clothianidin* Registration of Prosper T400 seed treatment on Mustard seed and Poncho/Votivo seed treatment on cotton

From: Joseph DeCant, Ecologist, Michael Barrett, Chemist, Environmental Risk Branch V,

¹⁴⁴

http://c.ymcdn.com/sites/www.setac.org/resource/resmgr/publications_and_resources/executivesummarypollinators .pdf?hhSearchTerms=SETAC+and+Pellston+and+Workshop

¹⁴⁵ 'Conditional' means that they are allowed to sell it on condition that they fulfil all the data gaps within a year

¹⁴⁶ <http://www.epa.gov/opprd001/factsheets/clothianidin.pdf>

¹⁴⁷ http://www.panna.org/sites/default/files/Memo_Nov2010_Clothianidin.pdf

Environmental Fate and Effects Division

Through: Mah T Shamim, Branch Chief, Environmental Risk Branch V

(Excerpts from the 101-page attached document, which can be read in full). Pages 1-5 is a summary sent in the form of a memo on November 2nd 2010.

The memo summarizes the Environmental Fate and Effects Division screening level Environmental Risk Assessment for clothianidin. The Registrant, Bayer CropScience is submitting a request for registration of *clothianidin* to be used as a seed treatment on cotton and mustard seed...The major risk concerns are with aquatic free-swimming and benthic invertebrates, terrestrial invertebrates, birds and mammals...Major risk concern is to non-target insects (that is honey bees). *Clothianidin* is a neonicotinoid insecticide that is both persistent and toxic. Acute toxicity studies to honey bees show that *clothianidin* is highly toxic on both a contact and an oral basis... Information from standard tests and field studies, as well as other incident reports involving other neonicotinoids, suggests the potential toxic risk to honey bees and other beneficial insects. An incident in Germany already illustrated the toxicity of *clothianidin* when allowed to drift off site from treated seed during planting... Poses an acute and chronic risk to small birds and mammals when *clothianidin* treated seeds are applied with no incorporation method... Acute risk to freshwater invertebrates: Acute lethal toxicity to benthic invertebrates also suggests this conclusion. These organisms are an integral part of the freshwater trophic systems and serve as both decomposers/predators that are important for nutrient cycles and a food source for larger predators (e.g. fish). The ecological integrity in these vulnerable areas in the US could therefore be impacted on by the use on cotton at the proposed application rates. The potential for *clothianidin* to move from the treated area to the nearby surface water body has been increased significantly since 2003 because the registrant has recently added new uses to the labels. The compound is toxic to honey bees... The persistence of residues and potential residual toxicity of *clothianidin* in nectar and pollen suggests the possibility of chronic toxic risk to honey bee larvae and the eventual instability of the hive... *clothianidin* has the properties of a chemical which could lead to widespread groundwater contamination, but no groundwater studies have been conducted to date...extreme mobility and persistence of *clothianidin* in the environment.

The original study in 11/02/10, was prepared by Drs Joseph DeCant and Michael Barrett and approved by Mah T Shamim, the Chief of the Environmental Branch V. Pages 6-75

P 60 Insects, acute contact and oral: *"The submission of honey bee acute oral toxicity studies is not a guideline requirement. The Office of Pesticides Programs (OPPs) does not have a categorization scheme for acute oral toxicity to honey bees. However, based on the ICBB (1985) acute oral toxicity categorization scheme, clothianidin would be considered highly toxic to the honey bee by the oral route"*

P 62 Insects, Field Testing for Pollinators: *"Six honey bee field studies were undertaken in various locations (Sweden, United Kingdom, France, Canada, United States, and Germany)".*

"These studies were considered scientifically sound; however, they do not fulfil the requirements for a pollinator field test (OPPs Guideline 141-5) because the protocol was not approved by EPA. They are classed as supplemental. An approved protocol would have required that the studies be conducted in the United States, longer duration of honey bee activity observations, and the use of replications in the treatments and controls for statistical analysis. Field exposure to the test substance and the bee observation period were too brief (<30 days) to fully evaluate the impact the exposure levels of clothianidin would have had on the bee colonies tested. The complete life cycle for an individual worker bee during the time period tested would be approximately 63 days,"

The Dutch study (Dr Henk Tennekes) and the US EPA studies complemented each other

These two studies were done completely independently in Holland and in the US. The researchers, one a toxicologist, the other two, an ecologist and a scientist, came to almost identical conclusions on the potentially lethal properties of two different neonicotinoids. In fact Dr Tennekes' work provided what the two US researchers needed; a study that actually measured the extent of

neonicotinoid contamination of a body of water. Surprisingly, neither of them was aware of the others' work, until this US EPA document, leaked to a Colorado bee keeper, came to the attention of bee groups in the UK. The fact that the US EPA gave Clothianidin registration for this new use is not a surprise. According to Michael Schacker, author of *A Spring without Bees: How Colony Collapse Disorder Has Endangered Our Food Supply* published in 2008, during the Bush era pesticide regulations were loosened, resulting in a dramatic increase in the amount of pesticides sprayed on the nations' food. Dr Tennekes emailed Joseph De Kant, but he had vanished from his desk.

Healthy Harvest-safeguarding the Crop Protection tool box: June 2014

The National Farmers' Union (NFU), the Crop Protection Association (CPA) and Agricultural Industries Confederation (AIC) launched *Healthy Harvest – safeguarding the crop protection toolbox* in June 2014. The NFU and pesticide companies continually defend the use of pesticides for economic reasons and complain at any attempt to restrict the 320 at their disposal. One farmer defended aerial spraying of bracken with a herbicide.¹⁴⁸ CPA, AIC and the NFU commissioned Andersons to write a Report: The effect of the loss of plant protection products (i.e. pesticides) on UK Agriculture and Horticulture that predicted dire economic effects on UK farming if pesticides were restricted.¹⁴⁹

The Soil Association's campaign against Glyphosate residues in our bread

On finding that there are glyphosate residues in our bread and the WHO International Agency for Research into Cancer has declared that glyphosate is probably carcinogenic to humans, the Soil Association has launched a campaign NOT IN OUR BREAD.¹⁵⁰ A Report by Pesticides Action Network-UK has shown that 46% of non-organic food in 2013 contained residues of one or more pesticides and this had increased from 25% in 2003.¹⁵¹ A further Report by PAN-UK: Pesticides in your daily bread showed that nearly two-thirds of bread contained one or more pesticides and the three most frequently found were glyphosate, chlormequat and malathion.¹⁵²

This is all the more concerning because UK farmers have been spraying glyphosate pre-harvest since 1980¹⁵³ at the suggestion of a scientist from Monsanto.¹⁵⁴

Farmers use more carcinogenic weed killer: The Times August 15 2015¹⁵⁵

"Farmers have sharply increased their use of a weed killer that has been classified as 'probably carcinogenic in humans.'" Ben Webster, The Times Environment Correspondent said. "More than 1,700 tonnes of glyphosate were sprayed on crops last year, up a third on 2012, according to the Department for Environment, Food and Rural Affairs (Defra). The total area sprayed with the weed killer grew by almost 500,000 hectares to 2.1 million hectares, an area the size of Wales." Guy Gagen, chief arable adviser for the National Farmers' Union, said that glyphosate usage had probably increased to control black-grass,¹⁵⁶ a weed that is resistant to weaker herbicides. He said: *"No farmer would be wanting to put a chemical on a crop when he doesn't need to."* He added that spraying wheat could result in traces of glyphosate ending up in bread sold in supermarkets but the amount was well below the maximum residue level set by the EU. A Defra spokesman said: *"There are*

¹⁴⁸ https://www.nfuonline.com/healthyharvest_final_digital/ The impact of losing plant protection products on UK Food Production

¹⁴⁹ http://www.cropprotection.org.uk/media/89364/andersons_final_report.pdf

¹⁵⁰ <http://www.soilassociation.org/notinourbread>

¹⁵¹ http://www.pan-uk.org/files/pesticides_on_a_plate_2013_final.pdf

¹⁵² [http://www.pan-uk.org/files/Pesticides%20in%20Your%20Daily%20Bread%20guide%20-%20FINAL%20\(1\).pdf](http://www.pan-uk.org/files/Pesticides%20in%20Your%20Daily%20Bread%20guide%20-%20FINAL%20(1).pdf)

¹⁵³ <http://cereals.ahdb.org.uk/media/185527/is02-pre-harvest-glyphosate-application-to-wheat-and-barley.pdf>

¹⁵⁴ O'Keeffe MG. The control of Agropyron repens and broad-leaved weeds pre-harvest of wheat and barley with the isopropylamine salt of glyphosate; 1980. pp. 53–60. Proceedings of British Crop Protection Conference-Weeds.

¹⁵⁵ <http://www.thetimes.co.uk/tto/environment/article4528297.ece>

¹⁵⁶ HERBICIDE RESISTANT BLACKGRASS, FIRST SEEN IN 1982 IS NOW FOUND ON 16,000 FARMS IN 34 COUNTIES. This is a glyphosate-resistant super weed, the same as in GM in the US and Japanese Knotweed in the UK. Does the NFU understand super weeds and do they really want GMO technology?

extensive regulations in place so that people and the environment are protected from pesticides. The approval of glyphosate for use across Europe is being reviewed by the EU Commission."

How many children's brains in Britain have been drained by chemicals?

Academic performance of 15-year-olds has deteriorated since the 1990s says Gove; the UK ratings have declined significantly in the Programme for International Student Assessment (PISA) PISA is a worldwide study by the Organisation for Economic Co-operation and Development (OECD) in member and non-member nations of 15-year-old school pupils' scholastic performance on mathematics, science, and reading.¹⁵⁷ It was first performed in 2000 and then repeated every three years. It is done with a view to improving education policies and outcomes. It measures problem solving and cognition in daily life.

The UK is falling behind global rivals in international tests taken by 15-year-olds, failing to make the top 20 in maths, reading and science (December 2013). Although not directly comparable, because there have been different numbers of countries taking part, this marks a sustained decline, with the UK having ranked 4th in the tests taken in 2000.

The UK has made little progress and remains among the average, middle-ranking countries, in 26th place for maths and 23rd for reading, broadly similar to three years ago. England's Education Secretary Michael Gove said since the 1990s, various test performances in UK schools had been "*at best stagnant, at worst declining*".¹⁵⁸

Response to my Open Letter to the NFU 22/10/2015¹⁵⁹

I wrote a 13-page Open Letter to the NFU. The above information was on page 6. On 17 November 2015 I had a reply from Meurig Raymond. Was it composed by the Agrochemical Industry?

Dear Ms Mason

The NFU firmly believes that technologies such as advanced plant breeding, biotechnology and chemical crop protection are a positive and essential part of British farming and food production. There are significant challenges inherent in providing safe, affordable and high quality food in a sustainable way in the context of growing populations, pressure on resources, volatility and a changing climate. We must therefore have all the tools in the box to source solutions to these challenges. The NFU is committed to basing its policies on the most robust scientific evidence and expertise from scientists and regulatory authorities around the world.

Meurig Raymond President

I had asked for my Open Letter to be sent to all members of the NFU. However, in a reply from Defra on 6/11/2015 Ref DWOE000388966 on the instructions of Kevin Woodhouse, the Customer Contact Unit wrote: "*We acknowledge the issues that you have raised. However it will be for the NFU to consider whether they wish to disseminate your letter.*"

OTHER WAYS IN WHICH UK MINISTERS HAVE FAILED TO ADHERE TO THE PRECAUTIONARY PRINCIPLE BUT PREFERRED TO SUPPORT CORPORATIONS AND THE ECONOMY

Mad Cow Disease 1980s-2000; how reassurances by Ministers undermined precaution

From the European Environment Agency Report 2001: The Precautionary Principle: Late lessons from Early Warnings.¹⁶⁰

¹⁵⁷ [http://www.cmec.ca/252/Programs-and-Initiatives/Assessment/Programme-for-International-Student-Assessment-\(PISA\)/PISA-2012/index.html](http://www.cmec.ca/252/Programs-and-Initiatives/Assessment/Programme-for-International-Student-Assessment-(PISA)/PISA-2012/index.html)

¹⁵⁸ <http://www.bbc.co.uk/news/education-25187997>

¹⁵⁹ https://www.academia.edu/17144792/Open_Letter_to_the_National_Farmers_Union

The first case of Bovine Spongiform Encephalopathy (BSE) in cows was officially recognised in November 1986. *"The pathological characteristics of the new cattle disease closely resembled scrapie, a transmissible spongiform encephalopathy (TSE) that is endemic in the UK sheep population...Policy-makers were repeatedly told, both by the scientific experts on whom they claimed to rely, and by the wider scientific community, that it was impossible to be certain that consuming meat, milk and dairy products from animals with BSE posed no risk.*

Ministers and senior policymakers insisted otherwise in public. On 7 June 1990, for example, the Agriculture Minister told the House of Commons that there was '... clear scientific evidence that British beef is perfectly safe' (Hansard, 1990, column 906)."

By 1995 there was evidence that BSE may cause Creutzfeldt-Jakob disease (CJD) in young people. In 1996 experiments started to see whether cattle fed on rations deliberately infected with scrapie would get BSE. The BSE crisis (1996) occurred after a new variant of CJD emerged in the United Kingdom, and consuming BSE contaminated food was considered the most probable cause.

"Most of the deceit about BSE was perpetrated by the UK government, and only a few other governments also employed deception to cloud its risks." ¹⁶¹

Mark Purdey, a farmer who died from a brain tumour aged 52, had another theory.

Obituary: ¹⁶² *"His life changed one day in 1984 when a Ministry of Agriculture (MAFF, as it then was) official told him he had to comply with a warble fly eradication order and treat his herd of Jersey cows with an organophosphate (OP) pesticide. Purdey refused, arguing that the suggested dose was far too high and in any case his natural treatment for warble fly was perfectly effective. The battle lines with the agricultural bureaucracy were drawn; before they had a chance to prosecute him, Purdey took MAFF to court and shook administrative complacency by winning his case. Purdey also noted that no home-reared cattle on fully converted organic farms had contracted BSE. He believed that the onset of the disease was associated with the over-use of chemicals on the cattle."* Samsel and Seneff, in their paper: 'Glyphosate, pathways to modern diseases III: Manganese, neurological diseases, and associated pathologies', have suggested that there may be link between glyphosate and prion diseases such as BSE. ¹⁶³

Is there a link between Mad Cow Disease, new variant CJD and agricultural chemicals?

Monsanto scientists were recommending pre-harvest glyphosate use in 1980. By 1985 ADAS (Monsanto) was promoting the use of glyphosate on grassland; they declared it to be good practice to graze the grass or preserve it as hay or silage after treatment. ¹⁶⁴ The compulsory treatment of warble fly with OP Pesticides was 1978-1981. The cattle that contracted BSE were born 1986-1988. Humans started to develop new variant CJD in 1995. It could have been a combination of chemicals.

Successive British Governments supported the pesticides industry against the public. Defra denied a link between organophosphate use as a sheep dip in the 1980s and neurological problems in farmers: OPs are still registered by Defra. Aviation Authorities and Physicians denied Pilots/Crew and Gulf War Veterans symptoms connected with OP exposure.

In 2012, Mackenzie Ross, S.J. *et al.* Reviewed 14 studies (looking at 1600 participants) and showed a relationship between low level exposure to organophosphates (OPs) and impaired neuro-behavioural functioning. OPs target memory, information processing speed, the ability to plan and

¹⁶⁰ http://www.eea.europa.eu/publications/environmental_issue_report_2001_22 Chapter 15 page 384 Patrick van Zwaneberg and Erik Millstone. 'Mad cow disease' 1980s-2000: how reassurances undermined precaution. The Precautionary Principle. Late lessons from early warnings.

¹⁶¹ Altered Genes, Twisted Truth Steven M Druker. How the Venture to Genetically Engineer Our Food Has Subverted Science, Corrupted Government and Systematically Deceived the Public. Page 385

¹⁶² <http://www.theguardian.com/news/2006/nov/21/guardianobituaries.bse>

¹⁶³ http://www.surgicalneurologyint.com/temp/SurgNeuroInt6145-4381109_121011.pdf

¹⁶⁴ Stride CD, Edwards RV, Seddon JC. Sward destruction by application of glyphosate before cutting or grazing; 1985. pp. 771-778. British Crop Protection Conference – Weeds 7B-6.

have abstract thoughts.¹⁶⁵ These findings have implications for working practice and for other occupational groups exposed to organophosphates such as Aviation Workers and Gulf War Veterans. When this paper was discussed on Radio 4 Farming Today in 2012, Defra denied a connection and said it continued to authorise the OP insecticides chlorpyrifos and dimethoate.

Chemical Concern published 23/02/2015: Incriminating sheep dip poisoning: Health & Safety Executive Report (1990) – officially destroyed –but has now been revealed¹⁶⁶

Farmer Tom Rigby, Sheep Dip Sufferers' Support Group, requested a FoI. He said: *"The information I want is HSE advice given to the government minister just before he decided to abandon compulsory dipping and the science behind and date of a government order that Ministry of Agriculture, Fisheries and Food inspectors must not go within 14ft of a sheep dip."* The HSE responded to the FoI request by telling Mr Rigby: *"The information you requested is no longer held by the Health & Safety Executive, having been destroyed in accordance with HSE's corporate retention policy"*. A 'well-wisher' sent a copy to Mr Rigby.

More than 500 farmers are affected by neurological disease, but Defra and the NHS do not recognise this as a condition.¹⁶⁷ In 2015 some MPs and Lords have asked for a public enquiry.

Tuberculosis in Cattle and Foot & Mouth Disease outbreaks; 2001 and 2007

Farmers have been spraying glyphosate pre-harvest and throughout the crop year since 1980. Some cattle and pigs are being fed with GM Roundup®-Ready Soya and Maize. Defra should send some of its scientists to Germany to learn the ELISA technique for testing for glyphosate in humans and animals. Cows and pigs with diseases should be tested for glyphosate in their urine.

USDA reports that between 20% and 40% of US dairy herds are infected with paratuberculosis alone.¹⁶⁸

Diseases related to glyphosate in animals

Glyphosate has been found in the urine of urban populations and farmers. *"In the search for the causes of serious diseases of entire herds of animals in Northern Germany especially cattle, glyphosate has repeatedly been detected in the urine, faeces, milk and feed of the animals."*¹⁶⁹

Studies in Danish Dairy cattle found:¹⁷⁰

- Glyphosate in the urine
- Blood parameter indicative of cytotoxicity (Increased alkaline phosphatase (AP), glutamate dehydrogenase (GLDH), glutamate oxaloacetate transaminase (GOT), creatinine kinase CK)
- Signs of nephrotoxicity (raised urea and creatine)
- Increased serum cholesterol
- Trace elements: very low levels of manganese and cobalt

Detection of Glyphosate in 38 malformed Piglets¹⁷¹

¹⁶⁵ <http://www.ncbi.nlm.nih.gov/pubmed/23163581>

¹⁶⁶ <https://politicalcleanup.wordpress.com/2015/02/23/secret-state-14-incriminating-sheep-dip-poisoning-hse-report-officially-destroyed-has-now-been-revealed/>

¹⁶⁷ <http://www.theguardian.com/environment/2015/apr/27/cross-party-support-from-mps-for-inquiry-into-sheep-dip-poisoning>

¹⁶⁸ <http://www.ncbi.nlm.nih.gov/pubmed/15694685>

¹⁶⁹ <http://www.ithaka-journal.net/druckversionen/e052012-herbicides-urine.pdf>

¹⁷⁰ Glyphosate in urine of cows in Denmark; metabolic changes in blood parameters including increased lipid profile marker cholesterol <http://dx.doi.org/10.4172/2161-0525.1000186> This is the first study showing the extent of the exposure to glyphosate of Danish dairy cattle and its impact on different blood parameters.

¹⁷¹ <http://omicsonline.org/open-access/detection-of-glyphosate-in-malformed-piglets-2161-0525.1000230.pdf>

Glyphosate residues were found in different organs and tissues (lungs, liver, kidney, brain, gut wall and heart) of malformed euthanized one-day-old Danish piglets (N= 38). They were tested using an enzyme-linked immunosorbent assay (ELISA).

- The highest concentrations were seen in the lungs (Range 0.4-80 µg/ml) and hearts (Range 0.15-80 µg/ml)
- The lowest concentrations were detected in muscles (4.4- 6.4 µg/g).

The authors gave an overview of reports of malformations in children of families living a few meters from where this herbicide was sprayed. The risk of malformation in human embryos is very high when their mothers are contaminated at 2 to 8 weeks of pregnancy.

Krüger *et al.* have studied the damaging effects of glyphosate on the beneficial gut biota of poultry.¹⁷² In another paper: *Visceral botulism at dairy farms in Schleswig Holstein, Germany* the authors show that the farmers who look after sick cattle with botulism often have botulism too. *C. botulinum* occurs in cows' and farmers' faeces and in cattle feeds.¹⁷³ The researchers show that the humans are most likely contracting their infections, not from the cattle but from the feeds, because the same type of botulinum is present in both humans and feeds, but the type of botulinum in the cattle is different. There is now a strong probability that glyphosate residues in animal feeds result in botulism in the cattle and also in related ailments in poultry.

In a mega dairy in Wales 160 cows died from an outbreak of botulism in May 2014. "About 20 incidents of botulism in the UK are recorded each year," the Agency added, "but because botulism is **not** a notifiable disease, this figure is unlikely to be truly representative of the disease's incidence."

Glyphosate in other species: "In the present study ¹⁷⁴ glyphosate residues were tested in urine and different organs of dairy cows as well as in urine of hares, rabbits and humans using ELISA and Gas Chromatography-Mass Spectroscopy (GC-MS). The correlation coefficients between ELISA and GC-MS were 0.96, 0.87, 0.97 and 0.96 for cattle, human, and rabbit urine and organs, respectively. Glyphosate excretion in German dairy cows was significantly lower than Danish cows. Cows kept in genetically modified free area had significantly lower glyphosate concentrations in urine than conventional husbandry cows. Also glyphosate was detected in different organs of slaughtered cows as intestine, liver, muscles, spleen and kidney. Fattening rabbits showed significantly higher glyphosate residues in urine than hares. Moreover, glyphosate was significantly higher in urine of humans with conventional feeding. Furthermore, chronically ill humans showed significantly higher glyphosate residues in urine than healthy population. The presence of glyphosate residues in both humans and animals could haul the entire population towards numerous health hazards, studying the impact of glyphosate residues on health is warranted and the global regulations for the use of glyphosate may have to be re-evaluated."

A Special Report on Deformities, Sickness and Livestock Deaths

The real cost of GM and animal feed appeared on 28/11/2013.¹⁷⁵ As well as the above pig study, several papers have demonstrated the effects of glyphosate on pathogens in farm animals: it destroys beneficial bacteria and allows harmful ones, such as *salmonella* and *clostridium*, to flourish. The action of glyphosate as a biocide on normal gut flora could be a significant predisposing factor to the increases in *Clostridium botulinum*-associated diseases¹⁷⁶ in cattle which have occurred in

¹⁷² <http://www.ncbi.nlm.nih.gov/pubmed/23224412>

¹⁷³ <http://www.ncbi.nlm.nih.gov/pubmed/22200452>

¹⁷⁴ <http://www.omicsonline.org/open-access/detection-of-glyphosate-residues-in-animals-and-humans-2161-0525.1000210.pdf>

¹⁷⁵

http://www.theecologist.org/News/news_analysis/2176082/deformities_sickness_and_livestock_deaths_the_real_cost_of_gm_animal_feed.html

¹⁷⁶ <http://www.sciencedirect.com/science/article/pii/S1075996411002344>

Germany over the last 10-15 years.¹⁷⁷ Similar effects have been shown gut bacteria in poultry¹⁷⁸ and on microorganisms in milk.¹⁷⁹



A deformed piglet; Siamese twins. Photograph by kind permission of Ib Borup Pedersen, Denmark.

Has the NFU considered that the application of glyphosate to crops and grassland or the use of GM soya feed may have predisposed herds to Mad Cow Disease, New Variant CJD and/or TB?
Have they measured glyphosate in dairy cows as has been done in Europe?

Don Huber A Senior US Plant scientist wrote to the US Secretary of Agriculture Hon Tom Vilsack, in confidence first, about a pathogen new to science

January 17th 2011: Extracts: A team of senior plant and animal scientists have recently brought to my attention the discovery of an electron microscopic pathogen that appears to significantly impact the health of plants, animals, and probably human beings. Based on a review of the data, it is widespread, very serious, and is in much higher concentrations in Roundup Ready (RR) soybeans and corn-suggesting a link with the RR gene or more likely the presence of Roundup. This organism appears NEW to science!

... We are informing the USDA of our findings at this early stage, specifically due to your pending decision regarding approval of RR alfalfa. Naturally, if either the RR gene or Roundup itself is a promoter or co-factor of this pathogen, then such approval could be a calamity. Based on the current evidence, the only reasonable action at this time would be to delay deregulation at least until sufficient data has exonerated the RR system, if it does.

...Laboratory tests have confirmed the presence of this organism in a wide variety of livestock that have experienced spontaneous abortions and infertility. Preliminary results from ongoing research have also been able to reproduce abortions in a clinical setting... It is found in high concentrations in Roundup Ready soybean meal and corn, distillers meal, fermentation feed products, pig stomach contents, and pig and cattle placentas...

...This previously unknown organism is only visible under an electron microscope (36,000X), with an approximate size range equal to a medium size virus. It is able to reproduce and appears to be a micro-fungal-like organism. If so, it would be the first such micro-fungus ever identified. There is strong evidence that this infectious agent promotes diseases of both plants and mammals, which is very rare.

¹⁷⁷ <https://www.ncbi.nlm.nih.gov/pubmed/23396248/?i=4&from=/15071029/related>

¹⁷⁸ <http://link.springer.com/article/10.1007/s00284-012-0277-2>

¹⁷⁹ <http://link.springer.com/article/10.1007/s00284-012-0098-3>

*... The organism is prolific in plants infected with two pervasive diseases that are driving down yields and farmer income—sudden death syndrome (SDS) in soy, and Goss' wilt in corn. The pathogen is also found in the fungal causative agent of SDS (*Fusarium solani* fsp *glycines*).*

...The pathogen may explain the escalating frequency of infertility and spontaneous abortions over the past few years in US cattle, dairy, swine, and horse operations. These include recent reports of infertility rates in dairy heifers of over 20%, and spontaneous abortions in cattle as high as 45%. For example, 450 of 1,000 pregnant heifers fed wheatleafe experienced spontaneous abortions... Over the same period, another 1,000 heifers from the same herd that were raised on hay had no abortions. High concentrations of the pathogen were confirmed on the wheatleafe, which likely had been under weed management using glyphosate...

For the past 40 years, I have been a scientist in the professional and military agencies that evaluate and prepare for natural and manmade biological threats, including germ warfare and disease outbreaks. Based on this experience, I believe the threat we are facing from this pathogen is unique and of a high risk status. In layman's terms, it should be treated as an emergency."

The letter was leaked to the press. Lobbyists put it about that it was 'a fake'. Dr Huber's letter of explanation (and confirmation) on 25nd March 2011 and his original letter can be seen here together with illustrations of Goss's wilt in a field of GM RR Maize, next to a green field of non-GMO maize.¹⁸⁰ It did not deter Vilsack from approving GM Roundup-Ready alfalfa. Huber's letter was sent to UK and EU officials at their request.¹⁸¹

Plant immune systems are similar to those of animals. Is that why we are plagued with diseases of trees?

Prof Jeff L Dangl of North Carolina, Chapel Hill is an expert on the plant immune systems. *"Many of these proteins (in plants) fall into a class of proteins that has related members which function in innate animal immunity...Thus activation of plant immune systems is akin to that of animal immune systems where 'modified self' can be recognised to trigger an appropriate response..."*

Salicylic acid modulates colonization of the root microbiome by specific bacterial taxa¹⁸²

Abstract: Immune systems distinguish "self" from "nonself" to maintain homeostasis and must differentially gate access to allow colonization by potentially beneficial, nonpathogenic microbes. Plant roots grow within extremely diverse soil microbial communities but assemble a taxonomically limited root-associated microbiome. We grew isogenic *Arabidopsis thaliana* mutants with altered immune systems in a wild soil and also in recolonization experiments with a synthetic bacterial community. We established that biosynthesis of, and signaling dependent on, the foliar defense phytohormone salicylic acid is required to assemble a normal root microbiome. Salicylic acid modulates colonization of the root by specific bacterial families. Thus, plant immune signaling drives selection from the available microbial communities to sculpt the root microbiome.

HISTORY OF CHEMICAL REGULATION IN EUROPE BY THE AGROCHEMICAL INDUSTRY

THE EUROPEAN FOOD SAFETY AUTHORITY (EFSA)

The procedure of risk assessment involves only one Rapporteur Member State¹⁸³

The European Food Safety Authority is responsible for issuing scientific opinions on the chemical and food safety put before the EU Commission for possible approval. EFSA bases its opinion on a risk assessment. The risk assessment procedure has several steps. For pesticides, the company wanting

¹⁸⁰ <http://www.greenpasture.org/documentFiles/5.pdf>

¹⁸¹ <http://www.cbsnews.com/news/mystery-science-more-details-on-the-strange-organism-that-could-destroy-monsanto/>

¹⁸² <http://www.sciencemag.org/content/349/6250/860.abstract>

¹⁸³ <http://www.efsa.europa.eu/en/pesticides/pesticidespeerreview.htm>

the pesticide active ingredient to be authorized assembles their dossier of studies and chooses a sympathetic member state government to submit it to.* The member state reads the dossier, which is kept secret, and reports on it, including making summaries of the studies and their findings. In the case of glyphosate, Germany is and was the Rapporteur Member State (RMS). This report by the RMS is called the Draft Assessment Report (DAR) or, in the case of an already approved active principle which is up for re-approval, the Renewal Assessment Report (RAR). The DAR includes a recommended ADI (acceptable daily intake), which is supposed to be safe for human consumption over the long term. The RAR or DAR is then sent to EFSA, which puts it out for consultation. Member states and others are invited to comment on the report. The EFSA's Panel on Plant Protection Products and their Residues reviews the industry dossier and the DAR (or RAR) and writes an opinion. The EU Commission's Health and Consumer Protection Directorate General compiles a review report. Then the member state representatives vote in committee on whether to approve, reject, or approve the pesticide active principle with restrictions. In the event that a majority vote is not achieved, the proposal passes to the European Council for a final decision.

*When glyphosate was undergoing re-assessment in Europe, the BfR Committee for Pesticides and Their Residues included two members from Bayer CropScience which manufactures SuperStrength Glyphosate for domestic use and two members from BASF which supplies the chemical isopropylamine that is used in the manufacture of glyphosate. ¹⁸⁴

Conflicts of Interest and Fraud in the Re-assessment of Glyphosate

In January 2014, the German Rapporteur Member State (RMS) submitted their draft Renewal Assessment Report (RAR) for the re-approval of glyphosate to the European Food Safety Authority (EFSA).¹⁸⁵ The RMS recommended re-approval of glyphosate for use in Europe with only minor changes; the acceptable daily intake (ADI) from 0.3 mg/kg bw/day to 0.5 mg/kg bw/day was increased. In a press release in March 2014, BfR said that glyphosate was no more poisonous than previously assumed although a critical view should be taken of certain co-formulants. This was a rather curious announcement. This was on the basis of evaluation of 150 new studies and an additional 900 studies from the scientific journals. Professor Dr Dr Andreas Hensel President of the Federal Institute of Risk Assessment (BfR) said on behalf of BfR: *These new studies do not suggest that glyphosate has carcinogenic or embryo-damaging properties or that it is toxic to reproduction in test animals. The data do not warrant any significant changes in the limit values of the active ingredient...* Prof Hensel continued: *Worldwide, glyphosate is one of the most common active ingredients in pesticides used to prevent unwanted plant growth in plant cultivation or to accelerate the ripening process of crops (desiccation). Glyphosate inhibits an enzyme which is essential for the biosynthesis of certain amino acids. This enzyme is not found in animals and humans.*¹⁸⁶ Several competent authorities in Germany are involved in the writing process (*i.e.*, the Federal Institute for Risk Assessment -BfR-, the Federal Environment Agency, the Julius Kuehn-Institute and the Federal Office of Consumer Protection and Food Safety) so presumably they all believe this to be so.

The statement by BfR is incorrect: glyphosate poisons humans in the same way as it poisons plants

- Humans and animals have exactly the same pathway as in plants; mammals can only absorb nutrition via the bacteria in their gut; the gut microbiome. **The gut microbiome is the collective genome of organisms inhabiting our body.** Glyphosate residues in food disrupt the pathway which involves 5-enolpyruvylshikimate-3-phosphate synthase. Beneficial bacteria are destroyed, causing inflammatory changes in the gut lining, destroying its absorptive capacity in humans and animals, chelating (extracting or grabbing) minerals,

¹⁸⁴ http://www.bfr.bund.de/en/members_of_bfr_committee_for_pesticides_and_their_residues-189322.html

¹⁸⁵ http://www.bfr.bund.de/en/the_bfr_has_finalised_its_draft_report_for_the_re_evaluation_of_glyphosate-188632.html

¹⁸⁶ http://www.bfr.bund.de/en/press_information/2014/03/glyphosate_no_more_poisonous_than_previously_assumed_although_a_critical_view_should_be_taken_of_certain_co_formulants-188898.html

depleting micronutrients and interfering with multiple metabolic processes resulting in obesity, type 2 diabetes, autism, dementia, cancers, inflammatory bowel diseases (Ulcerative Colitis and Crohn's disease), celiac disease, hypercholesterolaemia and many other disorders associated with those on a Western diet.¹⁸⁷ Chatelier, E.L. *et al.* Richness of human gut microbiome correlates with metabolic markers *Nature* 29 August 2013; 500: 541-550.¹⁸⁸ *"We are facing a global metabolic health crisis provoked by an obesity epidemic."* In a multi-author study of obese and non-obese individuals, those with *"low bacterial richness in the gut (23% of the population) are characterized by more marked overall adiposity, insulin resistance and dyslipidaemia and a more pronounced inflammatory phenotype when compared with those with high bacterial richness...Low richness of gut microbiota has been reported in patients with inflammatory bowel disorder...Also notable diversity differences were observed between the urban US population and rural populations from two developing countries"*. Current research is underway to try to find the links between obesity, type 2 diabetes and cancers. Diet rapidly and reproducibly alters the human gut microbiome¹⁸⁹ *"Long-term dietary intake influences the structure and activity of the trillions of microorganisms residing in the human gut" ... In concert, these results demonstrate that the gut microbiome can rapidly respond to altered diet, potentially facilitating the diversity of human dietary lifestyles.*

The BfR legal department claims that the reassessment was solely done by BfR staff members

On 15/07/2014 Herr König, on behalf of the BfR Justizariat (Legal Department), wrote to Dr Nancy Swanson with regard to her request for information (06/04/2014) about the Renewal Assessment Report (RAR) on glyphosate. Herr König said that the work on the RAR on glyphosate was *"solely done by the BfR staff members of department no. 6, who are civil servant employees."*

This was not what independent scientists from the Institute of Science in Society discovered

This seems to contradict the findings of Dr Nancy Swanson and Dr Mae Wan Ho of the Institute of Science in Society (I-SIS) after detailed examination of the 15-volume, 3,744 page RAR.¹⁹⁰

"But BfR and its federal agency partners did not actually review the published toxicology studies. Instead they relied on a summary provided to them by the Glyphosate Task Force (GTF). "Due to the large number of submitted toxicological studies, the RMS was not able to report the original studies in detail and an alternative approach was taken instead." The study descriptions and assessments as provided by the GTF were amended by deletion of redundant parts (such as the so-called "executive summaries") and new enumeration of tables. Obvious errors were corrected. Each new study was commented by the RMS. These remarks are clearly distinguished from the original submission by a caption, are always written in italics and may be found on the bottom of the individual study summaries" [RAR, Vol. 3 Annex B.6.1., p. 5]. So, the RMS did not actually evaluate the toxicology reports published in the open literature, they simply put the GTF assessment in their report in its entirety (except for the redundant and erroneous parts).

*And the GTF consists of Monsanto and a consortium of chemical companies all over Europe, including Syngenta UK and Dow Italy, with an odd one from Taiwan thrown in for good measure (see pp. 9-13 of Vol. 1 of the RAR). Although the BfR added comments here and there, all the assessments of the toxicological studies were from the GTF. **Hence Monsanto and other companies who stood to gain from selling glyphosate herbicides were given free rein to pronounce glyphosate effectively even safer than before, hence the increase in ADI...***

Consequently, the rapporteur member state (RMS) has accepted, without question, virtually all of the unpublished reports given to them by the chemical companies. Much of the information is blacked

¹⁸⁷ <http://www.mdpi.com/1099-4300/15/4/1416>

¹⁸⁸ <http://www.nature.com/nature/journal/v500/n7464/abs/nature12506.html>

¹⁸⁹ <http://www.nature.com/nature/journal/vaop/ncurrent/full/nature12820.html>

¹⁹⁰ http://www.i-sis.org.uk/Scandal_of_Glyphosate_Reassessment_in_Europe.php

out (author, report title, laboratory) but the sponsoring company is named (Monsanto, Syngenta etc.) and the reports are referred to by a number...

Conclusion: *The entire process of risk assessment for re-approval was flawed and corrupt to the core. It is rife with conflict of interest, non-transparent and heavily biased towards unpublished, non-peer reviewed studies from industry. The RAR is worse than useless, and should be rejected outright. All available evidence including studies on commercial formulations of glyphosate herbicides should be seriously considered in any risk assessment, and by a truly independent, unbiased panel free from any conflict of interest.*

Report by German authorities on the most commonly used herbicide criticised as inadequate: 10 October 2014. Testbiotech, another independent organization, highlighted renewed concern over the risk assessment of glyphosate.¹⁹¹

"...Testbiotech is highlighting the ongoing inadequacies in the risk assessment of the herbicide, glyphosate. The weed killer is sold under brand names such as Roundup. At the beginning of this year, German authorities published a Renewal Assessment Report (RAR) as part of an EU re-evaluation process for the most widely used weed killer. According to the German authorities, there were no risks to health, and it was even suggested that the acceptable daily thresholds for long-term exposure (ADI) to which consumers could be exposed might be raised."

In contrast to these findings, the Testbiotech analysis shows that the German assessment report is untenable in light of new scientific evidence and cites evidence from studies published in 2013 and 2014. Testbiotech concluded that risks associated with glyphosate must be examined much more closely than has been the case so far.

Glyphosate Task Force (GTF)

The European Glyphosate Task Force (GTF) is a consortium of 24 companies joining resources and efforts in order to renew the European glyphosate registration with a joint submission.¹⁹² The GTF announced that EFSA had completed the assessment¹⁹³ and there was a link to ask key questions.¹⁹⁴ A member of the Monsanto staff in Cambridgeshire UK is responsible for the website. Glyphosate.eu is an organisation publishing *Glyphosate Facts* (for the benefit of European farmers)¹⁹⁵ and *Transparency on safety aspects and use of glyphosate containing herbicides in Europe*. The information and fact sheets for download are provided by the Glyphosate Task Force. The information about how glyphosate works states:¹⁹⁶ *"Plants absorb glyphosate through their leaves and other green parts. From here, the glyphosate moves to the growing points of shoots and roots, where it interferes with the enzymatic production of certain amino acids that are essential for plant growth. This pathway exists only in plants, fungi and bacteria, so the toxicity to animals is low."* This statement is false (see above). There is also a link to *Pre-harvest use of glyphosate and residues in food*.¹⁹⁷ *"Acceptable Daily Intake (ADI) values are the daily doses that if ingested daily over a lifetime are judged to be without appreciable health risk to consumers. The ADI established by the European Commission for glyphosate is 0.3 mg/kg bw/day... MRLs are legal standards established for international trade purposes."*

Why did Monsanto ask EFSA to increase the Maximum Residue Limits in lentils 100-fold?¹⁹⁸

¹⁹¹ <https://www.testbiotech.org/en/node/1094>

https://www.testbiotech.org/sites/default/files/TBT_Comment_glyphosate_final.pdf

¹⁹² <http://www.glyphosatetaskforce.org/>

¹⁹³ <http://www.prnewswire.co.uk/news-releases/glyphosate-task-force-evaluation-report-for-the-herbicide-glyphosate-is-now-publicly-available-250318711.html>

¹⁹⁴ <http://www.glyphosate.eu/safety>

¹⁹⁵ <http://www.glyphosate.eu/>

¹⁹⁶ <http://www.glyphosate.eu/glyphosate-basics/how-glyphosate-works>

¹⁹⁷ http://www.glyphosate.eu/system/files/sidebar-files/pre-harvest_use_of_glyphosate_residues_in_food.pdf

¹⁹⁸ <http://www.efsa.europa.eu/en/search/doc/2550.pdf>

What else does the European Glyphosate Task Force do?

It played a significant part in persuading the Sri Lankan government to lift its ban on glyphosate.¹⁹⁹ This was what the Colombo Times wrote in May 2013.

A European Glyphosate Task Force also has concluded that there is no true link to the kidney disease. *"The research study conducted by Dr. Channa Jayasumana of the Rajarata University (Sri Lanka)"²⁰⁰ found that while the weedicide itself is not nephrotoxic, when it combines with hard ground water containing metals such as cadmium and arsenic, either naturally present in the soil or added through fertilizer, glyphosate becomes extremely toxic to the kidney. However, since then the validity of Dr Jayasumana's research had come under question as the manufacturer Monsanto and other agrochemical producers have raised objections to the findings saying that there is no evidence to suggest the conclusion that glyphosate is responsible for Chronic Kidney Disease of unknown aetiology (CKDu)."*

"CKDu was first discovered among the rice paddy farmers in the Northern Central Province of Sri Lanka. Over the next two decades, the disease spread rapidly to the other farming areas. The prevalence of the diseases is estimated at 15% affecting a total of 400,000 patients with a death toll of around 20,000."²⁰¹

After the German BfR draft risk assessment was published, scientists from the BfR dismissed studies of glyphosate in human urine as unlikely to be of public health concern

The BfR wrote a paper: "A critical review of glyphosate findings in human urine samples and comparison with the exposure of operators and consumers"? (Accepted: 03/11/2014, published online: 08/01/2015)²⁰² In it they dismissed the study by Moms Across America and Sustainable Pulse in which they found glyphosate in breast milk²⁰³ and concluded with this statement: *"Thus, the results of this review of urine analysis data confirm the conclusion drawn during re-assessment of glyphosate (EFSA 2014) that the dietary intake as well as occupational exposure is unlikely to present a public health concern."*

In March 2015, the World Health Organisation's International Agency for Research on Cancer (IARC) declared glyphosate as a 2A carcinogen (probably carcinogenic in humans)

The IARC reached its decision based on the view of 17 experts from 11 countries, who met in Lyon, France, to assess the carcinogenicity of five organophosphate pesticides.²⁰⁴

"In male CD-1 mice, glyphosate induced a positive trend in the incidence of a rare tumour, renal tubule carcinoma. A second study reported a positive trend for haemangiosarcoma in male mice. Glyphosate increased pancreatic islet-cell adenoma in male rats in two studies. A glyphosate formulation promoted skin tumours in an initiation-promotion study in mice. Glyphosate has been detected in the blood and urine of agricultural workers, indicating absorption. Soil microbes degrade glyphosate to aminomethylphosphoric acid (AMPA). Blood AMPA detection after poisonings suggests intestinal microbial metabolism in humans. Glyphosate and glyphosate formulations induced DNA and chromosomal damage in mammals, and in human and animal cells in vitro. One study reported increases in blood markers of chromosomal damage (micronuclei) in residents of several communities after spraying of glyphosate formulations. Bacterial mutagenesis tests were negative. Glyphosate, glyphosate formulations, and AMPA induced oxidative stress in rodents and in vitro. The Working Group classified glyphosate as "probably carcinogenic to humans" (Group 2A)."

This was the first influential institute that had taken into account independent science.

¹⁹⁹ http://www.colombopage.com/archive_14A/May13_1399920230CH.php

²⁰⁰ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3945589/>

²⁰¹ http://www.i-sis.org.uk/Sri_Lanka_partially_bans_glyphosate.php

²⁰² <http://link.springer.com/article/10.1007%2Fs00003-014-0927-3>

²⁰³ http://www.momsacrossamerica.com/glyphosate_testing_results

²⁰⁴ [http://www.thelancet.com/pdfs/journals/lanonc/PIIS1470-2045\(15\)70134-8.pdf](http://www.thelancet.com/pdfs/journals/lanonc/PIIS1470-2045(15)70134-8.pdf) Carcinogenicity of tetrachlorvinphos, parathion, malathion, diazinon, and glyphosate.

However, in Monograph Volume 112 20/03/2015,²⁰⁵ IARC states that it has no legal power to ban glyphosate. *“The Monographs Programme provides scientific evaluations based on a comprehensive review of the scientific literature, but it remains the responsibility of individual governments and other international organizations to recommend regulations, legislation, or public health intervention.”*

Glyphosate Task Force Statement 26 May 2015

*“Evaluations carried out by regulatory authorities across the world for over forty years have all confirmed that glyphosate poses no unacceptable risk to humans, animals or the environment. The Glyphosate Task Force (GTF) therefore does not accept the recent classification of glyphosate by the International Agency for Research on Cancer (IARC) as a Group 2A carcinogen. The evaluation that has produced this outcome demonstrates serious deficiencies in terms of methodological approach and the overall conclusion is inconsistent with the results of all regulatory reviews concerning glyphosate’s safety profile.”*²⁰⁶

Pesticides Action Network Germany: Does glyphosate cause cancer?²⁰⁷

April 2015 The toxicologist Dr. Peter Clausing, who assessed the studies available on behalf of PAN Germany, said: *“The BfR only took two studies on oxidative stress into account and these were not in relation to carcinogenesis. However, between 2005 and 2013, there were at least eight further publications reporting that glyphosate can act as oxidative stressor in vertebrates such as fish, amphibians, mice and rats. None of these studies were mentioned even though such effects are very relevant in the assessment of possible carcinogenic effects of glyphosate.”* Oxidative stress occurs if highly reactive chemicals overwhelm the capacity of cells to deactivate them, and may as a result be a possible cause of cancer... In a communication released on 1 April 2015, the BfR announced that the final version of its glyphosate evaluation report had been handed over to the European Food Safety Authority (EFSA). According to this communication, the BfR did not endorse the findings of the IARC, and will ultimately leave this up to the discussion between the relevant international institutions...

On 7 April 2015, European NGOs sent a joint letter to the responsible EU Commissioner, Vytenis Andriukaitis, pointing out the gap concerning “oxidative stress” in the BfR evaluation. Now, in a joint letter, PAN Germany and Testbiotech have asked the BfR for an explanation of this omission.

The BfR received the WHO IARC paper on glyphosate and cancer after they had finalized the approval: EU approval assesses pure active glyphosate not commercially-available glyphosate²⁰⁸

BfR Communication No: 024/2015 30 July 2015, BfR reviews the IARC monograph on glyphosate.²⁰⁹

Extracts: *Many of the studies on possible carcinogenicity and genotoxicity that are currently the subject of discussion in the scientific world do not use the pure active substance glyphosate but only as part of a formulation, in other words in the form of a commercially available product together with various other components, such as co-formulants and together with other active substances.* BfR seems to imply that the IARC assessment that finds glyphosate to be carcinogenic to humans includes glyphosate which is ‘commercially available’ (**this is mostly what is used by the public in real life**) whereas the ‘EU approval procedure’ only considers the ‘pure active substance,’ obtaining

²⁰⁵ <http://www.iarc.fr/en/media-centre/iarcnews/pdf/MonographVolume112.pdf>

²⁰⁶ <http://www.glyphosate.eu/gtf-statements/statement-gtf-recent-iarc-decision-concerning-glyphosate>

²⁰⁷ <http://www.testbiotech.org/en/node/1202>

²⁰⁸

https://www.google.dk/?gws_rd=cr,ssl&ei=4nw_VZWeGoihsAG3oYCACw#q=http:%2F%2Fwww.bfr.bund.de%2Fcm%2F349%2FBfr-contribution-to-the-eu-approval-process-of-glyphosate-is-finalised.pdf

<http://www.bfr.bund.de/cm/349/bfr-contribution-to-the-eu-approval-process-of-glyphosate-is-finalised.pdf>

²⁰⁹ <http://www.bfr.bund.de/cm/349/bfr-reviews-monograph-of-the-international-agency-for-cancer-research-iarc-on-glyphosate-divergence-procedure-within-the-who-still-in-progress.pdf>

much unpublished data from industry that has often been redacted because it is considered to be 'commercially sensitive.'

BfR had previously recommended that all those involved in the assessment of glyphosate – WHO Panels, IARC, JMPR (Joint FAO/WHO meeting on Pesticides) as well as the competent EU authorities, EFSA and ECHA (European Chemical Agency) should discuss the current disputable issues before the European Commission makes a decision on the further approval of glyphosate.

The WHO/JMPR²¹⁰ was due to meet to make the final decision about the registration of glyphosate in September 2015 based on IARC's full report

Natural Resources Defense Council (NRDC) wrote to the World Health Organization (WHO) with the list of eight members of this Committee.²¹¹ They complained that three members had conflicts of interest.²¹² Angelo Moretti resigned in 2011 from EFSA after he had failed to declare conflicts of interest because he had shares in a company that helped companies needing to comply with EU Regulations.

Prof Alan Boobis is Vice-President of the Board of Directors of the International Life Sciences Institute (ILSI) Europe, Vice Chairman of the Scientific Advisory Committee of ILSI Europe and a Member of the Board of Trustees. He had served as a WHO expert on Pesticides Residues on the WHO/JMPR Committee when glyphosate was granted approval in 2002.²¹³

Dr Roland Solecki, Head of the BfR, was one of the eight experts on the WHO/JMPR even though BfR had said:²¹⁴ *In BfR's opinion it would be inexpedient if BfR as the composer of the assessment report on glyphosate would comment on the IARC monograph.*

European Commission still refuses to release documents of the German Risk Assessment²¹⁵

5 October 2015 The EU Commission informed Testbiotech that the public will still not be allowed to access documents on the risk assessment of the herbicide glyphosate...The final version of the report will be available only after EFSA has finished its own assessment and thereafter a "redacted version" will be published. *"Such subtleties certainly do not add to the credibility of the EU Commission. We have the strong impression that access to the report will be denied whatever the argument. There might be a simple reason: The EU Commission is trying to conceal major flaws in the risk assessment carried out by the German Federal Institute for Risk Assessment"*, says Christoph Then for Testbiotech.

EFSA PRONOUNCED ITS VERDICT ON GLYPHOSATE AS AN ACTIVE INGREDIENT: THEY REJECTED THE IARC REPORT²¹⁶ BUT ADMITS THAT THE GENOTOXIC EFFECTS OBSERVED IN SOME GLYPHOSATE-BASED FORMULATIONS ARE RELATED TO THE OTHER CONSTITUENTS OR "CO-FORMULANTS"

Press Release Extracts: *"The substance is unlikely to be genotoxic (i.e. damaging to DNA) or to pose a carcinogenic threat to humans. Glyphosate is not proposed to be classified as carcinogenic under the EU regulation for classification, labelling and packaging of chemical substances. In particular, all the Member State experts but one agreed that neither the epidemiological data (i.e. on humans) nor the evidence from animal studies demonstrated causality between exposure to glyphosate and the development of cancer in humans"*. EFSA explains the difference between the IARC conclusion and EFSA's conclusion on carcinogenicity: *"However, the IARC report looked at both glyphosate – an active substance – and glyphosate-based formulations, grouping all formulations regardless of their*

²¹⁰ WHO Expert Committee on Pesticide Residues held jointly with the FAO Panel of Experts on the Use of Pesticides in Agriculture

²¹¹ http://www.who.int/foodsafety/areas_work/chemical-risks/list_of_experts1.pdf?ua=1

²¹² http://docs.nrdc.org/health/files/hea_15061501a.pdf

²¹³ http://whqlibdoc.who.int/publications/2006/9241665203_eng.pdf?ua=1

²¹⁴ <http://www.bfr.bund.de/cm/349/bfr-contribution-to-the-eu-approval-process-of-glyphosate-is-finalised.pdf>

²¹⁵ <http://www.testbiotech.org/en/node/1356>

²¹⁶ <http://www.efsa.europa.eu/en/press/news/151112>

composition. *The EU assessment, on the other hand, considered only glyphosate. Member States are responsible for evaluating each plant protection product that is marketed in their territories.*"

CONCLUSIONS OF THE EUROPEAN FOOD SAFETY AUTHORITY (EFSA)

The conclusions of EFSA, following the peer review of the initial risk assessments carried out by the competent authority of the rapporteur Member State Germany, for the pesticide active substance glyphosate are reported. ²¹⁷... Following a second mandate from the European Commission to consider the findings from the International Agency for Research on Cancer (IARC) regarding the potential carcinogenicity of glyphosate or glyphosate-containing plant protection products in the on-going peer review of the active substance, EFSA concluded that glyphosate is unlikely to pose a carcinogenic hazard to humans and the evidence does not support classification with regard to its carcinogenic potential according to Regulation (EC) No 1272/2008. They claim that it does not affect human health (see **Chapter 3 Deterioration of health in the UK, the US and Latin America**) and that it has negligible effects on the environment (see **Chapter 4 Loss of biodiversity correlated to chemicals in the environment**). In particular they totally reject WHO/IARC's classification of glyphosate as carcinogenic to humans (see page 1 Monsanto's secret documents).

Thus EFSA admits that the EU only evaluates plain glyphosate; the formulated forms have a highly toxic stabiliser, a commercially secret ingredient that allows it to penetrate surfaces

Virtually all the companies have their own brand of glyphosate; Monsanto's is Roundup®. Bayer Garden has Super Strength Glyphosate.²¹⁸ Each is 'formulated' with a highly toxic stabiliser, a commercially secret ingredient, which allows it to penetrate surfaces in the manner of corrosive detergents. Four independent papers have confirmed this. In the first paper nine formulations were studied.²¹⁹ They showed that all formulations are more toxic than glyphosate alone. Among them, POE-15 appears to be the most to be the most toxic principle against human cells, even if others are not excluded. A paper in 2014 confirmed that G formulations have adjuvants working together with the active ingredient and causing toxic effects that are not seen with acid glyphosate.²²⁰ A more recent paper²²¹ showed that "Roundup® was by far the most toxic among the herbicides and insecticides tested. Most importantly, 8 formulations out of 9 were several hundred times more toxic than their active principle. Our results challenge the relevance of the Acceptable Daily Intake for pesticides because this norm is calculated from the toxicity of the active principle alone."

Glyphosate Task Force Statement 12 November 2015 about the EFSA Press Release

Richard Garnett, chair of the GTF stated that ²²²*"The EFSA conclusion completes another key milestone in the process for the re-evaluation of glyphosate by the European regulatory authorities. It confirms the previous evaluations of glyphosate by regulatory authorities around the world, which have consistently concluded that the application of glyphosate poses no unacceptable risk to human health, animals or the environment..."*

Taking account of EFSA's conclusions, the European Commission will prepare a Review Report, followed by a Regulation with a proposal that will be put to a vote by the representatives from the 28 member states at the Standing Committee on Plants, Animals, Food and Feed during the coming months."

²¹⁷ <http://www.efsa.europa.eu/de/efsajournal/pub/4302>

²¹⁸ <http://www.bayergarden.co.uk/en/data/Products/s/Super-Strength-Glyphosate.aspx>

²¹⁹ Ethoxylated adjuvants of glyphosate-based herbicides are active principles of human cell toxicity. Toxicology 2013. <http://dx.doi.org/10.1016/j.tox.2012.09.006>

²²⁰ <http://www.ncbi.nlm.nih.gov/pubmed/24434723> Glyphosate Commercial Formulation Causes Cytotoxicity, Oxidative Effects, and Apoptosis on Human Cells: Differences With its Active Ingredient. Chaufan G et al.

²²¹ <http://www.hindawi.com/journals/bmri/aip/179691/>

²²² <http://www.glyphosate.eu/news/efsa-confirms-earlier-regulatory-assessments-regarding-glyphosates-safety-profile>

In 2004 the WHO/JMPR Committee of Experts on Pesticide Residues in Food had met to evaluate the toxicology of glyphosate. The same people with conflicts of interest were present at that time Joint Meeting of the FAO Panel of Experts on Pesticide Residues in Food and the Environment and the WHO Core Assessment Group²²³

The three Members that the NRDC complained about to WHO because of conflicts of interest in 2015 had been present at the previous glyphosate re-assessment. In addition, two of the experts were from the RMS Federal Institute for Risk Assessment (BfR), Berlin, Germany and the First Draft was presented by two of the staff from BfR. There were also two members from the US EPA Office of Pesticides Programs.

Extracts from Conclusions: *"The Meeting concluded that glyphosate is unlikely to be genotoxic...In view of the absence of a carcinogenic potential in animals and the lack of genotoxicity in standard tests, the Meeting concluded that glyphosate is unlikely to pose a carcinogenic risk to humans... The Meeting concluded that the existing database on glyphosate was adequate to characterize the potential hazards to fetuses, infants, and children...On the basis of the new toxicological data, the present Joint Meeting concluded that AMPA is of no greater toxicological concern than its parent compound, thus confirming the conclusion of the 1997 JMPR..."*

A link to the European Assessment 2002²²⁴ was used by Dan Goldstein a Monsanto scientist in the US to prove that glyphosate did not bio-accumulate.²²⁵ Was the US EPA using Europe as its RMS?

A former Farm Manager (RAB) from the UK wrote a 5-page letter to the German Rapporteur Member State in May 1999. The RMS forwarded it to the Pesticides Safety Directorate in York which appeared to have been the second RMS and because it took a major part in the re-assessment.²²⁶

RAB quoted Dr Alex Proudfoot from the ACP writing about cases of severe poisoning for which the surfactant (polyoxyethyleneamine) was believed to be responsible. *"The new surfactants are expected to be less toxic than POE, but there is inadequate human experience to verify this."*

This was a member of the ACP writing.

At the end of the letter RAB said *"Glyphosate formulations imply that no harm can be done and because of this the true risk is greater (i.e. farmers don't take precautions when applying glyphosate). The danger is further enhanced with the introduction of GM crops, designed to withstand repeated application of the chemical. Such actions will have devastating effects on the environment and on the health of those using the chemical, living near areas sprayed with the chemical and those eating foods which will inevitably contain residues of this systemic organophosphate herbicide/insecticide. The dangers are obvious and I urge you to demand independent research and immediate restrictions both to its use and the importation into the EU with the aid of this systemic poison."* RAB had done experiments to show that glyphosate kills insects.

International Life Sciences Institute (ILSI) is industry-funded

The membership of ILSI Europe consists of 56 (as of 12 Feb 2015) organisations.²²⁷ This list represents Global Corporations (including the six Agrochemical Giants) with massive resources that are seeking to control the world's food supply. ILSI is an industry organisation based in Washington, DC, USA. It claims to be *"a non-profit, worldwide organization whose mission is to provide science that improves human health and well-being and safeguards the environment"* and allegedly has charity status.

Conflicts of interest at the European Food Safety Authority erode public confidence²²⁸

²²³ http://whqlibdoc.who.int/publications/2006/9241665203_eng.pdf

http://apps.who.int/iris/bitstream/10665/43624/1/9241665203_eng.pdf

²²⁴ http://ec.europa.eu/food/plant/protection/evaluation/existactive/list1_glyphosate_en.pdf

²²⁵ <https://gmoanswers.com/ask/hi-does-senior-monsanto-scientist-dan-goldstein-still-maintain-if-ingested-glyphosate-excreted>

²²⁶ <http://www.scribd.com/doc/57155451/FULLREPORT-GLYPHOSAT-04#scribd>

²²⁷ <http://www.ilsa.org/Europe/Pages/currentmembers.aspx>

²²⁸ <http://jech.bmj.com/content/67/9/717>

In 2011 Earth Open Source published an 18-page document: Europe's pesticide and food safety regulators – Who do they work for?²²⁹ *“Some prominent EFSA regulators have conflicts of interest, holding positions in organisations that are funded by the same companies whose products they are supposed to regulate. This report shows that over a period of many years, influential EFSA managers and regulators have been heavily involved with a US-based organisation called the International Life Sciences Institute (ILSI), which is funded by multinational pesticide, chemical, GM seed, and food companies.”* Angelo Moretti resigned in 2011 from EFSA after he had failed to declare conflicts of interest because he had shares in a company that helped companies needing to comply with EU Regulations. *“ILSI has also taken control of the environmental risk assessment for GM crops. It has set up a body called the Center for Environmental Risk Assessment (CERA) to “develop and apply sound science to the environmental risk assessment of agricultural biotechnologies”.* But Earth Open Source's investigation revealed much more about Moretti and many other regulators. In 2012 Corporate Europe Observatory/Earth Open Source wrote a Report: *Conflicts on the menu: A decade of industry influence at the European Food Safety Authority (EFSA).*²³⁰

The Editors of the *Journal of Epidemiology and Community Health* (owned by the British Medical Journal) read the above Report and commissioned a paper based on the information. It was published online in 2013. *Conflicts of interest at the European Food Safety Authority erode public confidence.*²³¹ This further exposed the changes in Europe that had weakened legislation and bent the rules towards industry

Extracts: *“In September 2012 Professor Gilles-Eric Séralini, a researcher at the University of Caen in France, published his team's findings that a Monsanto genetically-modified (GM) maize and Roundup herbicide caused increased rates of organ damage, tumours and mortality in rats fed over a 2-year period. The study was significant because it followed the rats over a long term period, with the first tumours only appearing after 4–7 months. In contrast, the safety studies carried out by GM seed companies in support of EU authorisations typically last for a maximum of 90 days. In other words, these studies are incapable of seeing long-term effects such as those found in Séralini's study. Europe's food safety agency, the European Food Safety Authority (EFSA), dismissed Séralini's study on the grounds of ‘inadequate design, analysis and reporting’...EFSA experts involved in assessing the risks of GM foods have attracted criticism. In 2010, 12 out of 21 experts on the GMO Panel...had conflicts of interest as defined by the Organisation for Economic Cooperation and Development (OECD.)”... “Chair of EFSA's Management Board Diána Bánáti had a longstanding relationship with the industry-funded International Life Sciences Institute (ILSI). In May 2012 she had to resign from EFSA and re-joined ILSI as Executive Director. Suzy Renkens Scientific Coordinator of EFSA's GMO Panel was criticised by the European Ombudsman over her failure to deal with conflicts of interest. She left EFSA in 2008 and stepped straight into a job with Syngenta”...*

“EFSA gives as its first and main criterion of reliability the Klimisch classification, derived from a paper by employees of the chemical company BASF. Klimisch et al. state that only tests performed according to Good Laboratory Practice (GLP) rules, the type of tests that industry performs to support regulatory authorisations, are reliable without qualification. Studies from the open literature, which generally do not use GLP, are categorised as unreliable by Klimisch et al...A factor that compromises the independence of the regulatory process is that industry tests its own products for safety. This system lies outside EFSA's control as it is laid down in EU law. Yet it encourages bias.” In fact, both Séralini's team²³² and Anthony Samsel have revealed that food being fed to laboratory animals is already contaminated by glyphosate and AMPA which invalidates all the tests done by industry.²³³

²²⁹ http://earthopenSource.org/files/pdfs/Europes-pesticide-and-food-safety-regulators/Eu_pesticidefoodsafety.pdf

²³⁰ <http://corporateeurope.org/efsa/2012/02/conflicts-menu>

²³¹ <http://jech.bmj.com/content/early/2013/03/07/jech-2012-202185.short>

²³² <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0128429>

²³³ Food for lab animals contaminated by glyphosate and AMPA.

[BREAKING: Lab Chow Contaminated by Glyphosate | Farm Wars](#)

Harry Kuiper was Chair of the GMO Panel from 2003 to 2012. He had been at the forefront of the criticism of Dr Arpad Pusztai's paper in 1998 on rats fed GM potatoes which was published in the Lancet.²³⁴ "He had been involved in the risk assessment of every GM food submitted to EFSA since the Agency was set up. Throughout his term of office he retained links with ILSI... Even the design of EFSA's GMO risk assessment standards was influenced by an ILSI Task Force headed by a Monsanto employee."

EFSA and the Séralini paper on rat tumours

I had sent a document on 22nd October 2012 to Dirk Detken, Chief Attorney for the European Food Safety Authority, Subject: EFSA and the Séralini paper on rat tumours.

"Dear Mr Detken

I have been following the argument about the science and statistics of the Séralini study (on GM Roundup Ready Maize and rat tumours) between GM industry scientists and independent ones with mounting incredulity. I am not a toxicologist or a statistician. I am a medical doctor. As Senior Attorney to EFSA, I presume that your CEO Ms Catherine Geslain-Lanuëlle must, on occasions, take your advice. Perhaps you would like to point out to her the trail of disasters to human health and the environment that has followed the planting of GM maize and Roundup Ready® crops in both Latin America and the US since they were first grown in 1996. These statistics are real, not theoretical laboratory ones. Are these the disasters that she would want to see repeated in Europe? Does she want to reject outright the Séralini study on rats and continue to insist that 90 days testing is adequate for the registration of GM crops? The first rat tumours in Séralini's study appeared in males at 4 months..."²³⁵

Republication of the Séralini study in a new journal: Science speaks for itself

Press release: GMOSeralini.org, 24 June 2014. Séralini and colleagues republished their 2 year study of GMO maize and Roundup® in rats in *Environmental Science Europe* by the Springer Group, together with its raw data.²³⁶ The team described the attacks they received in 2012 when it was first published in the *Journal of Food & Chemical Toxicology*, from those with conflicting interests, including the Science Media Centre. Reported around the world, it received minimal publicity in the UK. The Science Media Centre, a Centre to which British journalists flock when they wish to receive 'expert' advice, has sponsorship from industry including Monsanto, Syngenta and AstraZeneca. The UK and US mainstream media ignored it and BBC online dismissed it.²³⁷

This was the statement Séralini's team made in 2014: 'Roundup leads to severe hepato-renal deficiencies and sex- dependent hormone effects such as mammary tumours from very low environmental levels.' The 'sex-dependency' is confirmed by the CRUK figures for thyroid cancer²³⁸ which shows a marked increase in thyroid cancer in females compared with males; that death rates from malignant melanoma are 70 per cent higher in men than women,²³⁹ despite similar numbers being diagnosed with the disease each year; and the incidence of liver cancer in men is more than twice that in women.²⁴⁰

International Life Sciences Institute (ILSI): Is it a private club for Corporations?

Harry Kuiper left as Chairman of the GMO panel in 2012 because Corporate Europe Observatory, Christoph Then of Testbiotech, CRIIGEN and Earth Open Source had all complained about Conflicts of Interest in EFSA because of Kuiper's links with ILSI.

²³⁴ <http://download.thelancet.com/pdfs/journals/lancet/PIIS0140673605767088.pdf>

²³⁵ <http://gmandchemicalindustry9.wordpress.com/european-food-safety-authority-and-the-seralini-paper-on-rat-tumours/>

²³⁶ <http://www.enveurope.com/content/26/1/14>

²³⁷ <http://www.gmoseralini.org/republication-seralini-study-science-speaks/>

²³⁸ <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/thyroid/incidence/>

²³⁹ <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/skin/incidence/#trends>

²⁴⁰ <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/liver/incidence/#trends>

The current membership of ILSI Europe consists of 61 organisations.²⁴¹ This list represents Global Corporations (including the six Agrochemical Giants) with massive resources that are seeking to control the world's food supply. The Project Team Members consist of 18 members from around the world. Many of the individuals and organisations are names that are familiar from my 5 years of research. There are members from the US EPA and the USDA, from Dow and from the Japanese Mitsui Chemicals Agro. ILSI is an industry organisation based in Washington, DC, USA. It claims to be *"a non-profit, worldwide organization whose mission is to provide science that improves human health and well-being and safeguards the environment"* and allegedly has charity status. One of the Project Team Members, Dr Caroline Harris, is also a member of the supposedly independent UK Advisory Committee on Pesticides and Corporate Vice-President of *Exponent Inc.*²⁴² She worked for 15 years for the UK Pesticides Safety Directorate (PSD) and will have known Dr Peter Campbell Head of Ecotoxicology in the PSD. Both went through the revolving doors to high positions in Industry. Peter Campbell in 1997 became Head of Ecotoxicology in Syngenta. Dr Harris went straight into *Exponent Inc.*

Projects Team overseen by the IUPAC Subcommittee on Crop Protection Chemistry²⁴³

The two lists have nine people in common (including Dr Harris). A name on the IUPAC Subcommittee is notably absent from the Project Team. Dr Gijs Kleter from Wageningen University wrote papers with Harry Kuiper in 2002 and 2007. Since 2007 papers about GM Crops for which Kleter was the main author included co-authors Unsworth and Harris.

Current membership of the GMO panel: Has it improved since Harry Kuiper left?

Chairman: Prof Joe Perry: Registered conflicts of interest.²⁴⁴ He retired as a Rothamsted employee in June 2006. Indeed, apart from his name and email address there was little to indicate that he had been there. He seems to have 'disappeared' to become 'Rothamsted's man in Europe.' From July 2006 he has been permanently employed on various GMO Committees, until he took over from Harry Kuiper in 2012 as Chairman of the GMO panel.

Prof Perry states at the bottom of Page 2: *In terms of time, over 98% of my working time consists of advisory work as an expert on the GMO panel of EFSA, which is ongoing since 2006. For this I receive only expenses."*

In 2012 he was lead author in a paper in the Journal of Applied Ecology²⁴⁵ "Estimating the effects of Cry1F Bt-maize pollen on non-target Lepidoptera using a mathematical model of exposure."

"A 14-parameter mathematical model integrating small- and large-scale exposure was used to estimate the larval mortality of hypothetical species with a range of sensitivities, and under a range of simulated mitigation measures consisting of non-Bt maize strips of different widths placed around the field edge" Synthesis and applications. Mitigation measures of risks of Bt-maize to sensitive larvae of non-target lepidopteran species can be effective, but depend on host-plant densities which are in turn affected by weed-management regimes."

If you find this paper difficult to understand, then listen to Prof Perry explaining The Risks of GMOs to a Residential Conference of Christians in Science.²⁴⁶ At the beginning of his recorded lecture²⁴⁷ he says: *"I don't know anything about the science of GMs."* This becomes very clear as he struggles to explain it to a lay audience. If you fast forward to 20.27 min, he then tries to explain the risk to a

²⁴¹ <http://www.ils.org/Europe/Pages/currentmembers.aspx>

²⁴² Dr Caroline Harris is Corporate Vice-President of Exponent. *"Exponent, Inc., a research and scientific consultant firm with clients from industry (including crop protection) and government"*

²⁴³ http://www.iupac.org/home/about/members-and-committees/db/division-committee.html?tx_wfqbe_pi1%5bpublicid%5d=604

²⁴⁴ <http://www.efsa.europa.eu/en/gmo/gmomembers.htm>

²⁴⁵ <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2664.2011.02083.x/pdf>

²⁴⁶ <http://www.cis.org.uk/conferences/past-conferences/residential-2012/>

²⁴⁷ http://www.cis.org.uk/upload/conferences/Residential2012/Joe_Perry.mp3

non-target species of moth. He finally comes up with a recommended distance between a Bt crop and a theoretical Nature Reserve of 30 metres to mitigate the risks to a non-target unknown species of moth.

The results of mathematic modelling appear to bear no relationship to what happens in the field: US populations of a 'real' lepidopteran, the migrant Monarch Butterfly, have declined by 90%

In the last 20 years, the populations of Monarch Butterflies in the eastern US have declined by 90 percent.²⁴⁸ With the introduction of genetically-modified crops like Roundup®-Ready corn and soy that are resistant to traditional herbicides, farmers have begun to spray more and more Roundup®-- the Monsanto-made chemical-- over wider and wider areas, resulting in the loss of milkweed, the only plant upon which they lay eggs and their larvae feed.

In February 2015 the US Center for Food Safety produced an 88-page Report: *Monarchs in peril; Herbicide-Resistant Crops and the decline of Monarch Butterflies in North America*.²⁴⁹ "Unlike many other weed killers, once absorbed it (glyphosate) is translocated (moved internally) to root tissue, where it kills milkweed at the root and so prevents regeneration. The increasingly common practice of growing Roundup Ready crops continuously on the same fields means that milkweed is exposed to glyphosate every year, with no opportunity to recover. In 1999, common milkweed was found in half of corn and soybean fields, but only 8% of them a decade later." Another paper has shown that clothianidin, a long-acting systemic neonicotinoid insecticide which is widespread in US cropland contributes to the decline of Monarch Butterflies.²⁵⁰

First Vice-Chairman of the GMO Panel: Dr Gijs A. Kleter, Wageningen University. Dr Kleter is Harry Kuiper's protégé. He is a member of the IUPAC Sub-Committee on Crop Protection Chemistry and is the lead author for a number of publications for which some co-authors appear to be "dummies." It is difficult to find any scientific credentials for John Unsworth, apart from being Project Leader of the Project Team to prepare the Website for ILSI.org. Dr Caroline Harris has a 28-year history of working for industry. She has written 26 papers, eight of which are with Dr Kleter as first author. Some of the papers have 16 authors.

Second Vice-Chairman of the GMO Panel: Prof. Patrick Du Jardin: Gembloux Agro-Bio Tech; Plant Biology Unit; University of Liège; Gembloux, Belgium.

In January 2012 Prof Du Jardin was second author of a paper whose first author, Nancy Podevin an EFSA employee, found a hidden viral gene in GMO crops.²⁵¹ In fact, this paper isn't among Prof du Jardin's selected scientific publications on his Biography for EFSA. Is he anxious to avoid it being discussed? Or has he been threatened by industry? There are at least two independent scientists who have suggested that there are serious questions to be answered about human safety by those in Europe authorising GM.

Jonathan Latham, PhD, Editor of *Independent Science News* has written a Synopsis and he and Allison Wilson have published a pdf.²⁵²

Synopsis: A scientific paper published in late 2012 shows that US and EU GMO regulators have for many years been inadvertently approving transgenic events containing an unsuspected viral gene. As a result, 54 different transgenic events commercialized internationally contain a substantial segment of the multifunctional Gene VI from Cauliflower Mosaic Virus (CaMV) within them. Among these are some of the most widely grown GMOs, including Roundup® Ready Soybean (40-3-2) and MON810

²⁴⁸ <http://www.newsweek.com/monarch-butterflies-have-declined-90-conservationists-look-extra-protection-267094>

²⁴⁹ http://www.centerforfoodsafety.org/files/cfs-monarch-report-2-4-15_design_05341.pdf

²⁵⁰ <http://link.springer.com/article/10.1007/s00114-015-1270-y>

²⁵¹ Possible consequences of the overlap between the CaMV 35S promoter regions in plant transformation vectors used and the viral gene VI in transgenic plants. <http://blogg.slu.se/forskarbloggen/files/2013/02/GMcrops2012-Podevin.pdf>

²⁵² <http://www.independentsciencenews.org/commentaries/regulators-discover-a-hidden-viral-gene-in-commercial-gmo-crops/>

Maize. The oversight occurred because regulators failed to appreciate that Gene VI overlaps the commonly used CaMV 35S gene regulatory sequence.

The authors of the paper, working for the European Food Safety Authority, concluded that functions of Gene VI were potential sources of harmful consequences. They further concluded that, if expressed, the fragments of Gene VI are substantial enough for them to be functional (Podevin and du Jardin (2012) GM Crops and Food 3: 1-5).

This discovery has multiple ramifications for biotechnology. Foremost, there is the immediate question of GMO safety and whether the 54 events should be recalled, but secondly, the failure implicates regulators and the industry in a circle of mutual incompetence and complacency.

The discovery will also strengthen the argument for GMO labelling: if regulators and industry cannot protect the public then why should they not be allowed to protect themselves?

In Norway, on 24.01.2013 GenØk²⁵³ published a similar assessment at the request of the Norwegian Directorate for Nature Management.²⁵⁴

Examples of GMO Approval without considering environmental consequences

"The UK Competent Authority and Syngenta had applied for placing on the market of a GM, herbicide tolerant (glyphosate) maize GA21 for food and feed uses, import, processing and cultivation." It was adopted by the EFSA on 16 December 2011. Although the EFSA had said that there were no effects on human or animal health or the environment, in the body of the document, they admitted to the problems of reduction in farmland biodiversity, selection of weed communities and selection of glyphosate-resistant weeds, and destruction of food webs and the ecological functions they provide. Nevertheless, the EFSA approved it, but covered itself by saying "The magnitude of these potential adverse environmental effects will depend on a series of factors including the specific herbicide and cultivation management applied at farm level, the crop rotation...etc. and recommends "case-specific monitoring"

EFSA GMO Panel approved many GM crops on the grounds that they were safe for human health and the environment

This is despite the many papers that show that super weeds are massively destructive to the environment²⁵⁵ and that over a period of 30 years there has been uncontrolled spread and contamination globally by many Genetically-Engineered (GE) plants which are herbicide resistant.²⁵⁶

Uncontrolled spread of GE crops: Report on the spread of GE Oil Seed Rape²⁵⁷

GE plants have been grown for 30 years and commercially for 20 years. The Report provides a global overview of the uncontrolled escape of GE oil seed rape (OSR) in various regions of the world (US, Canada, Japan, Australia, Switzerland and Germany). In Switzerland where no imports of GE OSR have been allowed since 2008: "Transgenic OSR was able to survive along rail tracks for long periods because extensive glyphosate spraying of these areas offer them selective advantages." In Japan: "plants that proved to be resistant to glyphosate or glufosinate were found at ports and along transportation routes to industry plants where OSR is processed."

Transgene Escape: Global atlas of uncontrolled spread of genetically engineered plants²⁵⁸

²⁵³ GenØk – Centre for Biosafety is a non-commercial foundation located in the research environment at the University of Tromsø and Forskningsparken (the Science Park). GenØks vision is safer use of biotechnologies.

²⁵⁴ <http://genok.com/arkiv/723/>

²⁵⁵ <http://www.enveurope.com/content/24/1/24>

²⁵⁶ http://www.testbiotech.org/sites/default/files/Testbiotech_Transgene_Escape.pdf

²⁵⁷ www.testbiotech.de/node/891

²⁵⁸ http://www.testbiotech.org/sites/default/files/Testbiotech_Transgene_Escape.pdf

This report makes several recommendations. Most importantly, measures should be put in place immediately to stop any further uncontrolled spread of genetically engineered plants into the environment as far as possible. Comprehensive regulation should be established to strengthen the Precautionary Principle and the release of genetically engineered organisms should not be allowed if they cannot be retrieved.

A Review by EFSA GMO Panel contradicts this--- but conflicts of interest are not declared.

GMO Panel Chairman is joint author of a Review with EFSA of spread of feral GM herbicide-tolerant OSR: This Review dismisses concerns of escape of GE organisms into the environment.²⁵⁹ *“However, the scientific basis for the environmental and economic concerns posed by feral GMHT oilseed rape resulting from seed import spills is debatable.”* This review *“concludes that feral GM herbicide-tolerant oilseed rape in Europe should not be routinely managed, and certainly not in semi-natural habitats, as the benefits of such action would not outweigh the negative effects of management.”*

Conflicts of interest of Anne Glover CSO to the European Parliament (2014-2014)

Professor Glover, in an interview with EurActiv²⁶⁰ said: *“There is no substantiated case of any adverse impact on human health, animal health or environmental health, so that’s pretty robust evidence, and I would be confident in saying that there is no more risk in eating GMO food than eating conventionally farmed food.”* She said the precautionary principle no longer applies as a result. *“The evidence with which I work is independent; the evidence with which I work does not change according to political philosophy. And that should give people a lot of confidence.”* She is not independent. According to Glover's declaration, as reported by Damerval,²⁶¹ *“Professor Glover is a shareholder in a biotech company and set up the firm Remedios, which was named Scotland’s “Best New Biotechnology Company” for Biotech Scotland by its industry peers.*²⁶² *She will be a leading speaker at a conference in Africa to persuade them to grow GM crops. She sits on the board of Science Business, alongside representatives of Microsoft, Sanofi and BP; members include biotechnology companies.”*

Glover said that discomfort around the subject of GM crops in the 1980s and 1990s was *“a generation ago, we’ve moved on and the challenges are completely different.”* Corinne Lepage MEP for France (and former French Minister of the Environment) says Anne Glover is wrong.²⁶³ *“However, regarding the environmental impact of GMOs, the evidence is overwhelming and completely concrete. Not only is the dissemination of GMOs to non-GM plants proven, but the damage caused by regrowth elsewhere, which requires the use of ever more toxic pesticides, has already become a reality.”* She should also have added that in Latin America, where GMO crops have been grown since 1996, there has been an increased incidence of birth defects, miscarriages, infertility, cancers, DNA damage, neurological developmental problems in children and allergies.²⁶⁴ (In 2013 birth defects were still occurring in rural Argentina.²⁶⁵).

Corinne Lepage goes on to say: *“Glover has as such taken on a heavy amount of personal responsibility, going so far as to say the precautionary principle is no longer applicable. If in the coming years, evidence on the toxicity of GMOs comes to light, European citizens would be entitled to ask her for an explanation.”*

The Innovation Principle should replace the Precautionary Principle

²⁵⁹ <http://nora.nerc.ac.uk/15307/1/N015307PP.pdf>

²⁶⁰ <http://www.euractiv.com/innovation-enterprise/commission-science-supremo-endor-news-514072>

²⁶¹ Francois Damerval is Chief of Staff to Corinne Lepage, the French MEP.

²⁶² <http://foodvitalpublicservice.wordpress.com/2014/02/13/the-biotech-industry-retreats-from-europe-but-is-courting-africa/>

²⁶³ <http://www.euractiv.com/cap/gmos-anne-glover-wrong-analysis-514185>

²⁶⁴ <http://www.keine->

[gentechnik.de/fileadmin/files/Infodienst/Dokumente/2012_08_27_Lopez_et_al_Pesticides_South_America_Study.pdf](http://www.keine-gentechnik.de/fileadmin/files/Infodienst/Dokumente/2012_08_27_Lopez_et_al_Pesticides_South_America_Study.pdf)

²⁶⁵ <http://www.nationofchange.org/argentina-s-bad-seeds-1363532747>

The European Environment Agency had published two Reports on the Precautionary Principle: Late lessons from Early Warnings in 2001²⁶⁶ and 2013.²⁶⁷

However, many pesticide lobbyists in Europe, in common with Prof Anne Glover, are calling for the 'precautionary principle' to be abandoned and be replaced by the 'innovation principle' where risk-taking is acceptable (when it is for the benefit of businesses). Twelve of the largest corporations in Europe (the majority of which are Agrochemical Corporations) submitted an Open Letter to the President of the European Commission, Mr Jose Manuel Barroso, Mr Herman Van Rompuy, President of the European Council and Mr Martin Schulz, President of the European Parliament urging them to adopt an **"Innovation Principle"** to be taken into full consideration during policy and legislative processes in order to *"Stimulate Economic Recovery"*²⁶⁸

Commentary by Sue Davies Chairman of the EFSA Management Board following complaints about Conflicts of Interest²⁶⁹

"I therefore read with interest, the latest report from Corporate Europe Observatory on alleged conflicts of interest at EFSA (with reference to the GMO Panel). The fact that EFSA makes its experts' Declarations of Interest publicly available online allows interested parties to scrutinise for themselves how the Authority selects its scientific experts. The Management Board is confident that the policy EFSA has in place to ensure independence in its scientific work is robust. The Board is also satisfied that EFSA is implementing its own rules effectively as they apply to the selection of experts and the assessment of Declarations of Interest."

Ms. Davies had previously worked for the UK Food Safety Authority.

Wikileaks exposed information about US targeting the EU over GM crops²⁷⁰

When France made moves to ban Monsanto in 2007, US embassy cable recommends drawing up list of countries for retaliation over opposition to genetic modification.²⁷¹ Ambassador Craig Stapleton wrote on 14/12/2007: *"Country team Paris recommends that we calibrate a target retaliation list that causes some pain across the EU since this is a collective responsibility, but that also focuses in part on the worst culprits. The list should be measured rather than vicious and must be sustainable over the long term, since we should not expect an early victory. Moving to retaliation will make clear that the current path has real costs to EU interests and could help strengthen European pro-biotech voices,"* said Stapleton, who with Bush co-owned the Dallas/Fort Worth-based Texas Rangers baseball team in the 1990s. The cables show that US diplomats were working directly for GM companies such as Monsanto.

A letter had been sent to Prof Anne Glover Chief Scientific Officer to the European Commission protesting about the Draft Regulation on endocrine active chemicals 18/06/2013²⁷²

Seventy three individuals writing under the umbrella of the Royal Society of Chemistry complained that the European Commission was ignoring scientific principles in the setting of a regulatory framework for endocrine disrupting chemicals.

Protecting public health from Endocrine Disrupting Chemicals: the EDC-Free Campaign

Letter to the new EU Commissioner, President Juncker, in response to the launch of a public consultation: 20 November 2014:²⁷³

²⁶⁶ http://www.eea.europa.eu/publications/environmental_issue_report_2001_22

²⁶⁷ <http://www.eea.europa.eu/publications/late-lessons-2>

²⁶⁸ <http://www.scienceindustries.ch/file/13682/erf-communication-innovation-principle.pdf>

²⁶⁹ <http://www.efsa.europa.eu/en/press/news/131024a.htm>

²⁷⁰ <http://wikileaks.org/cable/2007/12/07PARIS4723.htm>

²⁷¹ <http://www.theguardian.com/world/2011/jan/03/wikileaks-us-eu-gm-crops/print>

²⁷² <http://www.rsc.org/suppdata/tx/c3/c3tx90013d/c3tx90013d.pdf>

²⁷³ http://www.env-health.org/IMG/pdf/letter_edc_free_coalition_to_president_juncker.pdf

We write as 19 health and environmental organisations, doctors, scientists and concerned professionals across Europe to urge you to ensure that the Commission takes clear action to minimize our multiple daily exposures to harmful hormone-disrupting chemicals. This would ensure that the EU creates lasting benefits for productivity and health budgets by reversing chronic diseases related to endocrine disrupting chemicals (EDCs).

International Society of Doctors for the Environment (ISDE)

On 14/05/2015 ISDE wrote to Martin Schultz, President of the European Parliament with a letter of appeal²⁷⁴ "To immediately and permanently ban, with no exceptions, the production, trade and use in all the EU territory, of glyphosate-based products and the four insecticides assessed by IARC".

EFSA's statement on the membership of the Scientific Committee for Emerging Risks (2015)²⁷⁵

"In view of the strategic role of the Scientific Committee, its members are prominent scientists with recognised scientific excellence, competences spreading across disciplines, seniority and prior experience with scientific bodies. The Committee's expertise encompasses all the scientific areas within EFSA's remit:

- *Human health risk assessment, food consumption and exposure assessment, environmental risk assessment, animal health risk assessment, toxicology, microbiology, human nutrition, epidemiology, animal health, animal welfare, human medicine, veterinary medicine, food hygiene, food technology, chemistry, biology, biochemistry, life sciences..."*

The Chairman is Prof Anthony Richard Hardy. He states in 2015 that he is an 'Individual Scientist' and has spent 14 years on committees. Although he says he has been working at the University of York, his email address cannot be found on the website. He was Science Director (Agri-Environment) at the Central Science laboratory (CSL) at Sand Hutton, York 1990-2009²⁷⁶ (now part of the Department for Environment, Food and Rural Affairs (Defra). The CSL is the UK's foremost public sector laboratory in the fields of agriculture, food and the environment and is an Executive Agency 'responsible for the delivery of science in support of Government objectives'. He did not state that he also worked for ADAS before that.²⁷⁷ ADAS recommended pre-harvest spraying of glyphosate (to dry them) on cereal crops in 1980. Since 1965, the MAFF Pesticides Survey Group has surveyed the use of pesticides in major agricultural and horticultural crops every 4-5 years. One of Professor Hardy's papers: *The impact of the commercial agricultural use of organophosphorus and carbamate pesticides on British wildlife*²⁷⁸ was presented at a conference in Cambridge in 1984. The lead author said: "Herbicides and fungicides are the most widely used pesticides, but, from their intrinsic toxicity, insecticides have greater potential direct effects on non-target wildlife."

The 1975-1979 quantity of herbicides used in the UK was 11,145.4 tonnes (compared with 2,336.1 tonnes of fungicides and 1,606.8 tonnes total insecticides). Prof Hardy was also Chairman of the Scientific Panel at a meeting on Endocrine Disrupting Chemicals in Parma in 2013 when the group decided that they would delay identification of EDCs.²⁷⁹ Prof Hardy has served on the Environmental Panel of the UK Advisory Committee on Pesticides for 15 years.²⁸⁰ Members are responsible for providing advice to the ACP on issues related to the environmental fate and behaviour and ecotoxicological effects of pesticides.

²⁷⁴ http://www.isde.org/Appeal_glyphosate_IARC.pdf

²⁷⁵ <http://www.efsa.europa.eu/en/scer/scmembers.htm>

²⁷⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/248290/0573.pdf

²⁷⁷ <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1038&context=vpc14>

²⁷⁸ <http://nora.nerc.ac.uk/5980/1/13.pdf> page 75.

²⁷⁹ <http://www.efsa.europa.eu/en/topics/topic/eas.htm>

²⁸⁰ http://www.pesticides.gov.uk/guidance/industries/pesticides/advisory-groups/acp/acp-environmental-panel/?wbc_purpose=ba

The Chair of the EFSA Panel on Genetically Modified Organisms (GMO) for genetically modified organisms and genetically modified food and feed,²⁸¹ the Scientific Committee and Emerging Risks (SCER)²⁸² and Contaminants in the Food Chain (CONTAM)²⁸³ are all British

Was it part of the plan with industry on 26/06/2012 to facilitate getting GM crops into Britain?

Professor Joe Perry, Chairman GMO Panel formerly worked at Rothamsted Research.

Professor Anthony Richard Hardy, Chairman of SCER, formerly worked for the CSL and ADAS.

Dr Diane Benford, Chairman of CONTAM, currently works for the UK Food Standards Agency.

Prof Huw Jones is another member from Rothamsted Research on the GMO Panel.

A letter had been sent to Prof Anne Glover Chief Scientific Adviser to the European President Barroso to protest about the Draft Regulation on endocrine active chemicals 18/06/2013²⁸⁴

Soon after Owen Paterson's comments to Syngenta about "*the UK arguing hard about a proportionate approach to regulating EDCs*" more lobbyists weighed in with delaying tactics. Seventy three individuals writing under the umbrella of the Royal Society of Chemistry complained that the European Commission was ignoring scientific principles in the setting of a regulatory framework for endocrine disrupting chemicals. A significant number of signatories had conflicts of interest. Twenty were/or had been, on EFSA Panels, Diane Benford is Chairman of EFSA CONTAMIN and she and David Gott work for the UK Food Standards Authority (FSA) and Alan Boobis served on EFSA, and is current Vice-President of ILSI Europe and a member of the Board of Trustees of ILSI.

EFSA Committee works on Endocrine Disruptors, March 2013, but continues to procrastinate

Prof Anthony Hardy Chairman of EFSA Scientific Committee and Emerging Risks made a video statement at the end.²⁸⁵ The Committee agreed unanimously with the WHO definition (2012).

"Scientific knowledge of this area is still growing and, therefore, understanding of what is an endocrine active substance continues to be the subject of scientific debate...EFSA's experts concluded that available or soon to be available internationally agreed testing methods can identify interference of chemical substances with the most important endocrine pathways in mammals and fish known to be sensitive to endocrine disruption.

EFSA concluded that a risk assessment approach which considers both the likelihood of exposure together with potential adverse effects of endocrine active substances makes best use of available information to regulate their use."

New attack on EU policy regarding endocrine disruption: Health DG SANCO prepares an escape route for pesticides 20/05/2014. Pesticides Action Network Europe puts out a Press Release:²⁸⁶

"Commission health service DG SANCO is on its way to develop an escape route for endocrine disrupting pesticides that will be banned in future. This is done behind closed doors with EU member states and Food Authority EFSA. Sweden fiercely protested against this initiative because they feel the pesticide Regulation is misused and doesn't allow for a general derogation. Food Authority EFSA is also active in the SANCO working group, lobbying to revise the legislation on endocrines back to traditional risk assessment and encouraging SANCO to use an escape route."

"It also appears from documents released by Commission to PAN Europe (on the PAN website) that EFSA has an active role in the SANCO working group. A representative of the EFSA Scientific Committee writes to Barroso's advisors that they keep on opposing the pesticide legislation and aim to return to traditional risk assessment. This is in line with pesticide industry's efforts. The representative also complains about the pesticide legislation having no "control route" or "socio-

²⁸¹ <http://www.efsa.europa.eu/en/gmo/gmomembers.htm>

²⁸² <http://www.efsa.europa.eu/en/scer/scmembers.htm>

²⁸³ <http://www.efsa.europa.eu/en/contam/contammembers.htm>

²⁸⁴ <http://www.rsc.org/suppdata/tx/c3/c3tx90013d/c3tx90013d.pdf>

²⁸⁵ <http://www.efsa.europa.eu/en/topics/topic/eas.htm>

²⁸⁶ <http://www.pan-europe.info/News/PR/140520.html>

economic route" to save endocrine disrupting pesticides from a ban and keep them on the market. The person suggests that the 'negligible exposure' option will be a good option to fill this gap."

Corporate Europe Observatory and Stéphane Horel Report: A Toxic Affair: How the Chemical Lobby Blocked Action on Endocrine Disrupting Chemicals²⁸⁷

Page 2: *"This report tells the story of how a major EU public health initiative was effectively obstructed by corporate lobby groups in tandem with actors within the European Commission. It shows how industry has successfully used some classic tactics of corporate lobbying. This report shows that some civil servants, even though employed in the services in charge of public health in the European Union, seem to have served corporate interests over public ones."*

Page 3: *"Human exposure to endocrine disrupting chemicals (EDCs) has been linked to diseases such as infertility, cancer and obesity. The medical cost of this serious public health issue has been recently estimated at €157 billion a year in the EU alone."*

Page 6: *Endocrine disrupting chemicals (EDCs) can interfere with the hormonal systems of mammals, fish, frogs, and other types of living organisms. Their toxicity only started to be fully acknowledged by scientists in the early 1990s. EDCs have the ability to mimic, block, or alter the levels of hormones such as oestrogens, testosterone, or thyroid hormones whose actions affect many functions of the body. Exposure to these chemicals in the early developmental stages of an organism can cause irreversible effects that will only become evident later in life. There is a high probability that EDCs play a role in the genesis of many 'modern' diseases such as prostate, breast, and testicular cancers, infertility, genital abnormalities, brain development, diabetes, and obesity."*

Page 7: ***Brussels nowadays is the second capital of corporate lobbying in the world – after Washington DC. An estimated 20,000-30,000 lobbyists populate the EU quarter, the large majority of whom represents corporations. All big corporations have their own lobby offices and in-house lobbyists.***

Page 8: *Lobby groups often employ the classic tactic of the 'revolving door': in other words, to hire people who come straight from a job in government. Many lobbyists are former Commission officials or Members of the European Parliament, or Parliament or Council staff. They are therefore in a good position to then lobby their former colleagues, and they know how the system works from the inside. The revolving doors can also spin in the other direction, that is, when someone from within the industry moves to a key position in a public authority."*

Page 13 there are examples of lobbying emails sent by industry to various targets in the European Commission.

The USDA made a submission to Europe on endocrine disruptors.²⁸⁸ They identified Public Health, Environmental Protection and Climate Change, Food Security, Consumer Welfare, Trade and Jobs. Conclusion: *U.S. stakeholder analysis suggests the failure to adopt a scientific approach could impact €65.3 billion worth of imports into the EU (of which over €4 billion worth would be U.S. exports). The United States Government fully supports measures to protect public health and the environment. We urge the Commission to take the U.S. comments into account and to adopt an approach that fully considers the vital role that pesticide chemicals play in food safety and security, while promoting strong levels of protection, inspiring public confidence, and avoiding unwarranted burdens. Such consideration is critical to accomplishing our joint purpose and to ensuring that any decisions are informed by risk assessments.*

Sweden decides to sue the EU Commission for delay on identifying hormone disrupting chemicals

On May 22 2014, Agence France Presse (AFP): Sweden said it would sue the European Commission over a delay in identifying harmful chemicals in everyday products, which it blamed on chemical

²⁸⁷ http://corporateeurope.org/sites/default/files/toxic_lobby_edc.pdf

²⁸⁸ <http://www.usda-eu.org/wp-content/uploads/2015/01/United-States-Submission-Endocrine-Disrupters-2015-01-20.pdf>

industry lobbying.²⁸⁹

"This delay is due to the European chemical lobby, which put pressure again on different Commissioners," Swedish Environment Minister Lena Ek told AFP.

The Commission was due to set criteria by December 2013 to identify endocrine disrupting chemicals (EDCs) in thousands of products — including disinfectants, pesticides and toiletries — which have been linked to cancers, birth defects and development disorders in children. *"Hormone disrupters are becoming a huge problem,"* said Ek, explaining that Sweden and Denmark had written to the Commission to demand action but to little avail.

"In some places in Sweden we see double sexed fish. We have scientific reports on how this affects fertility of young boys and girls, and other serious effects."

In an unprecedented move, in January 2015, both the European Parliament and the Council (all Member States together) decided to officially support Sweden's court case against the Commission over its failure to establish criteria for EDCs. An overwhelming 21 Member States voted in favour, while only a few abstained, such as the UK.²⁹⁰

Commission delays further by consulting the public on criteria to identify Endocrine Disruptors²⁹¹

The Commissioners launch a consultation on 29 September 2014 with closing date 15 January 2015.

Letter to Vytenis Andriukaitis Commissioner for Health & Safety from 11 MEPs: economic impacts on industry are taking precedence over human health and the environment²⁹²

On 20/01/2015: *"Endocrine disrupting chemicals cause adverse health effects in an intact organism. This is particularly relevant during pregnancy, where it can affect developmental processes of the foetus in an irreversible manner. Cancer, infertility, diabetes, obesity and behavioural disorders have all been linked to exposure to endocrine disrupters...Back in 2009 the European Parliament and the Council adopted the Regulation (EC) No 2009/1107 on plant protection products. It included so called cut-off criteria for endocrine disrupters: active substances in pesticides should no longer be authorized if they were endocrine disrupters, unless there was a serious danger which cannot be contained by other available means, including non-chemical methods... firstly, concrete interim criteria for endocrine disrupters were adopted, and secondly, the legislator gave a mandate to the Commission to come up with permanent criteria by the end of 2013.*

Moreover, it makes the decision about what should be the appropriate definition for endocrine disrupters depend on the socio-economic impact on the industry and the substitutability of these substances when used as pesticides and biocides. However, such economic considerations are totally irrelevant when it comes to the question of what is an endocrine disruptor. "

DETERIORATION OF HEALTH IN THE UK, THE US AND LATIN AMERICA

Since the UK and the US discovered 2,4-D at the same time in 1941, both have been locked into a pattern of farming with chemicals

THE CMO AND PHE ENGLAND TRIES TO EXPLAIN AWAY ALL THE DISEASES AFFECTING THE UK

Many diseases in the UK and the US are spiralling out of control; obesity, diabetes, congenital anomalies, cancers, etc. The Government and the NHS blame the people, but chemicals and corporations are to blame. Increasing obesity, autism, Alzheimer's, Diabetes, liver failure, kidney failure, heart disease, mental disorders, depression, suicide, hypercholesterolaemia and cancers have been acknowledged. They have been blamed on public lifestyle (such as overeating, lack of

²⁸⁹ <http://www.capitalfm.co.ke/business/2014/05/sweden-to-sue-eu-for-delay-on-hormone-disrupting-chemicals/>

²⁹⁰ <https://chemicalwatch.com/22729/eu-council-joins-edcs-legal-action-against-commission>

²⁹¹ http://europa.eu/rapid/press-release_IP-14-1057_en.htm?locale=en

²⁹² <http://www.michele-rivasi.eu/au-parlement/lettre-au-commissaire-europeen-a-la-sante-sur-les-criteres-de-definition-des-perturbateurs-endocriniens/>

exercise, alcoholism and smoking), failures of GPs, isolation or global warming. The rest has been ignored. Congenital anomalies, Parkinson's, Motor Neurone Disease, Brain Tumours, Lymphomas, infertility, cataracts, inflammatory bowel disease are amongst the medical conditions which are increasing. Britain and the US whose farming systems depend on chemicals must be the only countries where the citizens haven't been told that glyphosate has been declared a probable carcinogen to humans, according to WHO International Agency for Research into Cancer (IARC).²⁹³

EPIDEMICS OF DIABETES, OBESITY AND AUTISM IN SCOTLAND (2013)

Global epidemics of diabetes

Ms Judson, Scottish Director of Diabetes UK, was quoted as saying: *"Since 2006 the incidence of diabetes had increased by 25.6% and the consequences of diabetes such as blindness and the need for amputation were also increasing in younger age groups."* She said people as young as 13 have been diagnosed with Type 2 diabetes.²⁹⁴

Global epidemic of obesity

A similar warning about obesity had come from Dr Andrew Fraser representing the Royal College of Physicians of Edinburgh on 10th March 2013.²⁹⁵

Global epidemics of Autism and Attention Deficit Hyperactivity Disorder (ADHD)

On June 12/13th 2013, an autism conference was held in Edinburgh.²⁹⁶ Dr Martha Herbert, an expert on autism from Harvard Medical School, was an invited speaker. Dr Herbert believes the culprit is an environmental toxin in autistic children that interferes with nutrient absorption. *"We need to get them built up again, getting the gut micro-flora sorted out"*. The US has had an even more dramatic (and earlier) rate of increase than in Scotland (261% for boys and 385% for girls between 1997 and 2008)²⁹⁷.

In the US:

- In 1970: one child in 10,000 was born with Autism
- In 2007: one child in 150 was born with Autism
- In 2009: one child in 100 was born with Autism
- In 2013: one child in 50 was born with Autism

If the rate continues to increase *'pro-rata'* Dr Stephanie Seneff predicts that by 2025, one child in two in the US will develop Autism.²⁹⁸ The increases in rates of autism have close correlations in the US with glyphosate sprayed on crops and percentage of GM crops grown.²⁹⁹

In the UK

- In 2012 one child in 100 was born with Autism

So, Britain is only 3 years behind the US.

The UK has been receiving glyphosate residues in staple foods since 1980 because farmers have been spraying pre-harvest and throughout the crop year.³⁰⁰ Their advice on how and when to use glyphosate comes from <http://www.glyphosate.eu/> It produces advice via a series of downloads for farmers. Glyphosate.eu in turn receives advice straight from the European Glyphosate Task Force (GTF). This is a consortium of 24 companies joining resources and efforts in order to renew the European glyphosate registration with a joint submission.³⁰¹

²⁹³ [http://www.thelancet.com/pdfs/journals/lanonc/PIIS1470-2045\(15\)70134-8.pdf](http://www.thelancet.com/pdfs/journals/lanonc/PIIS1470-2045(15)70134-8.pdf) Carcinogenicity of tetrachlorvinphos, parathion, malathion, diazinon, and glyphosate.

²⁹⁴ <http://www.thetimes.co.uk/tto/health/news/article3799473.ece>

²⁹⁵ <http://www.scotsman.com/news/health/doctors-warn-obesity-is-lifestyle-choice-for-scots-1-2828840>

²⁹⁶ <http://www.scotsman.com/lifestyle/autism-unlocking-a-generation-1-2944710>

²⁹⁷ 87222060-CDC-Autism-Study-March-2012.pdf

²⁹⁸ <http://www.youtube.com/watch?v=JB4GFyiewHQ>

²⁹⁹ <http://www.organic-systems.org/journal/92/abstracts/Swanson-et-al.html>

³⁰⁰ http://www.glyphosate.eu/system/files/sidebox-files/agronomic_benefits_of_glyphosate_for_european_agriculture.pdf

³⁰¹ <http://www.glyphosatataskforce.org/>

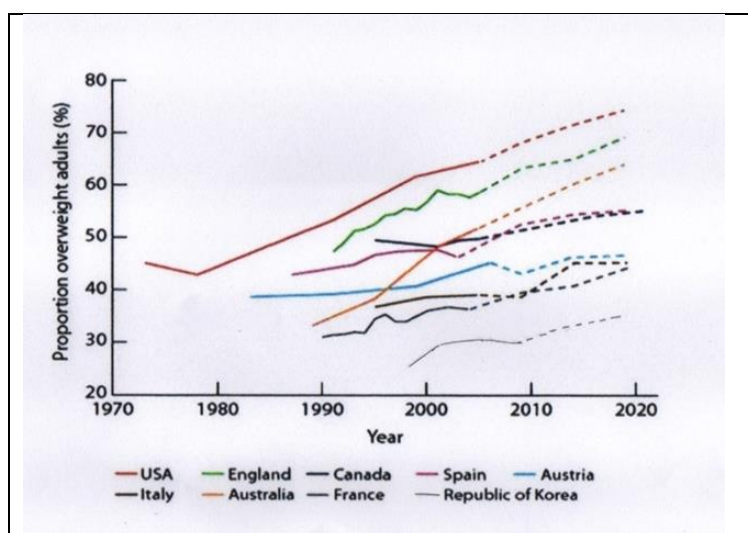
Overweight and obesity in mid-life: Evidence from the 1970 British Cohort Study³⁰²

The Centre for Longitudinal Studies based at the Institute of Education University of London published their latest report on 9 November 2013.

Their key findings of the cohort at age 42 were that:

- The generation born in 1970 is considerably more likely to be overweight or obese than those born 12 years earlier were at the same age.
- Men born in 1970 are far more likely to be overweight than women.³⁰³

Obesity levels in England are second only to the US and are running a parallel course to the US **Historical and projected overweight rates in OECD countries**³⁰⁴



Some of the UK population has been exposed to glyphosate residues in foods since 1980, even without growing GM Glyphosate-Tolerant crops.³⁰⁵ The US has had GM crops since 1996. The third area with the most overweight adults is Australia, where obesity levels started to rise steeply in 1990 and by 2000 have overtaken Spain and Canada, both of which have GMs. There are 553 glyphosate products registered in Australia. Glyphosate use on GM crops is accelerating. GM canola was registered in 2003, but bans in NSW and Victoria were lifted in 2008.³⁰⁶ Canola has been registered to be desiccated since October 2014³⁰⁷ and sunflowers since 2012.³⁰⁸ However, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) is promoted as Australia's 'pre-eminent public scientific research body'. *"Although ostensibly publicly funded, CSIRO has, in reality, been encouraged to get 30% of its funding from business, with the CSIRO top management encouraging its staff to go to 40%."* According to John Stocker, CSIRO's former Chief Executive: *"Working with the transnationals makes a lot of sense, in the context of market access. There are very few Australian*

³⁰² [Overweight and obesity in mid-life: Evidence from the 1970 British Cohort Study at age 42](#)

³⁰³ The use of glyphosate for desiccation on both barley and wheat was accepted by the brewing and distilling industries in 2007 therefore it is probable that men are more likely to be overweight because of the consumption of beer or whisky with glyphosate residues

<http://www.grainfarmers.co.uk/seeddownloads/Roundup%20on%20seed%20milling%20and%20malting.pdf>

³⁰⁴ Healthy Choices OECD Health Ministerial Meeting, Paris, 7-8 October 2010

<http://www.oecd.org/health/ministerial/46098333.pdf>

³⁰⁵ <http://www.hgca.com/media/185527/is02-pre-harvest-glyphosate-application-to-wheat-and-barley.pdf>

³⁰⁶ <http://www.sbs.com.au/news/article/2012/11/15/factbox-gm-foods-australia>

³⁰⁷ <http://www.farmweekly.com.au/news/agriculture/cropping/general-news/new-canola-weed-control-option/2714416.aspx>

³⁰⁸ http://www.australianoilseeds.com/about_aof/news/glyphosate_as_a_desiccant_in_sunflowers

companies that have developed market access in the United States, in Europe and in Japan, the world's major marketplaces. Yes, we do find that it is often the best strategy to get into bed with these companies." ³⁰⁹

Children: Almost one in four Australian children (23%) is overweight or obese and one in three expected to be by 2025 (AIHW 2012). Children who are obese are more likely than other children to develop asthma, type 2 diabetes, cardiovascular conditions and some cancers. Cancer Research UK website shows similar trends for certain cancers.

Parkinson's, Alzheimer's and other Dementias, and Motor Neurone Disease

In the UK Statistics: Every hour, someone in the UK is told they have Parkinson's. One person in every 500 has Parkinson's. That's about 127,000 people in the UK. ³¹⁰

Substantial increase in neurological deaths 1979-2010

Ten major developed Western countries and 10 smaller Western countries were studied. ³¹¹ There was a major reduction in general mortality in all 20 countries, but total neurological deaths rose substantially between 1980 and 2010 in both sexes in 16 out of 20 western countries; in particular early onset Parkinson's, Alzheimer's and other Dementias, and Motor Neurone Disease. Female neurological deaths in 9 out of 10 countries were greater than males. The authors thought the causes were likely to be epigenetic rather than hereditary. *"Moreover, looking back 30 or more years the concept of early dementia or the need for the creation of a Young Parkinson's Disease Society in Britain would have seemed a tautology."*

Another paper elucidated the pathological mechanisms by which the herbicide glyphosate could cause Parkinson's disease and other neurodegenerative disorders. ³¹²

Diabetes, obesity and the gut microbiome: Monsanto's false claims about glyphosate

Since 1996, the number of people with diabetes in the UK has more than doubled from 1.4 million to 3.3 million; 90 per cent of people with diabetes have Type 2 diabetes. ³¹³

Monsanto and pesticide regulators say that glyphosate inhibits an enzyme that is essential for the biosynthesis of certain amino acids and claim that this enzyme is not found in animals and humans. ³¹⁴

- Humans and animals have exactly the same pathway as in plants; mammals can only absorb nutrients via the bacteria in their gut; the gut microbiome. **The gut microbiome is the collective genome of organisms inhabiting our body.** Glyphosate residues in food disrupt the pathway which involves 5-enolpyruvylshikimate-3-phosphate synthase. Beneficial bacteria are destroyed, causing inflammatory changes in the gut lining, destroying its absorptive capacity in humans and animals, chelating (extracting or grabbing) minerals, depleting micronutrients and interfering with multiple metabolic processes resulting in obesity, type 2 diabetes, autism, dementia, cancers, inflammatory bowel diseases (Ulcerative Colitis and Crohn's disease), celiac disease, hypercholesterolaemia and many other disorders associated with those on a Western diet. ³¹⁵ Chatelier, E.L. *et al.* Richness of human gut microbiome correlates with metabolic markers *Nature* 29 August 2013; **500**: 541-

³⁰⁹ <http://www.gmwatch.org/latest-listing/1-news-items/13325-csiro-in-bed-with-multinationals>

³¹⁰ <http://www.parkinsons.org.uk/content/facts-journalists#sthash.EPohX00v.dpuf>

³¹¹ <http://dx.doi.org/10.1016/j.phe.2012.12.018> Pritchard, C. *et al.* Changing patterns in mortality from neurological deaths in the 10 major developed countries 1979-2010 Public Health (2013)

³¹² <http://www.sciencedirect.com/science/journal/08920362>

<http://www.activistpost.com/2012/04/roundup-herbicide-linked-to-parkinsons.htm>

³¹³ <https://www.diabetes.org.uk/Documents/Position%20statements/Facts%20and%20stats%20June%202015.pdf>

³¹⁴

http://www.bfr.bund.de/en/press_information/2014/03/glyphosate_no_more_poisonous_than_previously_assumed_although_a_critical_view_should_be_taken_of_certain_co_formulants-188898.html

³¹⁵ <http://www.mdpi.com/1099-4300/15/4/1416>

550.³¹⁶ *"We are facing a global metabolic health crisis provoked by an obesity epidemic."* In a multi-author study of obese and non-obese individuals, those with *"low bacterial richness in the gut (23% of the population) are characterized by more marked overall adiposity, insulin resistance and dyslipidaemia and a more pronounced inflammatory phenotype when compared with those with high bacterial richness...Low richness of gut microbiota has been reported in patients with inflammatory bowel disorder...Also notable diversity differences were observed between the urban US population and rural populations from two developing countries"*. Current research is underway to try to find the links between obesity, type 2 diabetes and cancers. Diet rapidly and reproducibly alters the human gut microbiome³¹⁷ *"Long-term dietary intake influences the structure and activity of the trillions of microorganisms residing in the human gut" ... In concert, these results demonstrate that the gut microbiome can rapidly respond to altered diet, potentially facilitating the diversity of human dietary lifestyles.*

A Class Action Lawsuit is taken out by Los Angeles County against Monsanto for false advertising³¹⁸

Monsanto has misled everyone, including the German Rapporteur Member State, the European Food Safety Authority and the UK Chemicals Regulation Directorate.

The Class Action Lawsuit taken out by Los Angeles County against Monsanto is for false advertising. Monsanto, on its label, claims that Roundup® doesn't affect humans and pets because they don't have the shikimate (EPSP) pathway which plants have.³¹⁹

It is a false statement. Glyphosate not only affect plants, but humans/animals as well. The pesticides industry and its regulators are ignorant of human physiology. Humans (and animals) absorb nutrients through trillions of microbes in their gut, the human microbiome. These microbes **do** possess the enzyme pathway that is targeted by Roundup®. It is further stated in the lawsuit that there are many human and animal health problems associated with the disruption of our intestinal microbes.

"Because it kills-off our gut bacteria, glyphosate is linked to stomach and bowel problems, indigestion, ulcers, colitis, gluten intolerance, sleeplessness, lethargy, depression, Crohn's Disease, Celiac Disease, allergies, obesity, diabetes, infertility, liver disease, renal failure, autism, Alzheimer's, endocrine disruption, and the W.H.O. recently announced glyphosate is 'probably carcinogenic'."

The lawsuit was due to be heard on July 10th 2015, but the judge has delayed it until August.

A similar lawsuit has been announced by lawyers in New York.³²⁰

UK farmers continue to use glyphosate while lawsuits against Monsanto in the US increase

On 17/11/2015, in response to my 13-page Open Letter to the NFU³²¹ their President wrote: *"the NFU firmly believes that technologies such as advanced plant breeding, biotechnology and chemical crop protection are a positive and essential part of British farming and food production."*

This statement is made at the same time as "Personal injury law firms around the United States are lining up plaintiffs for what they say could be "mass tort" actions against agrichemical giant Monsanto Co that claim the company's Roundup herbicide has caused cancer in farm workers and others exposed to the chemical."³²²

The lawsuit is similar to others filed last month in New York and California accusing Monsanto of long knowing that the main ingredient in Roundup, glyphosate, was hazardous to human health.

³¹⁶ <http://www.nature.com/nature/journal/v500/n7464/abs/nature12506.html>

³¹⁷ <http://www.nature.com/nature/journal/vaop/ncurrent/full/nature12820.html>

³¹⁸ <http://www.monsantoclassaction.org/>

³¹⁹ <http://www.examiner.com/article/monsanto-sued-los-angeles-county-for-false-advertising>

³²⁰ <http://www.aboutlawsuits.com/roundup-class-action-lawsuit-85070/>

³²¹ https://www.academia.edu/17144792/Open_Letter_to_the_National_Farmers_Union

³²² <http://uk.reuters.com/article/2015/10/15/us-usa-monsanto-lawsuits-idUKKCN0S92H720151015>

Monsanto "led a prolonged campaign of misinformation to convince government agencies, farmers and the general population that Roundup was safe," the lawsuit states."

Since Anthony Samsel's analysis of Monsanto's sealed secret documents showed that they knew it caused cancer in the 1970s³²³ he says he has been asked to be an advisor to law firms

At least 700 lawsuits against Monsanto or Monsanto-related entities are pending, brought by law firms on behalf of people who claim their non-Hodgkin lymphoma was caused by exposure to PCBs that the company had manufactured until the late 1970s.³²⁴ Now, the law firms are concentrating on three studies linking Roundup and Non-Hodgkin's Lymphoma. This is a quote taken from Matthews and Associates website.³²⁵

"The following studies of occupational glyphosate exposure in the United States, Canada, and Sweden found increased rates of non-Hodgkin's lymphoma that persisted after adjustment for other pesticides:

- [International Journal of Cancer](#) (October 2008): Swedish study concluded that exposure to glyphosate doubled the risk of developing non-Hodgkin's lymphoma within less than 10 years.
- [Occupational and Environmental Medicine](#) (September 2003): American study of over 3,400 farmworkers in the mid-west found higher rates of non-Hodgkin's lymphoma associated with glyphosate exposure.
- [Cancer Epidemiology Biomarkers](#) (November 2001): Canadian study found a dose-response relationship between glyphosate exposure and non-Hodgkin's lymphoma."

Global burden of disease study 2010 shows declines in the health of the UK and US

Between 1990 and 2010, Britain and the US have slipped down the scale of health compared with other wealthy nations and the patterns of disease are remarkably similar.

In the US: "However, morbidity and chronic disability now account for nearly half of the US health burden, and improvements in population health in the United States have not kept pace with advances in population health in other wealthy nations".³²⁶ In the UK: "The performance of the UK in terms of premature mortality is persistently and significantly below the mean of EU15+ and requires additional concerted action... premature mortality from several major causes such as cardiovascular disease and cancers...In terms of premature mortality worsening ranks are most notable for men and women aged 20-54 years. Increases in Alzheimer's disease, breast cancer, oesophageal cancer, congenital anomalies "and a growing burden of disability, particularly from mental disorders" are all acknowledged.³²⁷

Glyphosate and GM crops associated with declines in health in the US

Genetically-engineered crops, glyphosate and the deterioration of health in the United States of America. Swanson et al.³²⁸

Abstract: A huge increase in the incidence and prevalence of chronic diseases has been reported in the United States (US) over the last 20 years. Similar increases have been seen globally. The herbicide glyphosate was introduced in 1974 and its use is accelerating with the advent of herbicide-tolerant genetically engineered (GE) crops. Evidence is mounting that glyphosate interferes with many metabolic processes in plants and animals and glyphosate residues have been detected in both.

³²³

https://www.academia.edu/17751562/Glyphosate_pathways_to_modern_diseases_IV_cancer_and_related_pathologies

³²⁴ <http://uk.reuters.com/article/2015/10/15/us-usa-monsanto-lawsuits-idUKKCN0S92H720151015>

³²⁵ <http://www.dmlawfirm.com/monsanto-lawsuit>

³²⁶ <http://www.ncbi.nlm.nih.gov/pubmed/23842577> The state of US health, 1990-2010: burden of diseases, injuries, and risk factors

³²⁷ <http://www.ncbi.nlm.nih.gov/pubmed/23668584> UK health performance: findings of the Global Burden of Disease

Study 2010

³²⁸ http://www.organic-systems.org/journal/92/JOS_Volume-9_Number-2_Nov_2014-Swanson-et-al.pdf

Glyphosate disrupts the endocrine system and the balance of gut bacteria, it damages DNA and is a driver of mutations that lead to cancer.

In the present study, US government databases were searched for GE crop data, glyphosate application data and disease epidemiological data. Correlation analyses were then performed on a total of 22 diseases in these time-series data sets. The Pearson correlation coefficients are highly significant ($< 10^{-5}$) between glyphosate applications and hypertension ($R = 0.923$), stroke ($R = 0.925$), diabetes prevalence ($R = 0.971$), diabetes incidence ($R = 0.935$), obesity ($R = 0.962$), lipoprotein metabolism disorder ($R = 0.973$), Alzheimer's ($R = 0.917$), senile dementia ($R = 0.994$), Parkinson's ($R = 0.875$), multiple sclerosis ($R = 0.828$), autism ($R = 0.989$), inflammatory bowel disease ($R = 0.938$), intestinal infections ($R = 0.974$), end stage renal disease ($R = 0.975$), acute kidney failure ($R = 0.978$) cancers of the thyroid ($R = 0.988$), liver ($R = 0.960$), bladder ($R = 0.981$), pancreas ($R = 0.918$), kidney ($R = 0.973$) and myeloid leukaemia ($R = 0.878$).

The Pearson correlation coefficients are highly significant ($< 10^{-4}$) between the percentage of GE corn and soy planted in the US and hypertension ($R = 0.961$), stroke ($R = 0.983$), diabetes prevalence ($R = 0.983$), diabetes incidence ($R = 0.955$), obesity ($R = 0.962$), lipoprotein metabolism disorder ($R = 0.955$), Alzheimer's ($R = 0.937$), Parkinson's ($R = 0.952$), multiple sclerosis ($R = 0.876$), hepatitis C ($R = 0.946$), end stage renal disease ($R = 0.958$), acute kidney failure ($R = 0.967$), cancers of the thyroid ($R = 0.938$), liver ($R = 0.911$), bladder ($R = 0.945$), pancreas ($R = 0.841$), kidney ($R = 0.940$) and myeloid leukaemia ($R = 0.889$). The significance and strength of the correlations show that the effects of glyphosate and GE crops on human health should be further investigated.

*In the US glyphosate and GM crops have high correlations with human diseases, including cancers. Public Health England shares my concern about the prevalence of chronic diseases in the UK such as obesity, type 2 diabetes, cardiovascular disease and cancer.*³²⁹

We are drowning our world in unsafe and untested chemicals³³⁰

By Gabrielle Canon 01/10/2015

The International Federation of Gynecology and Obstetrics (FIGO), a group representing OB-GYNs from 125 countries, released a report detailing the detrimental health effects caused by even small exposure to common chemicals like the ones found in pesticides, plastics, and air pollution.³³¹ The health problems are even greater for babies exposed in the womb, who face increased risks of cancer, reduced cognitive function, and even miscarriage or stillbirth. The organization cited concerns about the sharp increase over the past four decades in chemical manufacturing, which continues to grow by more than 3 per cent every year. Some 30,000 pounds of chemicals were manufactured or imported for every person in the United States in 2012 alone—a whopping 9.5 trillion pounds in total. Annually, the FIGO authors write, chemical manufacturing leads to 7 million deaths and billions in health care costs.

In an article in the UK about why we should eat organic food,³³² the journalist said that in 31,000 tonnes of chemical are used in farming in the UK each year.

The first G8 Dementia Summit in London 2013

Dementia affects an estimated 35 million people worldwide, a figure set to almost double every 20 years.³³³ The Alzheimer's Society reported in 2013 that there are about 800,000 people in the U.K. who have dementia. One in three people age 65 and above will develop the condition. Two-thirds are women. The world's first G8 dementia summit was held in London on 11 December 2013, bringing together ministers, researchers, pharmaceutical companies and charities to discuss what can be done. David Cameron appointed a World Dementia Envoy March 2014, Dennis Gillings. He

³²⁹ Personal communication: email January 2015.

³³⁰ <http://www.motherjones.com/environment/2015/10/human-reproduction-threatened-pollution>

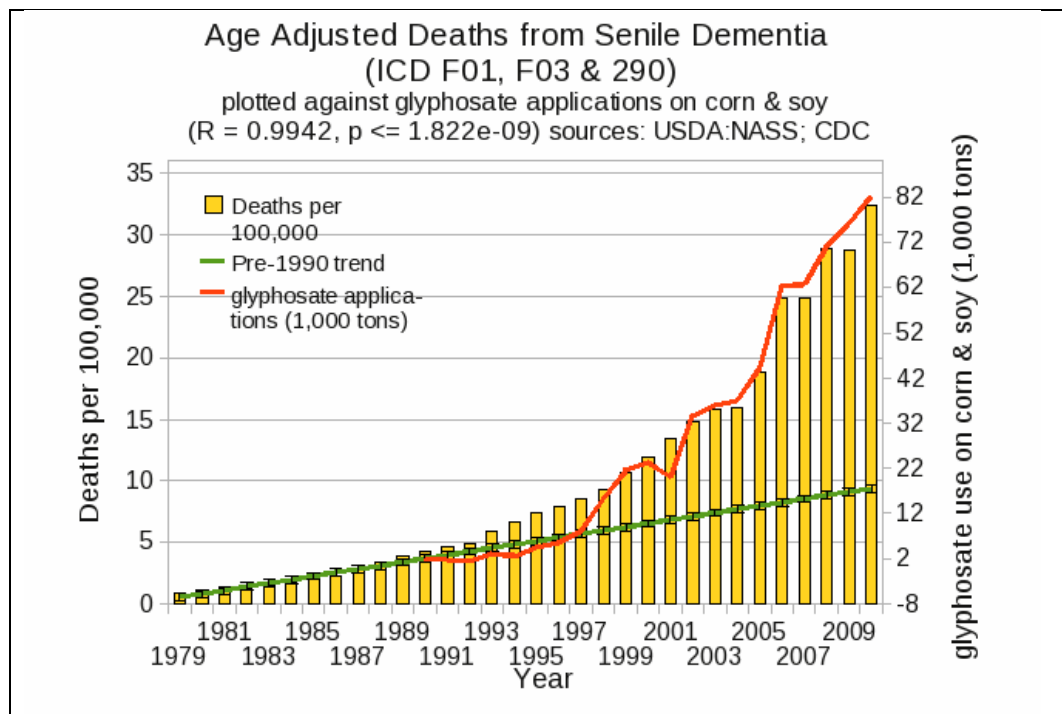
³³¹ http://www.figo.org/sites/default/files/uploads/News/Final%20PDF_8462.pdf

³³² <http://www.theguardian.com/commentisfree/2015/oct/07/why-should-i-eat-organic-google>

³³³ <https://www.gov.uk/government/publications/g8-dementia-summit-global-action-against-dementia/g8-dementia-summit-global-action-against-dementia-11-december-2013>

was founder and executive chair of Quintiles, the world's largest provider of biopharmaceutical development and commercial outsourcing services, and benefactor of the UNC Gillings School of Global Public Health, is a biostatistician who is expert in the workings of clinical trials.³³⁴ He served as a faculty member in the UNC biostatistics department for more than 15 years.

G8 DEMENTIA SUMMIT DECLARATION: We, the G8 Health Ministers, met at the G8 Dementia Summit in London on 11 December 2013 to discuss how to shape an effective international response to dementia.³³⁵



Published with the kind permission of Dr Nancy Swanson

Link between mid-life obesity and dementia: a twin study³³⁶

Both overweight and obesity at midlife independently increase the risk of dementia, Alzheimer's disease and vascular dementia. Genetic and early-life environmental factors may contribute to the midlife high adiposity-dementia association.

Excess risk of cancers in those exposed to pesticides (farming, commercial, home and garden)³³⁷

Abstract: A growing number of well-designed epidemiological and molecular studies provide substantial evidence that the pesticides used in agricultural, commercial, and home and garden applications are associated with excess cancer risk. This risk is associated both with those applying the pesticide and, under some conditions, those who are simply bystanders to the application.

³³⁴ <http://sph.unc.edu/sph-news/gillings-appointed-by-uks-prime-minister-to-accelerate-diagnosis-treatment-cure-for-dementia/>

³³⁵

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/265869/2901668_G8_DementiaSummit_Declaration_acc.pdf

³³⁶ <http://www.ncbi.nlm.nih.gov/pubmed/21536637>

³³⁷ <http://onlinelibrary.wiley.com/doi/10.3322/caac.21170/full>

Michael C. R. Alavanja, Matthew K. Ross, Matthew R. Bonner Increased Cancer Burden Among Pesticide Applicators and Others Due to Pesticide Exposure. *CA Cancer J Clin* 2013 American Cancer Society

In this article, the epidemiological, molecular biology, and toxicological evidence emerging from recent literature assessing the link between specific pesticides and several cancers including prostate cancer, non-Hodgkin lymphoma, leukemia, multiple myeloma, and breast cancer are integrated. Rather than wait for human carcinogens to be identified, several European countries, including Sweden, Denmark, the Netherlands, and others, have initiated pesticide use reduction policies that have resulted in substantially diminished pesticide use overall. In the United States, a nationwide use reduction policy has met with resistance politically because of disagreements about the net benefit to health and debate concerning the disproportionate economic impact of these policies on selected groups (e.g. farmers, food processors, and pesticide manufacturers) and on food prices. Nonetheless, the available scientific evidence does strongly suggest that pesticides do cause cancer in both those who use the pesticides directly and those who are exposed because of applications others make ... “...yet the identification of specific pesticides as human carcinogens has not yet been made.”

Cancer Research UK (CRUK) website shows increasing trends in cancers

The Cancer Research UK (CRUK) website shows similarly increasing trends over time in graphs from 1975 (when glyphosate was introduced) for thyroid cancer,³³⁸ breast cancer,³³⁹ prostate cancer,³⁴⁰ malignant melanoma,³⁴¹ liver cancer,³⁴² myeloma,³⁴³ and anal cancer.³⁴⁴

UK cancer survival rates trail 10 years behind other European countries

Cancer survival rates in the UK are still lagging more than two decades behind those achieved in many European countries, according to new analysis by campaigners on 25th March 2015.³⁴⁵ The Concord-2 global study looked at survival rates in 67 countries for patients diagnosed with lung, breast, colon and stomach cancers in 1995 to 1999, compared with levels in 2005 to 2009.

THE EFFECTS OF CHEMICALS ON THE DEVELOPMENT OF THE BRAIN³⁴⁶

ONLY ONE CHANCE: How Environmental Pollution Impairs Brain Development - and How to Protect the Brains of the Next Generation by Professor Philippe Grandjean: Oxford University Press.

Chemical brain drain: insidious and pervasive

“Today, one out of every six children suffers from some form of neurodevelopmental abnormality. The causes are mostly unknown. Some environmental chemicals are known to cause brain damage and many are suspected of it, but few have been tested for such effects. The brain’s development is uniquely sensitive to toxic chemicals and even small deficits may negatively impact our academic achievements, economic success, risk of delinquency, and quality of life. Chemicals such as mercury, polychlorinated biphenyls (PCBs) arsenic and certain pesticides pose an insidious threat to the next generation’s brains. When chemicals in the environment affect development of the child’s brain, he or she is at risk for mental retardation, cerebral palsy, autism, ADHD, and a range of learning disabilities and other deficits that will remain for a lifetime. The chemical brain drain can be halted to protect the next generation’s brainpower. First, we need to control all of the 200 industrial chemicals that have already been proven to affect brain functions in adults, as their effects on the developing brain are likely even worse. We must also demand routine testing for brain toxicity, stricter regulation of emissions of brain-toxic chemicals, and required disclosure on the part of industries that unleash these hazardous chemicals into products and the

³³⁸ <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/thyroid/incidence/>

³³⁹ <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/breast/incidence/#trends>

³⁴⁰ <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/prostate/incidence/uk-prostate-cancer-incidence-statistics#trends>

³⁴¹ <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/skin/incidence/uk-skin-cancer-incidence-statistics#trends>

³⁴² <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/liver/incidence/#trends>

³⁴³ <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/myeloma/incidence/#trends>

³⁴⁴ <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/anal-cancer/Incidence/#Trends>

³⁴⁵ <http://www.theguardian.com/society/2015/mar/24/uk-cancer-survival-rates-trail-10-years-behind-those-in-european-countries>

³⁴⁶ www.chemicalbrainrain.info

environment. Decisions can still be made to protect the brains of future generations – and some decisions appear to be seriously overdue. This site aims at furthering information on chemical risks to brain development and ways to protect the next generation against chemical brain drain."

Review of Philippe Grandjean's book by the late THEO COLBORN, PHD, President, TEDX (the Endocrine Disruptor Exchange) see page EDCs

"This book is a huge gift to humankind from an eminent scientist. Grandjean tells the truth about how we have been ruining the brainpower of each new generation and asks if there are still enough intelligent people in the world today to reverse the problem. I cannot rid myself of the idea that too many brains have been drained and society is beyond the point of no return. We must learn from the follies and scandals that Grandjean reveals and stop the chemical brain drain before it is too late."

Academic performance of 15-year-olds has deteriorated since the 1990s says Gove; the UK ratings have declined significantly in the Programme for International Student Assessment (PISA)

Academic performance of 15-year-olds has deteriorated since the 1990s said Michael Gove, the former UK Education Secretary; the UK ratings have declined significantly in the Programme for International Student Assessment. PISA is a worldwide study by the Organisation for Economic Co-operation and Development (OECD) in member and non-member nations of 15-year-old school pupils' scholastic performance on mathematics, science, and reading.³⁴⁷ PISA was first performed in 2000 and then repeated every three years. It is done with a view to improving education policies and outcomes. It measures problem solving and cognition in daily life.

The UK is falling behind global rivals in international tests taken by 15-year-olds, failing to make the top 20 in mathematics, reading and science (3 December 2013). Although not directly comparable, because there have been different numbers of countries taking part, this marks a sustained decline, with the UK having ranked 4th in the tests taken in 2000.

The UK has made little progress and remains among the average, middle-ranking countries, in 26th place for mathematics and 23rd for reading, broadly similar to three years ago. Michael Gove said since the 1990s, various test performances in UK schools had been "*at best stagnant, at worst declining*".³⁴⁸

Children in the UK have been exposed to toxic chemicals at home and at school from the earliest stage of development in utero when their brain is only the size of that of an insect

Dr Henk Tennekkes was the first independent researcher to recognize the extreme toxicity of low levels of systemic neonicotinoid insecticides, which have become widespread in the environment.³⁴⁹

They cause a virtually irreversible blockage of postsynaptic nicotinic acetylcholine receptors (nAChRs) in the central nervous system of insects (to which the human foetus is also exposed). He said the damage is cumulative, and with more exposure more receptors are blocked. He predicted that there may be no safe level of exposure.

Many independent scientists have demonstrated that the neonicotinoid insecticides have effects on the mammalian brain, particularly on the foetus. In 2000, Tomiwaza *et al.* showed that neonicotinoids acted on mammalian nicotinic acetylcholine receptors as well as those of insects, but considered that the selective nature of its binding (i.e. less affinity than in insects) made them safe for human exposure.³⁵⁰ However, they are long acting and are now widespread in the environment. Clothianidin, for example, has a half-life in soil of up to 1386 days so it accumulates in the soil yet farmers apply neonicotinoids blindly the following year.

³⁴⁷ [http://www.cmec.ca/252/Programs-and-Initiatives/Assessment/Programme-for-International-Student-Assessment-\(PISA\)/PISA-2012/index.html](http://www.cmec.ca/252/Programs-and-Initiatives/Assessment/Programme-for-International-Student-Assessment-(PISA)/PISA-2012/index.html)

³⁴⁸ <http://www.bbc.co.uk/news/education-25187997>

³⁴⁹ http://farmlandbirds.net/sites/default/files/Tennekes_2010_2.pdf

³⁵⁰ <http://pubs.acs.org/doi/abs/10.1021/jf000873c>

Excerpt from 2012 US Report on Children's Health: A Generation in Jeopardy³⁵¹

A Generation in Jeopardy: How pesticides are undermining our children's health & intelligence.

"This report draws from academic and government research, focusing on studies published within the past five years, to chronicle the emerging threat of – with over 1 billion pounds applied on farms and homes annually– to children's health....Our current system of industrial agriculture and pest control relies on chemical inputs sold by a handful of corporations. These multinational corporations wield tremendous control over the system, from setting research agendas to financing, crop selection and inputs throughout the production and distribution chain. Not surprisingly, these same corporations also hold significant sway in the policy arena, investing millions of dollars every year to influence voters, lawmakers and regulators at both the state and federal level to protect the market for pesticides. The result is agriculture, food and pest control systems that serve the interests of these corporations well. It does not, however, serve farmers, who have lost day-to-day control of their operations and are putting themselves and their families in harm's way."

Congenital anomalies have increased in the UK

Even though GM Roundup Ready crops haven't yet been introduced into the UK, there is evidence that congenital anomalies have increased either from glyphosate residues in food (since 1980) or exposure of the foetus to chemicals.

Deaths from in the under 5s in the UK are twice those of Sweden³⁵² and the three main causes are prematurity, congenital malformations and infections. The mortality rates for the three main causes of death in the UK (prematurity, congenital malformations and infections) were 138.5, 112.1 and 63.9, respectively, per 100 000 children for the three years 2006-2008. The mortality rates for the same three conditions in Sweden were 10.1, 88.6 and 34.8, respectively.

Congenital anomalies were also mentioned as having increased in the Global burden of Disease study 1990-2010. (see above).³⁵³

MONSANTO TARGETED LATIN AMERICA FOR ITS EXPERIMENTS IN 1996

Monsanto's Mission Statement for its projects in Latin America (2012 website)

"Monsanto is committed to helping improve lives – especially the lives of farmers in small rural communities around the world." Pablo Vaquero, Monsanto Latin America South corporate affairs director, said: "Today, we are helping to change the lives of many individuals in remote and forgotten communities where opportunities are scarce. We are convinced that by helping with training and education, as a company, we are able to add value to people and their communities." 'Projects have been implemented in 14 provinces in Argentina (Buenos Aires, Santa Fe, Córdoba, La Pampa, San Luis, Santiago del Estero, Entre Ríos, Corrientes, Formosa, Misiones, Salta, Tucumán, Jujuy and Chaco) and one in the Republic of Paraguay. Many farmers and people know about Monsanto Company because of the Roundup® Ready trait, which is a trait that gives in-plant tolerance to Roundup® agricultural herbicides. The trait was introduced to the market in 1996 and brought a whole new element to farmers. In 1996, farmers could now plant soybeans, spray the soybeans with Roundup®, and poof- the weeds were gone and the soybeans were still as healthy as they were before they sprayed the field'.

The same rural communities in which glyphosate was regularly sprayed on Roundup® Ready Soya had increased incidence of birth defects, miscarriages, infertility, cancers, DNA damage, neurological development problems in children and allergies³⁵⁴

³⁵¹ <http://www.panna.org/publication/generation-in-jeopardy>

³⁵² <http://adc.bmj.com/content/early/2015/07/15/archdischild-2014-308059>

³⁵³ <http://www.ncbi.nlm.nih.gov/pubmed/23668584> UK health performance: findings of the Global Burden of Disease Study 2010

³⁵⁴ INGLES-Report-from-the-1st-National-Meeting-Of-Physicians-In-The-Crop-Sprayed-

Towns.pdf :Faculty of Medical Sciences, National University of Cordoba, Argentina, August 27th & 28th 2010

“For nearly 10 years, the residents of rural and periurban areas, where agricultural activities are carried out based on the current model of agro-industrial production, have been demanding to the political authorities, the courts of justice, and also protesting before the general public, because they feel that the health of their communities is being environmentally affected, mainly through sprayings of agrochemicals used for different types of agricultural crops, but also for the handling and storage of these chemicals in populated areas, the waste disposal, as well as the collection of grains soaked with chemicals within the towns. The towns specified in the Monsanto Latin America website above: “ are only some of the places where the increased number of cancer cases, birth defects, reproductive and endocrine disorders, have been suffered and detected ever since systematic pesticide spraying has become commonplace”...

In these towns GM corn and Roundup® Ready Soy required increasing amounts of glyphosate to be sprayed because of glyphosate-resistant weeds.

- In 1996, the sprayings started at less than 2 liters/hectare
- By 2010 some areas are sprayed with 10 liters/hectare, and almost 20 liters/hectare in other areas (five to 10 times the amount of glyphosate over 14 years).

Prof Andr s Carrasco and his team in Buenos Aires showed that glyphosate caused malformations in amphibian and chicken embryos, confirming the effects on humans³⁵⁵

Paganelli, A. *et al.* Glyphosate-Based Herbicides Produce Teratogenic Effects on Vertebrates by Impairing Retinoic Acid Signaling *Chem. Res. Toxicol.*, 2010, 23 (10), 1586–1595

DOI: 10.1021/tx1001749

Reports of neural defects and craniofacial malformations from regions where glyphosate-based herbicides (GBH) are used led them to undertake an embryological approach to explore the effects of low doses of glyphosate in development. Treated embryos were highly abnormal with marked alterations in cephalic and neural crest development and shortening of the anterior-posterior (A-P) axis. It was shown that the effects were due to the glyphosate itself, rather than the additive.

Congenital anomalies in Argentina where GM Roundup® Ready soya has been grown since 1996
Devastating Impacts of Glyphosate Use with GMO Seeds in Argentina 2015³⁵⁶

Dr Medardo  vila Vasquez is a neonatal specialist at the Children's Hospital in Cordoba. He is the coordinator of the Physicians of Crop-Sprayed Towns, a University Network for Environment and Health that campaigns against agrochemical spraying and provides medical treatment to villages suffering from illnesses as a result of agrochemical exposure. Since noticing the health of his patients deteriorate and patterns of illness change, he and the Argentinian lawyer Dr Graciela Gomez have campaigned tirelessly for the protection of local people, particularly children who are some of the worst affected.

“Over the last 20 years, industrial agriculture in Argentina has expanded by almost 50 %, taking over regions intended for other productions, for family farming, and most of all, forests. More and more children are born with defects in these areas, especially if the first months of pregnancy coincide with the time of spraying. Down’s syndrome, spina bifida, myelomeningocele (neural tube defect), congenital heart disease, etc. are diagnosed more frequently in those areas; in some towns and during some years, at triple the normal rates, and directly linked to increased pesticide applications around the towns... Neural tube defects are among the most common developmental birth defects observed, which is consistent with lab studies and farm observations...”

“The model of agricultural production foisted on Argentina by international biotechnology companies has led to 858 % increase in the amount of pesticides used per year, resulting in a massive environmental and health impact in the region.” ...“ Glyphosate is the most commonly used toxic agrochemical in Argentina, comprising 64 % of total sales, and 200 million litres of glyphosate were applied during the last crop season.” ...“ The clinical manifestations that physicians working in the

³⁵⁵ <http://pubs.acs.org/doi/abs/10.1021/tx1001749>

³⁵⁶ http://www.i-sis.org.uk/Devastating_Impacts_of_Glyphosate_Argentina.php

crop-sprayed towns find in patients are consistent with the results of scientific research on the effects of various pesticides including glyphosate on experimental animals. Laboratory research by our Scientists show how glyphosate acts on embryonic development to produce birth defects, and how this poison damages DNA molecules in the cell nucleus, promoting mutant cell lines that will cause cancer if they cannot be eliminated by the individual.

Fig 1: The rise in birth defects correlates with the rise in cultivation of GM glyphosate-tolerant soybeans in Chaco, Argentina. Birth defects per 10 000 live births increased from approx. 15/10,000 live births in 1997 to approx. 82/10,000 live births in 2008.

Evidence of *in vitro* genotoxicity of an environmental metabolite of glyphosate (AMPA) in humans³⁵⁷ as assessed by the Comet assay and cytogenetic tests.

Birth defects in seven regions of Argentina

A report of the many types of birth defects in seven geographical areas of Argentina³⁵⁸ was excluded from the BfR glyphosate re-assessment (in Spanish, with an English abstract).

High frequencies regional analysis showed the following significant results:

severe hypospadias; spina bifida, microtia, cleft lip with cleft palate, polycystic kidney, postaxial polydactyly and Down syndrome; postaxial polydactyly; omphalocele, gastroschisis, cleft lip without cleft palate, cleft lip with cleft palate, anorectal atresia/stenosis, indeterminate sex, preaxial polydactyly and pectoral agenesis; cleft lip without cleft palate.

Direct application of Roundup® to water should be avoided

Glyphosate was used for 3 years in rivers in Washington State (Legal Status of Noxious Weeds³⁵⁹). However, in 1996 the Attorney General of the State of New York Consumer Frauds and Protection Bureau, Environmental Protection Bureau had convicted Monsanto for false advertising with regard to the safety of Roundup® herbicide, including its use in water. Monsanto's claims contradicted the following statements required on the EPA-approved label for Roundup® at the time the claims were made: ENVIRONMENTAL HAZARDS Avoid direct application to any body of water.³⁶⁰

In the US, Benton County's 3-year control of river weeds; was it linked to the fatal birth defect anencephaly?

Washington State has a Noxious Weed Control Board and glyphosate is the main herbicide recommended for noxious weed eradication. Benton County Herbicide treatment started in the Yakima River in 2010 and continued for 3 years without monitoring glyphosate levels in water.³⁶¹ Three Washington Counties (Yakima, Benton and Franklin) sharing the same irrigation water for agriculture, reported a high number of pregnancies resulting in a fatal birth defect, anencephaly.³⁶² The cause was 'a mystery' to state health officials.³⁶³

³⁵⁷ <http://www.ncbi.nlm.nih.gov/pubmed/19013644>

³⁵⁸ <http://www.ncbi.nlm.nih.gov/pubmed/21132229> [Births prevalence of 27 selected congenital anomalies in 7 geographic regions of Argentina]. [Campaña H](#)

³⁵⁹ <http://agr.wa.gov/plantsinsects/weeds/npdespermits/docs/IPMFreshwaterEmergentNoxiousQuarantineListedWeeds.pdf>

³⁶⁰ <http://www.mindfully.org/Pesticide/Monsanto-v-AGNYnov96.htm>

³⁶¹ <http://agr.wa.gov/plantsinsects/weeds/npdespermits/docs/IPMFreshwaterEmergentNoxiousQuarantineListedWeeds.pdf>

³⁶² <http://farmwars.info/?p=11137>

³⁶³ <http://abcnews.go.com/Health/washington-state-health-officials-stumped-high-rate-birth/story?id=19687592>



How glyphosate damages human metabolism by suppressing metabolic pathways

Samsel A and Seneff S (2013) Glyphosate's suppression of Cytochrome P450 enzymes and amino acid biosynthesis by the gut microbiome: Pathways to Modern Diseases.³⁶⁴

Abstract: Glyphosate, the active ingredient in Roundup®, is the most popular herbicide used worldwide. The industry asserts it is minimally toxic to humans, but here we argue otherwise. Residues are found in the main foods of the Western diet, comprised primarily of sugar, corn, soy and wheat. Glyphosate's inhibition of cytochrome P450 (CYP) enzymes is an overlooked component of its toxicity to mammals. CYP enzymes play crucial roles in biology, one of which is to detoxify xenobiotics. Thus, glyphosate enhances the damaging effects of other food borne chemical residues and environmental toxins. Negative impact on the body is insidious and manifests slowly over time as inflammation damages cellular systems throughout the body. Here, we show how interference with CYP enzymes acts synergistically with disruption of the biosynthesis of aromatic amino acids by gut bacteria, as well as impairment in serum sulfate transport. Consequences are most of the diseases and conditions associated with a Western diet, which include gastrointestinal disorders, obesity, diabetes, heart disease, depression, autism, infertility, cancer and Alzheimer's disease. We explain the documented effects of glyphosate and its ability to induce disease, and we show that glyphosate is the "textbook example" of exogenous semiotic entropy: the disruption of homeostasis by environmental toxins.

Glyphosate, pathways to modern diseases II: Celiac sprue and gluten intolerance.³⁶⁵

Samsel A and Seneff S . Glyphosate, pathways to modern diseases II: Celiac sprue and gluten intolerance

Abstract: Celiac disease, and, more generally, gluten intolerance, is a growing problem worldwide, but especially in North America and Europe, where an estimated 5% of the population now suffers from it. Symptoms include nausea, diarrhea, skin rashes, macrocytic anemia and depression. It is a multifactorial disease associated with numerous nutritional deficiencies as well as reproductive issues and increased risk to thyroid disease, kidney failure and cancer. Here, we propose that

³⁶⁴ <http://www.mdpi.com/1099-4300/15/4/1416>

³⁶⁵ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3945755/>

glyphosate, the active ingredient in the herbicide, Roundup[®], is the most important causal factor in this epidemic. Fish exposed to glyphosate develop digestive problems that are reminiscent of celiac disease. Celiac disease is associated with imbalances in gut bacteria that can be fully explained by the known effects of glyphosate on gut bacteria. Characteristics of celiac disease point to impairment in many cytochrome P450 enzymes, which are involved with detoxifying environmental toxins, activating vitamin D3, catabolizing vitamin A, and maintaining bile acid production and sulfate supplies to the gut. Glyphosate is known to inhibit cytochrome P450 enzymes. Deficiencies in iron, cobalt, molybdenum, copper and other rare metals associated with celiac disease can be attributed to glyphosate's strong ability to chelate these elements. Deficiencies in tryptophan, tyrosine, methionine and selenomethionine associated with celiac disease match glyphosate's known depletion of these amino acids. Celiac disease patients have an increased risk to non-Hodgkin's lymphoma, which has also been implicated in glyphosate exposure. Reproductive issues associated with celiac disease, such as infertility, miscarriages, and birth defects, can also be explained by glyphosate. Glyphosate residues in wheat and other crops are likely increasing recently due to the growing practice of crop desiccation just prior to the harvest. We argue that the practice of "ripening" sugar cane with glyphosate may explain the recent surge in kidney failure among agricultural workers in Central America. We conclude with a plea to governments to reconsider policies regarding the safety of glyphosate residues in foods.

Glyphosate, pathways to modern diseases III: Manganese, neurological diseases, and associated pathologies

Samsel A, Seneff S. Glyphosate, pathways to modern diseases III: Manganese, neurological diseases, and associated pathologies. *Surg Neurol Int* 2015; 6:45.³⁶⁶

Abstract: *Manganese (Mn) is an often overlooked but important nutrient, required in small amounts for multiple essential functions in the body. A recent study on cows fed genetically modified Roundup[®]-Ready feed revealed a severe depletion of serum Mn. Glyphosate, the active ingredient in Roundup[®], has also been shown to severely deplete Mn levels in plants. Here, we investigate the impact of Mn on physiology, and its association with gut dysbiosis as well as neuropathologies such as autism, Alzheimer's disease (AD), depression, anxiety syndrome, Parkinson's disease (PD), and prion diseases. Glutamate overexpression in the brain in association with autism, AD, and other neurological diseases can be explained by Mn deficiency. Mn superoxide dismutase protects mitochondria from oxidative damage, and mitochondrial dysfunction is a key feature of autism and Alzheimer's. Chondroitin sulfate synthesis depends on Mn, and its deficiency leads to osteoporosis and osteomalacia. Lactobacillus, depleted in autism, depend critically on Mn for antioxidant protection. Lactobacillus probiotics can treat anxiety, which is a comorbidity of autism and chronic fatigue syndrome. Reduced gut Lactobacillus leads to overgrowth of the pathogen, Salmonella, which is resistant to glyphosate toxicity, and Mn plays a role here as well. Sperm motility depends on Mn, and this may partially explain increased rates of infertility and birth defects. We further reason that, under conditions of adequate Mn in the diet, glyphosate, through its disruption of bile acid homeostasis, ironically promotes toxic accumulation of Mn in the brainstem, leading to conditions such as PD and prion diseases.*

Defra Expert Committee on Pesticide Residues in Food: Monsanto is responsible for humans and animals having glyphosate residues in their bodies: it is in all staple, non-organic foods

The results from monitoring of Pesticide Residues in Food (PRiF) have been published quarterly in the UK since 2000, but pre-harvest application to crops had already been authorised 20 years before. Bread and breakfast cereals are staple foods but there are no maximum residue limits (MRLs) for bread or breakfast cereals. Residues in bread are tested twice a year.

e.g. 2002 3rd Quarter: Comments from PRiF: "Residues of chlormequat, glyphosate and pirimiphos-methyl were found (in bread). These pesticides are commonly used on cereal crops, and residues

³⁶⁶ http://www.surgicalneurologyint.com/temp/SurgNeurolInt6145-4381109_121011.pdf

have been found in other cereal products, therefore these findings are not unexpected. None of the residues found were of concern for consumer health.”

2011 3rd/4th Quarters for Lentils: Comments: “Sixteen samples of lentils contained glyphosate above the MRL. A new higher level of glyphosate is expected to come into force in summer 2012. None of the residues detected in this survey would be above the new proposed MRL.”

When the CRD Head of Regulatory Policy replied on 28/02/2014 to defend the authorisation of glyphosate, he told me that the capability to detect individual pesticides in food had increased from 150 in 2003 to 393 in 2012. He stated: *“In the 2012 Report, although there were a large number of residues found in bread, none of these were at a level to suggest a risk to consumer health.”*

However, he failed to reply to my question as to why EFSA was regularly increasing the Maximum Residue Limits (MRLs) of glyphosate in foods at the request of Monsanto to accommodate their practice of desiccation of crops and to protect their imports into Europe.

The use of glyphosate for desiccation of both barley and wheat was accepted by the brewing and distilling industries in 2007 therefore it is probable that men will have higher glyphosate residues because of the consumption of beer and/or whisky. Many foods imported from the US have GM ingredients and will contain glyphosate (or other herbicide) residues. These include products which are made from corn or soya, such as energy bars, sugar drinks; and fruit or vegetables. Glyphosate is used as a ‘ripeners’ on sugar cane and is usually sprayed by air 6 weeks before harvest. The US still does not require labelling of GM. Animals in the UK are fed with imported GM soya and maize.

Increases in depression and anti-depressant medication

Researchers from the Nuffield Trust and the Health Foundation identified a long-term trend of increasing prescriptions of antidepressants, rising from 15 million items in 1998 to 40 million items in 2012.³⁶⁷

The Health Care Doctors Forgot: Why Ordinary Food Will Be the Future of Medicine

Prof T Colin Campbell also identifies our *“neglect of the remarkable ability of nutrition to promote health and decrease illness.”*³⁶⁸ He quotes Hippocrates: *“Let food be thy Medicine.”* *“Can diet cure disease, and not just prevent it? Scientific evidence is accumulating that diets which emphasize consumption of plants and which avoid meat and dairy products can rapidly reverse common and life-threatening chronic diseases such as diabetes and heart disease. For these and other common diseases research is showing that a diet-based cure is much more effective than current medical treatments which are largely ineffectual, expensive, and plagued by side effects. These important facts about the power of nutrition are not widely known, however. That is because they simultaneously challenge the food industry, the pharmaceutical industry, and the medical profession.”* Professor Campbell also asked why cancer research has stalled.³⁶⁹

The non-mutagenic nutrition effects we observed in our research on cancer development closely resemble the nutrition-based effects known to dramatically reverse other diseases, including advanced coronary heart disease and diabetes (Esselstyn 2014 and Barnard 2009). These nutrition-based effects have been observed as a result of the dietary lifestyle composed of whole plant-based foods without added oil and refined carbohydrates. The benefits are truly remarkable, broad in scope, and surprisingly rapid in response (Campbell and Campbell 2005; Campbell 2013).

Violent Behavior: A Solution in Plain Sight

³⁶⁷ <http://www.theguardian.com/society/2014/may/28/-sp-antidepressant-use-soared-during-recession-uk-study>

³⁶⁸ <http://www.independentsciencenews.org/health/the-healthcare-doctors-forgot-ordinary-food-will-be-the-new-medicine>

³⁶⁹ <https://www.independentsciencenews.org/health/why-cancer-research-has-stalled/>

Why is there an increasing incidence in unsociable behaviour, disorder, aggression, gun crime, and brutality in the UK and the US? This paper by Sylvia Onusic, PhD, CNS, LDN, seeks reasons for the increase in violent behaviour in America, especially among teenagers. She also identifies malnutrition, vitamin and micronutrient deficiency as potent causes of aberrant behaviour, crime and the spectrum of autistic diseases. She says: “*Some children have been corrected by a proper diet free of junk food.*”³⁷⁰ These are precisely the effects of exposure to glyphosate and other chemicals.

LOSS OF BIODIVERSITY AND CHEMICALS IN THE ENVIRONMENT: WHY HAVE NO REGULATORS OR GOVERNMENTS MEASURED GLYPHOSATE AND THE NEONICOTINOID INSECTICIDES?

EFSA recommended on 12/11/2015 that the active substance glyphosate registration be renewed³⁷¹

The conclusions of the European Food Safety Authority (EFSA), following the peer review of the initial risk assessments carried out by the competent authority of the rapporteur Member State Germany, for the pesticide active substance glyphosate are reported. However, EFSA admits that the genotoxic effects observed in some glyphosate-based formulations are related to the other constituents or “co-formulants”. However, it is mostly commercial products that are sold. “Member States are responsible for evaluating each plant protection product that is marketed in their territories.”

The Rapporteur Member State BfR concluded that glyphosate is not harmful to the environment

Brief summary of the German Federal Institute of Risk Assessment (BfR) Renewal Assessment Report evaluation of peer-reviewed literature regarding the ecotoxicity of Glyphosate.³⁷² It broadly concluded that glyphosate is not harmful to the environment.

Aquatic organisms: Summary page 64. “*It was not possible to distinguish between the effects of the technical glyphosate and the surface active substance added to the commercial formulation.*”

Aquatic vertebrates: Summary page 68. “*No report of statistical power of test glyphosate: most on commercial formulations.*”

Effects on amphibians: Summary page 95. “*Does not resemble the lead formulation for EU assessment of renewal approval of glyphosate as an active substance.*”

Terrestrial arthropods including bees: Summary page 113 “*Summary of relevant literature in 31 publications: none of the publications acceptable for risk assessment.*”

Effects on earthworms: Page 123. Twenty one publications submitted. Summary of relevant literature in earthworms: “*Herbicide application did not directly affect movement or reproduction. The outcome of risk assessment did not change.*”

Effects on soil non-target micro-organisms: Page 143. “*No negative effects at the moment, but should be included in future risk assessments.*”

Other non-target: flora and fauna: 87 papers. See elsewhere. 2.6.7.2.

Science requires that measurements are made

The CRD, EFSA, US EPA and the AVPMA claim they are doing ‘*sound science*’ but none of these regulatory bodies have made measurements of either glyphosate or the neonicotinoid insecticides in water or soil. Dr Henk Tennekes was the first independent researcher to recognize the extreme toxicity of low levels of systemic neonicotinoid insecticides.^{373,374} They cause a virtually irreversible

³⁷⁰ <http://www.westonaprice.org/environmental-toxins/violent-behavior-a-solution-in-plain-sight/pdf>

³⁷¹ <http://www.efsa.europa.eu/de/efsajournal/pub/4302>

³⁷² Glyphosate Renewal Assessment Report Vol 3 Annex B9. Evaluation of peer-reviewed literature regarding ecotoxicity

³⁷³ <http://www.ncbi.nlm.nih.gov/pubmed/20803795>

³⁷⁴ Tennekes, H.A. *The Systemic Insecticides: a Disaster in the Making* (2010).

blockage of postsynaptic nicotinic acetylcholine receptors (nAChRs) in the central nervous system of insects. He found the damage is cumulative, and with more exposure more receptors are blocked. He proposed that there may be no safe level of exposure. The Dutch water boards had been measuring imidacloprid since 2004 and found there was major contamination of Dutch surface water, particularly in the western part of the country. Imidacloprid is stable to breakdown in water and at neutral pH has a half-life of 355 days. Tennekes reported declines in invertebrates and insect-dependent birds in Holland and throughout Europe. In December 2010, I wrote to UK ministers, civil servants and NGOs and later to regulatory agencies around the world with this information. Replies were suspiciously identical: “*There is no evidence that they are harmful to honey bees, if correctly used*”. Not one of the CRD, EFSA, the German Rapporteur Member State (RMS), the US EPA or the APVMA mentioned water contamination. In fact the Chairman of the UK Environment Agency refused my request to measure neonicotinoids or glyphosate in water. Where levels have been measured, disturbing damage to the ecosystem has been reported.

A biological desert: Correlation of loss of biodiversity with glyphosate levels on an Iowa farm.

The state of Iowa was just one area in which the USGS reported widespread contamination with glyphosate. Grundy County, Iowa was where Craig Childs spent a long weekend in a monoculture of GM “Roundup Ready” corn looking for wildlife.³⁷⁵ “In this cornfield, I had come to a different kind of planetary evolution. I listened and heard nothing, no bird no click of an insect ... Mr Owen was the farmer who had given us permission to backpack across his cornfields. He grew a combination of DuPont and Monsanto stock. We were in DuPont now. It didn’t look any different to me.” In contrast, “Yet, 100 years ago, these same fields, these prairies, were home to 300 species of plants, 60 mammals, 300 birds, hundreds and hundreds of insects. This soil was the richest, the loamiest in the state. And now, in these patches, there is almost literally nothing but one kind of living thing. We’ve erased everything else. There’s something strange about a farm that intentionally creates a biological desert to produce food for one species: us. It’s efficient, yes. But it’s so efficient that the ants are missing, the bees are missing, and even the birds stay away. Something’s not right here. Our cornfields are too quiet”.³⁷⁶

Emerging pathogens as threats to animal and plant health

Outbreaks of infectious diseases amongst species of wildlife around the world (such as amphibians, honey bees and wild bees, fish, birds and bats) have occurred over the last 25 years. Since the late 1990’s scientists have written in increasingly desperate tones. In 2012 there were two papers in *Nature*: “Biodiversity loss and the impact on humanity”³⁷⁷ and “Emerging fungal threats to animal, plant and ecosystem health”.³⁷⁸ Authors of this last review had appealed to scientists urgently to find ‘*the elusive magic bullet*.’ Only one paper from California dared to mention pesticides. Davidson *et al.*³⁷⁹ reported in 2002 spatial patterns of decline for four California ranid frogs and matched the declines with the distribution of agricultural lands (based on USGS land use maps and key predominant wind directions based on California Air Resources streamline wind maps). The authors stated that “*In California, the transport and deposition of pesticides from the agriculturally intensive Central Valley to the adjacent Sierra Nevada is well documented, and pesticides have been found in the bodies of Sierra frogs.*” The widespread use on agricultural crops of the systemic neonicotinoid insecticides³⁸⁰ and the herbicide glyphosate,³⁸¹ both of which cause immune suppression, make species vulnerable to emerging infectious pathogens, driving large-scale amphibian extinctions.

³⁷⁵ Childs, C. *Apocalyptic Planet. Field Guide to the Future of the Earth*, ch. 6, Species Vanish, p. 187. New York: Vintage Books (2013)

³⁷⁶ <http://www.npr.org/blogs/kruilwich/2012/11/29/166156242/cornstalks-everywhere-but-nothing-else-not-even-a-bee>

³⁷⁷ http://www.nature.com/nature/journal/v486/n7401/full/nature11148.html?WT.ec_id=NATURE-20120607

³⁷⁸ <http://www.ncbi.nlm.nih.gov/pubmed/22498624>

³⁷⁹ <http://onlinelibrary.wiley.com/doi/10.1046/j.1523-1739.2002.01030.x/abstract>

³⁸⁰ http://www.boerenlandvogels.nl/sites/default/files/JEIT%20Immune%20Suppression%20pdf_6.pdf

³⁸¹ http://www.fs.fed.us/foresthealth/pesticide/pdfs/seratr01_43_08_04.pdf

Chytrid fungus has wiped out amphibian populations over five continents.

Chytrid fungus, *Batrachochytrium dendrobatidis* has wiped out amphibian populations over five continents. A spokesman for IUCN said: *"The IUCN Red List currently considers 31% of the earth's amphibians are threatened with extinction...it's thought that 159 species have vanished forever in recent years."* Amphibians, particularly tadpoles, are considered to be environmental indicators of indirect ecosystem effects because of their unique niche at the boundary of the aquatic-terrestrial ecosystems as well as their sensitivity to pollutants. While tadpoles feed on periphyton, adult amphibians are strictly insectivorous. Amphibians were the first group of vertebrates to be affected by the epidemics of diseases caused by uncommon pathogens. Joseph Mendelson an amphibian taxonomist wrote in 2011.³⁸² *"The reality of amphibian declines and extinctions has shifted the ecological baseline in so many ecosystems, that an entire generation of biologists is conducting their research in a framework that has been very recently remodelled. I am a taxonomist and I have seen my career vacillate between the thrill of discovering new species and the chill of tracking extinction events—including species that I described."*

Birth defects in animals in Montana correlates with glyphosate usage on crops and with birth defects in humans

A recent study by Hoy *et al.* found alarming increases in congenital malformations in wildlife in Montana that Hoy has been documenting for the past 19 years. Similar birth defects have occurred in humans in the USA. Their graphs illustrating human disease patterns over the twelve-year period correlate remarkably well with the rate of glyphosate usage on corn, soy and wheat crops, which has increased due to "Roundup Ready" crops. While the animals' exposure to the herbicide is through food, water and air, the authors believe that human exposure is predominantly through food, as the majority of the population does not reside near agricultural fields and forests. They conclude: "Our over-reliance on chemicals in agriculture is causing irreparable harm to all beings on this planet, including the planet herself. Most of these chemicals are known to cause illness, and they have likely been causing illnesses for many years. But until recently, the herbicides have never been sprayed directly on food crops, and never in this massive quantity. We must find another way".³⁸³

Many independent sources have measured glyphosate in the environment

In 2011, the US Geological Survey (USGS) published the first report on the ambient levels of glyphosate, the most widely used herbicide in the United States, and its major degradation product, aminomethylphosphonic acid (AMPA), in air and rain in Mississippi and Iowa in two growing seasons.³⁸⁴ In 2013, scientists in Argentina did the same. *"Agricultural production is fundamentally based on a technological package that combines no-till and glyphosate in the cultivation of transgenic crops. Transgenic crops (soybean, maize and cotton) occupy 23 million hectares. This means that glyphosate is the most employed herbicide in the country, where 180–200 million liters are applied every year."*³⁸⁵ Another report from the USGS in 2014: *"The most comprehensive research to date on environmental glyphosate levels exposes the widespread contamination of soil and water in the US, as well as its water treatment system. Looking at a wide range of geographical locations, researchers from the US Geological Survey (USGS) analysed 3,732 water and sediment samples and 1,081 quality assurance samples collected between 2001 and 2010 from 38 states in the US and the district of Colombia. They found glyphosate in 39.4 % of samples (1,470 out of 3,732) and its metabolite aminomethylphosphonic acid (AMPA) in 55 % of samples. They concluded that*

³⁸² http://nationalzoo.si.edu/support/volunteer/documents/HR_Mar2011_JoeM_proofs.pdf

³⁸³ <http://www.esciencecentral.org/journals/the-high-cost-of-pesticides-human-and-animal-diseases-2375-446X-1000132.php?aid=56471>

³⁸⁴ <http://www.ncbi.nlm.nih.gov/pubmed/21128261>

³⁸⁵ <http://www.ncbi.nlm.nih.gov/pubmed/23849835>

*Glyphosate and its degradation product AMPA occur frequently and widely in U.S. soils, surface water, groundwater, and precipitation.*³⁸⁶

In South Wales, “Roundup” sprayed on Japanese knotweed from April to August has caused rapid declines of biodiversity in our nature reserve³⁸⁷ and in the surrounding areas since 2010. Glyphosate was present in river and tap water at concentrations of the order of that found in a study in 2013, which showed that breast cancer cell proliferation is accelerated by glyphosate in extremely low concentrations: “The present study used pure glyphosate substance at log intervals from 10^{-12} to 10^{-6} M. These concentrations are in a crucial range that correlate to the potential biological levels at ppt (parts per trillion) to ppb (parts per billion) that have been reported in epidemiological studies”.³⁸⁸

In the UK, according to the Cancer Research UK website, the incidence of breast cancer almost doubled between 1975 and 2011.³⁸⁹ The Chemicals Regulation Directorate refused our appeal to instruct the local council and their contractors, Complete Weed Control, to stop spraying “Roundup” because Japanese knotweed had developed resistance and become a super-weed.

Wildlife Law: Control of Invasive Non-native Species³⁹⁰ from the Law Commission

“On 11 February 2014, we published our final report, Wildlife Law: Control of Invasive Non-native Species. This is the first item to be delivered from the full project. This element of the project was brought forward at the request of Defra and the Welsh Government to enable them to consider whether to introduce early legislation.”

If landowners do not comply, this new law will give the relevant body (Defra, the Welsh Government and statutory bodies such as the Environment Agency, Forestry Commission, Natural England and Natural Resources Wales) the power to enter land for the purposes of species control. Japanese knotweed is among the plant species specified. But the law appears to be coy about specifying the method of eradication.

The systemic neonicotinoid insecticides; a disaster in the making

On December 3rd 2010, we sent the CRD and Defra information (and later a pdf link) to Dr Henk Tennekes’ book. Dr Tennekes, an independent Dutch toxicologist, first warned of the dangers of the systemic neonicotinoid insecticides to arthropods in a paper in *Toxicology*³⁹¹ and in his book: *The systemic neonicotinoid insecticides: A disaster in the making*. Dr Tennekes says that his book: “... catalogues a tragedy of monumental proportions regarding the loss of invertebrates and subsequent losses of the insect-feeding (invertebrate-dependent) bird populations in all environments in the Netherlands. The disappearance can be related to agriculture in general, and to the neonicotinoid insecticide imidacloprid in particular, which is a major contaminant of Dutch surface water since 2004.” The relationship exists because of crucial (and catastrophic) disadvantages of the neonicotinoid insecticides: the damage to the central nervous system of insects is irreversible and cumulative. Tennekes showed that there is no safe level of exposure, and even minute quantities can have devastating effects in the long term. They leach into groundwater and contaminate surface water and persist in soil and water, chronically exposing aquatic and terrestrial organisms to these insecticides. “So, what, in effect, is happening is that these insecticides are creating a toxic landscape, in which many beneficial organisms are killed off.” Tennekes and Sánchez-Bayo, in a more recent paper, demonstrated that chemicals that bind irreversibly to specific receptors

³⁸⁶ <http://onlinelibrary.wiley.com/doi/10.1111/jawr.2014.50.issue-2/issuetoc>

³⁸⁷ http://www.i-sis.org.uk/How_Roundup_Poisoned_My_Nature_Reserve.php

³⁸⁸ <http://www.ncbi.nlm.nih.gov/pubmed/23756170>

³⁸⁹ <http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/breast-cancer/incidenceinvasive#heading-Two>

³⁹⁰ <http://lawcommission.justice.gov.uk/publications/2612.htm>

³⁹¹ Tennekes HA. The significance of the Druckrey-Küpfmüller equation for risk assessment – The toxicity of neonicotinoid insecticides to arthropods is reinforced by exposure time. *Toxicology* 2010; 276(1):1-4. <http://www.ncbi.nlm.nih.gov/pubmed/20803795>

(neonicotinoids, genotoxic carcinogens and some metalloids) will produce toxic effects in a time-dependent manner, no matter how low the level of exposure.³⁹²

Many independent scientists have measured chemicals and correlated them with biodiversity loss

It has been shown that macrofauna abundance drops sharply between 13 and 67 ng L⁻¹ of imidacloprid.³⁹³ The team combined 8 years of monitoring data on imidacloprid in surface water and 8 years of monitoring data on macrofauna abundance. The water quality standards applied in the Netherlands to achieve ecological protection are not met in many parts of the country, and especially in agricultural areas with greenhouses and crops like bulbs, where concentrations up to hundreds of µg L⁻¹ imidacloprid are being found in the surface water. *"We are risking far too much to combat a few insect pests that might threaten agriculture,"* said Dr Jeroen van der Sluijs, the senior member of the team based at Utrecht University. *"This substance should be phased out internationally as soon as possible. The pollution was so bad in some places that the ditch water in fields could have been used as an effective pesticide"* he said. *"As well as killing mayflies, midges and molluscs, the pollution could have a knock-on effect on birds such as swallows that rely on flying insects for food,"* he added. Half the 20 000 tonnes of the imidacloprid produced each year is not affected by the EU ban, because it is used not to treat crops, but to combat fleas and other pests in cattle, dogs and cats; much of it ends up in surface water.

The American Bird Conservancy (ABC) Report correlates measurements with the effects on birds

The ABC produced a report on neonicotinoids and birds. They had commissioned world-renowned environmental toxicologist Dr Pierre Mineau to conduct the research. Cynthia Palmer, co-author of the report is an environmental lawyer and Pesticides Program Manager for ABC. The authors called for a ban on the use of the neonicotinoid insecticides as seed treatments and for the suspension of all applications pending an independent review of the products' effects on birds, terrestrial and aquatic invertebrates, and other wildlife. [The Report has been updated to 2015³⁹⁴ to incorporate more measurement data, but the majority of quotations remain the same.]

April 2013 I sent this document to the chairman of the UK Environment Agency (EA) asking him to read it and instruct the EA to measure neonicotinoids and glyphosate in water, but he declined. Dr Jo Kennedy, confirmed that the UK Environment Agency **could** measure neonicotinoids (although the limit of detection of the GCMS scan is approx, 0.5µg/l) but were not doing so, because it was not required by the European Water Frame Directive].

Some of the salient findings of the report are:

"It is astonishing that EPA would allow a pesticide to be used in hundreds of products without ever requiring the registrant to develop the tools needed to diagnose poisoned wildlife. It would be relatively simple to create a binding assay for the neural receptor which is affected by this class of insecticides," said Dr Mineau. The ABC report calls on EPA to require that registrants of acutely toxic pesticides develop the tools necessary to diagnose poisoned birds and other wildlife.

Page 4: *A single corn kernel coated with a neonicotinoid can kill a songbird. Even a tiny grain of wheat or canola treated with the oldest neonicotinoid, imidacloprid, can poison a bird. As little as 1/10th of a corn seed per day during egg-laying season is all that is needed to affect reproduction with any of the neonicotinoids registered to date.*

Page 5: *It looks as if the USEPA and other regulatory agencies consistently approved registrations despite their own scientists' repeated and ever-growing concerns. It is relevant to ask why we conduct scientific evaluations of products if those evaluations have little or no bearing on the registration decisions that are made, and when staff scientists warning of 'major risk concerns' appear to be ignored.*

³⁹² <http://www.farmlandbirds.net/en/content/human-health-and-global-biodiversity-lies-hands-pesticides-industry>

³⁹³ <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0062374>

³⁹⁴ http://abcbirds.org/wp-content/uploads/2015/05/Neonic_FINAL.pdf

Page 7: *Of particular concern to birds are those compounds that are used as seed treatments, primarily imidacloprid, clothianidin, thiamethoxam and acetamiprid.*

Page 8: *"Impacts from the neonicotinoids may very well be further afield than the arable area on which they are used, and many of those impacts may be mediated through the aquatic environment"* Dr Mineau says that: *"for imidacloprid, we believe that a scientifically defensible reference level (a water concentration at which undesirable effects are likely to be seen in reasonably sensitive species) for acute invertebrate effects (following short term exposure) is approximately 0.2 µg/l. European regulators acknowledge that acute effects are likely at levels exceeding 0.5 µg/l. Similarly, a reasonable reference level for effects following chronic exposure is at least an order of magnitude lower, or between 0.01 and 0.03 µg/l."*

Page 9: *"It is clear that we are witnessing contamination of the aquatic environment at levels that will affect aquatic food chains. This has a potential to affect consumers of those aquatic resources, be they birds, fish or amphibians."*

Examples given in the paper by Chagnon *et al.*³⁹⁵ demonstrate evidence of the negative impacts of systemic insecticides on decomposition, nutrient cycling, soil respiration and invertebrate populations valued by humans. Invertebrates, particularly earthworms which are important for soil processes, wild and domestic insect pollinators which are important for plant and crop production, and several freshwater taxa which are involved in aquatic nutrient cycling, were all found to be highly susceptible to lethal and sublethal effects of neonicotinoids at environmentally relevant concentrations. Environment Canada has shown that clothianidin was the most persistent neonicotinoid residue and was present in wetlands in agricultural fields as a result of either snowmelt run-off or other transport mechanisms. Clothianidin residues occurred primarily near fields where canola had been seeded the previous year, because it is very long acting.³⁹⁶ Neonicotinoid insecticides have, furthermore, come under scrutiny for their potential unintended effects on non-target organisms. Residues of clothianidin and thiamethoxam were detected during and after planting maize, outside the fields and in conservation areas. They may move off target by wind erosion of contaminated soil.³⁹⁷

Another study sampled water in 136 wetlands in spring 2012, summer 2012, fall 2012 and spring 2013.³⁹⁸ Prior to seeding, 36% of wetlands contained at least one neonicotinoid, 62% in summer 2012, 16% in fall, but increased to 91% spring 2013 after ice-off. Wetlands situated in barley, canola and oat fields consistently contained higher mean concentrations of neonicotinoids than grasslands. Distribution maps indicate neonicotinoid use is increasing and becoming more widespread with concerns for environmental loading. The reported concentrations of neonicotinoids in surface waters from 29 studies in 9 countries worldwide in tandem with published data on their acute and chronic toxicity to 49 species of aquatic insects and crustaceans spanning 12 invertebrate orders is synthesized to indicate the current state of knowledge.³⁹⁹ Strong evidence exists that waterborne neonicotinoid exposures are frequent and long-term; levels are 0.13 µg L⁻¹ (geometric mean) and 0.63 µg L⁻¹ (maximum). Overall, neonicotinoids can exert adverse effects on survival, growth, emergence, mobility and behaviour of many sensitive aquatic invertebrate taxa at concentrations at or below 1 µg L⁻¹ under acute exposure, and 0.1 µg L⁻¹ for chronic exposure.

There is a wide range of sensitivities of aquatic invertebrates to neonicotinoids. *Daphnia magna*, the standard test species, appears to be very tolerant. However the orders Ephemeroptera (mayfly), Trichoptera (caddis fly) and Diptera (midge) appear to be the most sensitive species, of the order of

³⁹⁵ <http://link.springer.com/article/10.1007%2Fs11356-014-3277-x#/page-1>

³⁹⁶ http://www.traceorganic.com/2013/presentations/JBailey%202013_WCTOW.pdf

³⁹⁷ <http://www.ncbi.nlm.nih.gov/pubmed/25710560>

³⁹⁸ <http://www.ncbi.nlm.nih.gov/pubmed/24671127>

³⁹⁹ <http://www.ncbi.nlm.nih.gov/pubmed/25454246>

10 000–100 000 times more sensitive than *D. magna*. These three species are critical for supporting numerous aquatic and terrestrial food webs. Developed to replace organophosphate and carbamate insecticides, neonicotinoids are structurally similar to nicotine. The three main neonicotinoid insecticides, imidacloprid, clothianidin and thiamethoxam, are being evaluated by Health Canada's Pest Management Regulatory Agency (PMRA). The Canadian interim water quality guideline for imidacloprid is 0.23 µg L⁻¹ but there is currently insufficient use, fate and toxicological information available to establish guidelines for clothianidin and thiamethoxam. Based on concentrations of neonicotinoids reported in surface waters in Canada and globally, there is potential for aquatic invertebrates to be negatively impacted by neonicotinoids.⁴⁰⁰ The current methods for measuring neonicotinoids are inadequate for trace measurements and passive sampling methods are not available⁴⁰¹ so the authors described a multi-residue analytical method for neonicotinoids in water. The limits of quantitation were in the range 0.6–1.0 ng for all compounds. Residues of five compounds were found in a survey around Sydney.

The American Bird Conservancy even found neonicotinoids in Congress cafeteria food!⁴⁰² In two rounds of testing—the first in January and the second in May of 2015—nearly all Congressional cafeteria food tested positive for one or more neonicotinoid insecticide residues. Sixty out of a total of 66 food samples, or 91%, tested positive for the chemicals. Forty-seven (or 71%) of the foods had two or more neonicotinoids. Many independent scientists have demonstrated that the neonicotinoid insecticides have effects on the mammalian brain, particularly that of the foetus. In 2000, Tomiwaza *et al.* showed that neonicotinoids acted on mammalian nicotinic acetylcholine receptors as well as those of insects, but considered that the selective nature of its binding (i.e. less affinity than in insects) made it safe for human exposure.⁴⁰³ However, they are long-acting and are now widespread in the environment. Clothianidin, for example, has a half-life in soil of up to 1386 days so it accumulates in the soil, yet farmers apply neonicotinoids blindly the following year. Li *et al.* obtained preparations of human neonicotinoid acetylcholine receptors and found that both chemicals had effects on human receptors, but imidacloprid more so than clothianidin.⁴⁰⁴ Abou-Donia *et al.* showed that gestational exposure to a single large, nonlethal dose of imidacloprid in rats caused significant neurobehavioral deficits and an increased expression of glial fibrillary acidic protein in several brain regions of the offspring on postnatal day 30, corresponding to human early adolescent age. These changes may have long-term adverse effects in the offspring.⁴⁰⁵ Kimura-Kuroda *et al.* found nicotine-like effects of the neonicotinoid insecticides acetamiprid and imidacloprid on the cerebellar neurons of neonatal rats.⁴⁰⁶

Tennekes and Sánchez-Bayo demonstrated that chemicals binding irreversibly to specific receptors (neonicotinoids, genotoxic carcinogens and some metals) will produce toxic effects in a time-dependent manner, no matter how low the level of exposure.⁴⁰⁷ Neonicotinoid insecticides cause damage to the central nervous system of insects that is virtually irreversible and cumulative. There is apparently no safe level of exposure; even minute quantities can have severe effects in the long term. During pregnancy, when the foetal brain is the size of an insect, exposure to neonicotinoids may cause similar neurological defects.

Loss of biodiversity also correlated with systemic neonicotinoids in streams in the USA

⁴⁰⁰ <http://www.ncbi.nlm.nih.gov/pubmed/25461043>

⁴⁰¹ <http://europepmc.org/abstract/MED/24296028>

⁴⁰² http://abcbirds.org/wp-content/uploads/2015/07/CongressionalDiningHallReport_July2015.pdf

⁴⁰³ <http://www.ncbi.nlm.nih.gov/pubmed/11312774>

⁴⁰⁴ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3668458/>

⁴⁰⁵ <http://www.tandfonline.com/doi/abs/10.1080/15287390701613140>

⁴⁰⁶ <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0032432>

⁴⁰⁷ <http://www.omicsonline.org/2161-0525/2161-0525-S4-001.php?%252520aid=2840>

Widespread occurrence of neonicotinoid insecticides in streams in a high corn- and soybean-producing region in the USA was reported and chemicals were persistent.⁴⁰⁸ Pulses of elevated neonicotinoid insecticide concentrations were associated with rainfall events during and shortly after crop planting, which is consistent with the spring flushing of herbicides that has been documented in Midwestern US streams. The insecticides also were detected prior to their first use during the growing season, persisting from use during previous growing seasons. Based on correlations between loss of butterflies and moths and increases in agricultural pesticides over the same years, the chief of the Wildlife Refuges decided to ban the use of GMOs and neonicotinoids from the refuges by January 2016.⁴⁰⁹

US populations of a lepidopteran, the migrant Monarch Butterfly, have declined by 90%

The results of mathematic modelling by EFSA GMO panel⁴¹⁰ appear to bear no relationship to what happens in the field: US populations of a 'real' lepidopteran, the migrant Monarch Butterfly, have declined by 90%. In the last 20 years, the populations of Monarch Butterflies in the eastern US have declined by 90 percent.⁴¹¹ With the introduction of genetically-modified crops like [Roundup®-Ready corn and soy](#) that are resistant to traditional herbicides, farmers have begun to spray more and more Roundup®--the Monsanto-made chemical-- over wider and wider areas, resulting in the loss of milkweed, the only plant upon which they lay eggs and their larvae feed.

In February 2015 the US Center for Food Safety produced an 88-page Report: *Monarchs in peril; Herbicide-Resistant Crops and the decline of Monarch Butterflies in North America*.⁴¹² "Unlike many other weed killers, once absorbed it (glyphosate) is translocated (moved internally) to root tissue, where it kills milkweed at the root and so prevents regeneration. The increasingly common practice of growing Roundup Ready crops continuously on the same fields means that milkweed is exposed to glyphosate every year, with no opportunity to recover. In 1999, common milkweed was found in half of corn and soybean fields, but only 8% of them a decade later." Another paper has shown that clothianidin, a long-acting systemic neonicotinoid insecticide, contributes to the decline of Monarch Butterflies.⁴¹³

ARE PESTICIDES ASSOCIATED WITH CORAL BLEACHING AND AQUATIC INVERTEBRATE DECLINES?

Australia-- The 27-year decline of coral cover on the Great Barrier Reef and its causes⁴¹⁴

Extracts: Based on the world's most extensive time series data on reef condition (2,258 surveys of 214 reefs over 1985–2012), we show a major decline in coral cover from 28.0% to 13.8% ($0.53\% \text{ y}^{-1}$), a loss of 50.7% of initial coral cover. Tropical cyclones, coral predation by crown-of-thorns starfish (COTS), and coral bleaching accounted for 48%, 42%, and 10% of the respective estimated losses amounting to $3.38\% \text{ y}^{-1}$ mortality rate. Importantly, the relatively pristine northern region showed no overall decline. Thus, reducing COTS populations, by improving water quality and developing alternative control measures, could prevent further coral decline and improve the outlook for the Great Barrier Reef. Such strategies can, however, only be successful if climatic conditions are stabilized, as losses due to bleaching and cyclones will otherwise increase.

Glyphosate persistence in samples of seawater extracted from the Great Barrier Reef⁴¹⁵

Extracts: Glyphosate is one of the most widely applied herbicides globally but its persistence in seawater has not been reported. Here we quantify the biodegradation of glyphosate using standard "simulation" flask tests with native bacterial populations and coastal seawater from the Great

⁴⁰⁸ <http://ca.water.usgs.gov/pubs/2014/HladikKolpinKuivila2014.pdf>

⁴⁰⁹ http://www.centerforfoodsafety.org/files/agricultural-practices-in-wildlife-management_20849.pdf

⁴¹⁰ <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2664.2011.02083.x/pdf>

⁴¹¹ <http://www.newsweek.com/monarch-butterflies-have-declined-90-conservationists-look-for-extra-protection-267094>

⁴¹² http://www.centerforfoodsafety.org/files/cfs-monarch-report_2-4-15_design_05341.pdf

⁴¹³ <https://www.sdstate.edu/nrm/publications/upload/Pecenka-and-Lundgren-2015.pdf>

⁴¹⁴ <http://www.pnas.org/content/109/44/17995.full>

⁴¹⁵ <http://www.sciencedirect.com/science/article/pii/S0025326X14000228>

Barrier Reef. The half-life for glyphosate at 25 °C in low light was 47 days, extending to 267 days in the dark at 25 °C and 315 days in the dark at 31 °C, which is the longest persistence reported for this herbicide. AMPA, the microbial transformation product of glyphosate, was detected under all conditions, confirming that degradation was mediated by the native microbial community. This study demonstrates glyphosate is moderately persistent in the marine water under low light conditions and is highly persistent in the dark. Little degradation would be expected during flood plumes in the tropics, which could potentially deliver dissolved and sediment-bound glyphosate far from shore. **Glyphosate has not often been included in regular monitoring programs as the stand-alone analytical methods are often cost-prohibitive, resulting in a long-term deficiency in global datasets.**

Advice for Cane Sugar farmers (sugarresearch.com.au) is the first organisation that has admitted that herbicides are being detected in the Great Barrier Reef Lagoon (GBR)⁴¹⁶

They state that: “Products of major concern are atrazine, ametryn, hexazinone and diuron (all Group C or PSII herbicides). These products and others are being detected in waterways and in the Great Barrier Reef Lagoon (GBR)” Page 108. Even though glyphosate is one of the most widely applied herbicides globally, it is evident that very few studies had been done because it is expensive. Herbicides such as glyphosate, atrazine and dicamba were recommended by sugarresearch.com.au (2013) for weed control; pre-emergent or post-emergent, sometimes by aerial spraying. Aerial spraying is commonly used for the control of vines at the out-of-hand stage or in the mature crop, particularly in the areas when extreme crop lodging occurs. *“These products and others are being detected in waterways and in the Great Barrier Reef Lagoon (GBR).”... “Control of weed growth in tidal drains should be carried out in accordance with the guidelines in the SmartCane Riparian and Wetlands Area practice booklet or with an individual permit. All other watercourses in Queensland are protected under the Water Resources Act 1989.”*

Instructions for using Roundup Advance AG Herbicide by Monsanto include: *“Protection of Wildlife, Fish, Crustacea and Environment. Do not contaminate dam, river or stream with the product.”*⁴¹⁷

Clothianidin (Sumitomo Shield a systemic neonicotinoid insecticide) has also been granted registration by APVMA for use on very low-lying sugar cane plantations. Instructions: PROTECTION OF WILDLIFE, FISH, CRUSTACEANS AND ENVIRONMENT⁴¹⁸

*DO NOT apply under weather conditions, or from spraying equipment, that may cause spray drift onto nearby or adjacent areas, particularly wetlands, water-bodies or watercourses. **This product is highly toxic to aquatic invertebrates.** DO NOT contaminate streams, rivers or waterways with the chemical or used containers. DO NOT apply when there are aquatic and wetland areas including aquacultural ponds or surface streams and rivers downwind from the application area and within the mandatory no- spray zone shown in table 1.*

Two pieces of vital evidence that the devastating deterioration in the Great Barrier Reef is man-made and not due to natural disasters came from two papers:

- *“Importantly, the relatively pristine northern region showed no overall decline.”*⁴¹⁹
- *“Glyphosate has not often been included in regular monitoring programs as the stand-alone analytical methods are often cost-prohibitive, resulting in a long-term deficiency in global datasets.”*⁴²⁰

⁴¹⁶

<http://www.sugarresearch.com.au/content/FlippingBooks/Sugarcane%20Advisors%20Information%20Kit/files/assets/common/downloads/Sugarcane%20Advisor%20Information%20Kit%20FINAL.pdf>

⁴¹⁷ <http://websvr.infopest.com.au/LabelRouter?LabelType=L&ProductCode=70096>

⁴¹⁸ http://www.sumitomo-chem.com.au/sites/default/files/pdf/labels/shield_label.pdf

⁴¹⁹ <http://www.pnas.org/content/109/44/17995.full>

⁴²⁰ <http://www.sciencedirect.com/science/article/pii/S0025326X14000228>

Flooding causes run-off of pesticides from farming areas

Two further ecological disasters have occurred down the Queensland Coast after the floods in December 2010 and January 2011. In July 2011 *“the northern coast of Queensland has become littered with sick and dying turtles and dugongs (sea cows).”* It was attributed to run-off of nutrients into the ocean *“potentially killing the sea grass that both turtles and dugongs feed on.”*⁴²¹

Hawaii to experience worst-ever coral bleaching due to high ocean temperatures

Warmer-than-normal ocean temperatures around Hawaii this year will likely lead to the worst coral bleaching the islands have ever seen, scientists said.⁴²² Many corals are only just recovering from last year’s bleaching, which occurs when warm waters prompt coral to expel the algae they rely on for food, said Ruth Gates, the director of the Hawaii Institute of Marine Biology. The phenomenon is called bleaching because coral lose their color when they push out algae.

The island chain experienced a mass bleaching event in 1996, and another one last year. This year, ocean temperatures around Hawaii are about 3F to 6F warmer than normal, said Chris Brenchley, meteorologist for the US National Weather Service (NWS) in Honolulu.

Bleaching makes coral more susceptible to disease and increases the risk they will die. This is a troubling for fish and other species that spawn and live in coral reefs. It is also a concern for Hawaii’s tourism-dependent economy.

Birth defects and GMOs in Hawaii: Pesticides in paradise

Carla Nelson, Californian pediatrician says that in Waimea, there have been at least nine babies born with congenital cardiac malformations in five years; that’s more than 10 times the national rate, according to analysis by local doctors. They find themselves in the eye of a storm swirling for the past three years around the Hawaiian archipelago over whether a major cash crop on four of the six main islands, corn that’s been genetically modified to resist pesticides, is a source of prosperity, as the companies claim – or of birth defects and illnesses, as the doctors and many others suspect.

Gastroschisis: a major congenital defect of the abdominal wall

Sidney Johnson, a pediatric surgeon at the Kapiolani Medical Center for Women and Children who oversees all children born in Hawaii with major birth defects and operates on many, says he’s been thinking about pesticides a lot lately. The reason: he’s noticed that the number of babies born here with their abdominal organs outside, a rare condition known as gastroschisis, has grown from three a year in the 1980s to about a dozen now.

Summary of Center for Food Safety Pesticide Report for Hawaii: Agrochemical corporations have bought land on Hawaii for intensive testing of GE Crops which are not relevant to local needs

GENETICALLY ENGINEERED (GE) CROPS IN HAWAI’I (SECTION 3)

Hawai’i leads the nation in GE crop field trials, with tests on 1,141 sites in 2014 alone, representing a far higher density of field tests than on larger mainland states (3.1).

The majority of GE crops tested in Hawai’i are corn (67%) or soybeans (24%), while virtually no GE crops relevant to Hawai’i’s food needs are being tested (3.2).

The most commonly tested GE “trait” is herbicide-resistance (82% of field releases over the past two years), which permits heavier and more frequent spraying of herbicides than is otherwise possible (3.2 & 3.4).

PESTICIDE USE ON HAWAI’I (SECTION 4)

GE seed corn in Hawai’i involves much more intensive use of pesticides than mainland field corn, for instance, 17 times more restricted use insecticides (4.1 to 4.4).

From 2007-2012 on Kauai, DuPont-Pioneer alone applied 90 different pesticide formulations representing 63 active ingredients on 2/3 of the days each year, with on average 8.3 to 16 applications per application day in various years of this period (4.3).

⁴²¹ <http://www.telegraph.co.uk/news/worldnews/australiaandthepacific/australia/8753630/Mass-starvation-of-dugongs-and-turtles-on-Great-Barrier-Reef.html>

⁴²² <http://www.theguardian.com/us-news/2015/sep/13/hawaii-coral-bleaching-scientists-predict-worst-ever>

Large agricultural users of more hazardous “restricted use pesticides” (RUPs) – mostly seed firms – account for 99.8% of agricultural RUP sales on the Islands (4.6).

ADVERSE IMPACTS OF PESTICIDES REPORTED IN HAWAII (SECTION 5)

Pesticide drift frequently sickens Hawaii’s schoolchildren, triggering nausea, vomiting, dizziness and difficulty breathing, among other symptoms, and in some cases necessitating decontamination showers, school evacuations and hospitalization.

Children and adults in Waimea, Kaua’i, downwind of DuPont-Pioneer fields, have been particularly hard hit by pesticide drift and “fugitive dust;” Kaua’i physicians report “almost daily” respiratory complaints, as well as nose bleeds and dermatitis; and they suspect pesticides as a possible cause of high cancer and birth defect rates.

Hawaii’s lack of a pesticide poisoning surveillance system, as found in 11 other states, means that pesticide drift is likely far more common than realized.

HEALTH IMPACTS OF PESTICIDE EXPOSURE (SECTION 6)

Farmworkers and children are at greatest risk from pesticides, due to high exposure and greater sensitivity, respectively. Fetuses (via maternal exposure) are the most vulnerable.

In a major review of the medical literature, the American Academy of Pediatrics found strong evidence linking pesticide exposure of kids to childhood cancers, neurobehavioral and cognitive deficits, adverse birth outcomes, and asthma. Many of the implicated pesticides (e.g. chlorpyrifos, atrazine) are heavily used in Hawaii (6.2).

Adults exposed to pesticides have higher risk of various cancers, Parkinson’s disease, depression, and reproductive problems, such as low sperm counts (6.1).

Studies suggest that even one-time (acute) pesticide poisoning episodes can sometimes have long-term health impacts (6.4).

ENVIRONMENTAL IMPACTS OF PESTICIDES IN HAWAII (SECTION 7)

Hawaii’s incredible biodiversity and many threatened and endangered species are at risk from intensive pesticide use on the Islands.

For instance, atrazine contamination of surface water threatens amphibian life, while many insecticides heavily used in seed corn operations are toxic to bees.

Worldwide Fund for Nature’s (WWF) [Living Blue Planet Report](#) on the state of the world’s oceans

WWF Living Blue Planet Report - an updated study of marine mammals, birds, reptiles and fish - shows that marine populations have declined by 49% between 1970 and 2012.⁴²³

It was published in September 2015 and painted a bleak picture of the state of the world’s oceans: marine populations, including reef ecosystems, have halved in size since 1970 and some species are teetering on the brink of extinction.⁴²⁴ Coral reef cover has declined by 50% in the last 30 years and reefs could disappear by as early as 2050, the report says if current rates of ocean warming and acidification continue. WWF estimates that 850 million people depend directly on coral reefs for their food security - a mass die-off could trigger conflict and human migration on a massive scale. 100 million of these reef-reliant peoples live in the Coral Triangle— singled out in the report as “richer in marine natural capital” than anywhere else on earth. Currently, fisheries exports from the Coral Triangle – which encompasses the waters of Indonesia, Malaysia, Philippines, Papua New Guinea, Solomon Islands and Timor Leste – amount to around \$5bn (£3.3bn), including 30% of the global tuna catch, and a lucrative trade in live reef fish for food markets, which is worth nearly \$1bn (£655m). But there are serious questions about the sustainability of these fisheries.

But the severest threat is to the reef ecosystems themselves: 85% of reefs in the Coral Triangle are classified as threatened, significantly higher than the global average of 60%.

⁴²³ http://assets.wwf.org.uk/downloads/living_blue_planet_report_2015.pdf

⁴²⁴ <http://www.theguardian.com/global/the-coral-triangle/2015/sep/25/wwf-worlds-richest-reef-system-could-soon-succumb-to-climate-change>

More than 40 per cent of coral loss has been caused by outbreaks of the coral-eating crown-of-thorns starfish, which are fuelled by **nutrient run-off** from farms (De'ath et al., 2012). WWF is working with farmers, governments and companies to cut pollution so coral can recover.

Dead zones in the Gulf of Mexico⁴²⁵

Dead zones are defined as large areas of ocean water that are mostly devoid of oxygen. These are a growing problem worldwide. They are claimed to be '**nutrient-rich discharges from farms**, sewage treatment plants, and other sources,' and pose a major threat to marine life. Of the more than 550 dead zones that form each year around the world, the dead zone in the Gulf of Mexico is thought to be the second largest one caused by humans. Scientists have been tracking the size of the dead zone in the Gulf of Mexico for the past 30 years. Data from this year's survey indicate that the dead zone that formed in 2015 is above average in size, likely because of heavy rains in June.

The 2015 dead zone in the Gulf Mexico was measured at 6,474 square miles (16,768 square kilometers) during a July 28 to August 3 survey cruise. For the past five years, the dead zone has averaged about 5,500 square miles (14,245 square kilometers). Hence, this year's dead zone is above average in size.

Scientists writing Lancet Commission Report failed to mention glyphosate and other pesticides

Safeguarding human health in the Anthropocene epoch: Report of the Rockefeller Foundation–

Lancet Commission on planetary health :⁴²⁶ The scientists who contributed to the 56-page RF/Lancet

Commission Report failed to mention the serious threats of exposure to the most widespread chemicals in the global environment, glyphosate (an endocrine disruptor) and the systemic neonicotinoid insecticides. According to the Report, the key drivers of ecosystem change in the last

60 years were: "*Increases in the amounts of nitrogen and phosphorus entering the environment through agricultural fertiliser run-off and soil erosion.*" This is what Defra said in 2011 the Synthesis of the UK National Ecosystem Assessment:⁴²⁷ "*Major increases in fertiliser use, particularly nitrogen*

and phosphorus, have adversely affected aquatic ecosystems through runoff." **What about**

pesticides? One author worked as an environmental health scientist in the Office of the Science Adviser at the United States Environmental Protection Agency and was lead author of a recent paper *Biodiversity loss affects global disease ecology*, which made no mention of pesticides.

When discussing overpopulation, why were references to Prof Paul Ehrlich's work omitted from the RF/Lancet Commission Report?

Accelerated modern human-induced species losses: Entering the sixth mass extinction⁴²⁸

In Science Advances June 2015, Ceballos *et al* calculated the average rate of vertebrate losses over the last century and compared it with the background rate of losses. They estimated it to be up to 114 times the background rate. They said that this rate of loss of biodiversity indicated that a sixth extinction is already underway. The authors described themselves variously as ecologists, field biologists, paleo-biologists or population biologists. However, all had two common beliefs. That the conservation of natural ecosystems is essential to human health, but that the accelerated losses of biodiversity were as a result of human activity.

The Bing Professor of Population Studies in the Department of Biological Sciences at Stanford University and President of Stanford's Center for Conservation Biology, Ehrlich has warned about overpopulation since his first book, the Population Bomb, hit the headlines in 1968.⁴²⁹ Since then, Ehrlich has written about this phenomenon in increasingly urgent terms.^{430,431} Here are some apposite observations taken from these two works:

⁴²⁵ <http://earthsky.org/earth/large-2015-gulf-of-mexico-dead-zone>

⁴²⁶ <http://www.thelancet.com/commissions/planetary-health>

⁴²⁷ file:///C:/Users/Rosemary/Downloads/uk_nea_synthesis_report.pdf

⁴²⁸ <http://advances.sciencemag.org/content/advances/1/5/e1400253.full.pdf>

⁴²⁹ Ehrlich, P. R. *The Population Bomb*. New York: Buccaneer Books (1968).

⁴³⁰ <http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1000330>

There have been increasing signs of great toxic peril for humanity and its life-support systems, with a growing threat from the release of hormone-disrupting chemicals that could even be shifting the human sex ratio and reducing sperm counts;

- Agriculture is a leading cause of losses of biodiversity and ecosystem services;
- An industrial agricultural revolution has created a technology-dependent global food system;
- *But* it has also created serious long-run vulnerabilities, especially in its dependence on stable climates, crop monocultures, industrially produced fertilizers and pesticides, petroleum, antibiotic feed supplements and rapid, efficient transportation;
- Farming is a principal source of global toxification, *pace* Rachel Carson;
- Soils are being degraded;
- “Growth can continue forever if it’s in service industries”, and “technological innovation will save us” are fables;
- Worship of “free” markets should be deprecated;
- Without significant pressure from the public demanding action, we fear there is little chance of changing course fast enough to forestall disaster;
- *This* will require developing mechanisms to force big corporations (including those in big agriculture and big pharma) to bear social responsibilities like the real individuals whose rights they legally want to assume;
- Adverse symptoms of exposure to synthetic chemicals are making some scientists increasingly nervous about effects on the human population;
- Elected officials and other leaders have almost no knowledge of science.

Why is pesticide a taboo word? Are scientists and journalists paid to avoid using it?

An Ecomodernist Manifesto⁴³² in which the authors advocate agricultural intensification states: *“Intensifying many human activities — particularly farming, energy extraction, forestry, and settlement — so that they use less land and interfere less with the natural world is the key to decoupling human development from environmental impacts.”*

The Ecomodernists are wrong.

- It is not possible to decouple humans from the environment; human health depends on biodiversity
- The large dead zones in places like the Gulf of Mexico are not due to nitrogen eutrophication, but to masses of agricultural chemicals destroying aquatic systems
- Farms in the US where Monsanto’s Roundup® Ready crops are grown are biological deserts

REPEATED USE OF HERBICIDES CREATE SUPER-WEEDS (THE US) OR INVASIVE WEEDS (THE UK)

The Pesticides Industry and the BBC found that it was convenient to perpetuate the myth that Japanese knotweed was brought into the UK by the Victorians. ‘*Fallopia japonica* was found in Japan by Phillippe von Siebold and brought back to Europe around 1829’.⁴³³ In fact Japanese knotweed *Reynoutrie japonica* (syn. *Polygonum cuspidatum*) was introduced into Europe in the mid-16th Century by an amateur botanist from the Netherlands, Van Reynoutrie (syn. Karel van Sint Omaars).⁴³⁴ For 500 years it caused no problems.

Historical and chronological evidence suggest that the herbicide glyphosate (or other herbicides that are used as alternatives) is responsible for the transformation of garden escapes into super-weeds (in the UK these are termed ‘invasive species’). Glyphosate was used repeatedly in the same areas

⁴³¹ <http://rspb.royalsocietypublishing.org/content/280/1754/20122845.short>

⁴³² <http://static1.squarespace.com/static/5515d9f9e4b04d5c3198b7bb/t/552d37bbe4b07a7dd69fcdabb/1429026747/046/An+Ecomodernist+Manifesto.pdf>

⁴³³ <http://www.knotweed-removal.co.uk/history-and-biology-of-japanese-knotweed.php>

⁴³⁴ Van Reynoutrie (or Karel van Sint Omaars) (1533-1569) H. Wille: The discovery of the scientific heritage of Karel van Sint Omaars (1533-1569). The Libri Picturati a 16-30 in the Jagiellon Library in Krakow. Scientiarum Historia 22 (1996) 2 67.

and Japanese knotweed developed resistance to it.⁴³⁵ According to the author Richard Mabey in his book: *Weeds: The Story of Outlaw Plants*, “the rampaging spread across Britain in the late 1970s and 80s is regarded as a parable of the dangers of casually introducing alien species into the countryside.” However in 1969 in the UK⁴³⁶ it was still being promoted as a plant suitable for large gardens (as was a member of the Balsam species *Impatiens glandulifera (royalei)*). Glyphosate was introduced in 1974 and by 1981 both plants were classified in the Wildlife and Countryside Act as invasive species.⁴³⁷ In the US, the first confirmed Glyphosate-Resistant weed, rigid ryegrass was reported in 1998 within two years of Genetically-Modified (GM) Roundup® Ready crops being grown. Super-weeds in the US in GM cropping systems are now a massive problem. Between 1996 and 2011, as a result of GM technology, twenty two Glyphosate-Resistant super-weeds had developed which required an additional 239 million kg of glyphosate.⁴³⁸ Some farmland has had to be abandoned in the US because weeds have to be removed by hand.

However, the extent of usage of glyphosate on ‘amenity’ land is ‘unknown’

The CRD commissioned a Report *Determining the Usage and Usage Patterns of Amenity Pesticides Across the UK*, from Risk & Policy Analysts in association with Britt Vegetation Management.⁴³⁹ It was published in February 2011.

The customers for Contractors were: all local authorities across the UK; transport organisations (including the Highways Agency, Network Rail, British Waterways and airport management companies); Ministry of Defence; sports and leisure clubs and facilities (including golf clubs, football clubs, cricket clubs, rugby clubs, bowling greens, leisure centres); conservation bodies (including the National Trust, local Wildlife Trusts, the RSPB, Natural England, National Park Authorities, Countryside Council for Wales, Scottish Natural Heritage and the Environment and Heritage Service Northern Ireland); industrial premises, factories and utility companies; and contracted third parties. The surface types considered were: amenity grass; sports turf; amenity woodland including tree and shrub beds; riparian and aquatic areas; roads; and other hard surfaces, including gravel/ballast surfaces, pavements and kerbs.

From the 240-page Report, of which more than half were questionnaires, it was apparent that:

- So few questionnaires had been returned that it wasn’t possible to apply statistics
- The authors had to extrapolate from the 2007 figures
- To supplement the absence of information they undertook detailed case reports
- The ban on diuron meant that Roundup® would be anticipated to take its place

“In 2007 it was estimated that for the 2006 calendar year, 747 tonnes of active ingredient were used in plant protection products by the amenity sector, 679 tonnes (91%) of which were herbicides and 68 tonnes (9%) were non-herbicides (algicides, fungicides, insecticides and moss-killers).”

The Report failed to mention specifically invasive weeds that have become glyphosate-resistant super-weeds. For an unknown number of years (and in unknown quantities) Roundup® Dakar Pro has been sprayed on Japanese knotweed in Swansea by the nationwide contractor Complete Weed Control. But it keeps on coming back.

Urban and suburban populations are at greater risk of exposure to glyphosate

⁴³⁵ <http://newsroom.dowagro.com/press-release/dow-agrosciences-statement-about-usda-announcement-regarding-draft-environmental-impac>

⁴³⁶ Marshall Cavendish Illustrated Encyclopaedia of Gardening 1969.

⁴³⁷ <http://www.legislation.gov.uk/ukpga/1981/69>

⁴³⁸ <http://www.enveurope.com/content/pdf/2190-4715-24-24.pdf>

⁴³⁹ Amenity_Pesticide_Report_Final Feb 2011.pdf

Urban populations⁴⁴⁰ are more at risk during heavy rainfall from run-off⁴⁴¹ than are rural populations. All this suggests that the population of Swansea has been exposed massive amounts of glyphosate over the last 20 or so years without being made aware of it.



A photograph of a valley in Swansea taken in August 2015; a three-year programme of eradication of Japanese knotweed with Roundup® had been announced by the Council. The first Roundup® was sprayed in April, but by August, new shoots were emerging

Human health depends on biodiversity

Dr Eric Chivian founded the Center for Health and the Global Environment at Harvard Medical School in 1996 *"To help people understand that our health, and that of our children, depends on the health of the environment and that we must do everything we can to protect it"*. He and Aaron Bernstein co-edited a book⁴⁴² *Sustaining Life. How Human Health Depends On Biodiversity* which included contributions from more than 100 leading biodiversity and health scientists and co-sponsored by the United Nations Development Programme, the United Nations Environment Programme, the Secretariat of the Convention on Biological Diversity and the World Conservation Union.

Humans need invertebrates; without them they cannot survive

Prof E.O. Wilson the eminent field entomologist from Harvard, who in his book *Naturalist*,⁴⁴³ has documented massive global declines of ant colonies at the hand of man, said: *"The one process now going on that will take millions of years to correct is the loss of genetic and species diversity by the destruction of natural habitats. This is the folly our descendants are least likely to forgive us."*

The sixth mass extinction is already underway and it is caused by man

Ceballos *et al*: *The average rate of vertebrate species loss over the last century is up to 114 times higher than the background rate. These estimates reveal an exceptionally rapid loss of biodiversity*

⁴⁴⁰ <http://www.sciencedirect.com/science/article/pii/S0045653510007411>

⁴⁴¹ <http://www.ncbi.nlm.nih.gov/pubmed/21128261>

⁴⁴² Chivian, E. & Bernstein, A. (eds). *Sustaining Life. How Human Health Depends On Biodiversity*. Oxford: Oxford University Press (2008).

⁴⁴³ Wilson, E.O. *Naturalist: New Edition for a New Generation*. Washington, DC: Island Press (2006).

over the last few centuries, indicating that a sixth mass extinction is already under way. The authors hold two beliefs in common: that the conservation of natural ecosystems is essential to human health; but that the accelerated losses of biodiversity are a result of human activity.⁴⁴⁴

The human race has learned nothing since ‘*Silent Spring*’

The global pesticides industry has been allowed to dominate the regulatory agencies. They have created chemicals of mass destruction that can no longer be controlled. Furthermore, successive British governments have allowed themselves to be persuaded that only a chemical-based agricultural system can feed the world. Fifty three years ago Rachel Carson’s description of systemic pesticides was correct; nothing has changed apart from the fact that the industry has devised more powerful and persistent weapons. Rachel Carson wrote:

“The world of systemic insecticides is a weird world, surpassing the imaginings of the brothers Grimm. It is a world where the enchanted forest of the fairy tales has become a poisonous forest. It is a world where a flea bites a dog and dies...where a bee may carry poisonous nectar back to its hive and presently produce poisonous honey”.

Will the global élite survive the contamination of the environment with pesticides?

The global élite may be able to survive by eating organic food, but not the pollution of water, soil and air by genotoxic and teratogenic herbicides and insecticides. The agrochemical industry has created a toxic environment from which none can escape. The devastating effects of these silent killers in our water do not distinguish between farmers or city dwellers, the wealthy or the poor, between media Moghuls or their reporters, Monsanto Executives, Presidents, or Prime Ministers. The recent episodes of extreme weather and severe flooding caused by climate change merely spreads the chemicals further.

Rosemary Mason

30 November 2015

⁴⁴⁴ <http://advances.sciencemag.org/content/advances/1/5/e1400253.full.pdf>