

Biodiversity and Pesticides, Why We are Wrong

Pierre-Henri Gouyon

Institut de Systématique, Évolution, Biodiversité (ISYEB), Muséum national d'Histoire naturelle (MNHN), CNRS, SU, EPHE, UA, CP 39, 57 rue Cuvier, 75005 Paris, France.

Abstract: Biodiversity is a dynamic process which has been collapsing at a remarkably high speed for the last thirty years. How can 80% of the insect biomass in protected areas of Europe vanish in such a short period of time? In the meantime, honeybee colonies are collapsing. In each case, the usual answer is that the causes are multifactorial and that more research is needed. A statement that easily satisfies the scientific community. The aim of this paper is to show that, in fact, this consensus results from the manipulation of the scientific management system by social engineers working for the agrochemical industry. Such techniques have been in use since 1953 when they served to hide the major effects of tobacco concerning lung cancer. Indeed, lung cancer, like biodiversity collapse, is multifactorial. But one cause is more important than all others. By insisting on the multifactorial aspect and by manipulating the research system, this fact remains hidden. This process has been documented by journalists and sociologists but remains largely ignored by the community of biologists who are immersed in it and thus largely ignore it.

Keywords: Biodiversity collapse; Pesticides; Merchants of doubt; Bees; Ccd (Colony collapse disorder); Agrochemistry

Historical context: the merchants of doubt

On December 15th 1953, in New York City, a meeting was held that kicked off a new era in the relations between corporations and citizens of the whole world. “Public relations” specialists started becoming “social engineers” and some of them became specialists of scientific disinformation, the so-called “Merchants of Doubt”ⁱ. Indeed, in this meeting, John Hill, from public relations firm Hill & Knowlton, explained to the major tobacco companies that “simply denying the health risks would not be enough to convince the public. Instead, a more effective method would be to create a major scientific controversy in which the scientifically established link between smoking tobacco and lung cancer would appear to be not conclusively known”ⁱⁱ. The conspiracy that started at that moment had enormous success, as shown by Robert N. Proctorⁱⁱⁱ.

One of the interesting facts cited in this book is that the World Health Organization discovered how they had been cheated by the tobacco companies^{iv}. As the WHO later documented, the list of charges was extensive: “Paying WHO Consultants or Advisors for Information or Services, Maintaining Other Potentially Inappropriate Relationships with WHO Employees and Advisors, Employing Former WHO Officials or Promising Employment to Current WHO Officials, Restricting or Diverting WHO Tobacco Control Budgets, Using Financial Contributions to Gain Access and Influence, Using The Food and Agriculture Organization to influence or resist WHO tobacco control, Pressuring or Using Other UN Agencies to Resist Tobacco Control Policies The World Bank, United Nations Conference on Trade and Development (UNCTAD) and the U.N. Economic and Social Council (ECOSOC), International Labour Organization (ILO), Secretly Funding Speakers at WHO Conferences, Misrepresenting Tobacco Company Work as WHO-Supported, Using “Independent” Consultants with Concealed Tobacco Company Ties to Lobby WHO Scientists, Contacting WHO Study Scientists to Influence Study Results, Presenting Tobacco Company Arguments Through

“Independent” Scientists with Concealed Tobacco Company Ties, Compromising Independence and Credibility of WHO Studies by Involving Investigators in Tobacco Company Research or Activities, Funding and Promoting Counter-Research, Creating an Ostensibly Independent Coalition of Scientists, Misrepresenting Scientific Studies to the Media and Regulators”. In the conclusion, they state that “The tobacco companies’ long-secret documents offer a window of insight not only into many of their surreptitious activities, but also into the strategies and attitudes that guide their conduct. To some, these revelations may come only as confirmation of long-held suspicions. To many, however, they will be eye opening.” Indeed, it has been eye-opening! But on several other subjects, eyes have remained wide shut, as will be shown later. The report concludes on a general statement: “At the most fundamental level, this inquiry confirms that tobacco use is unlike other threats to global health. Infectious diseases do not employ multinational public relations firms. There are no front groups to promote the spread of cholera. Mosquitoes have no lobbyists. The evidence presented here suggests that tobacco is a case unto itself, and that reversing its burden on global health will be not only about understanding addiction and curing disease, but, just as importantly, about overcoming a determined and powerful industry.”

As shown by Oreskes & Conway¹, the same strategy has been applied to the denial of climate change in the beginning of the 21st century. What will be shown here is its application to ecological questions as well. Put otherwise, agrochemical companies have obscured the links between their products and the collapse of biodiversity. This point has been investigated by journalists Stéphane Foucart & Stéphane Horel and sociologist Sylvain Laurens^v. A new science has emerged: agnotology^{vi} which studies ignorance and the means by which it can be made or unmade. Scientists working in fields where these processes apply can no longer ignore this branch of sociology. This applies fully to biodiversity studies.

How it applies to Biodiversity and Pesticides

Indeed, a first book about the major role of pesticides in the decline of biodiversity was published by Rachel Carson in 1962^{vii}. She rightly insisted on the threat of extinction faced by numerous forms of life due to pesticides. Her argument undoubtedly convinced many environmentalists and led to DDT being banned. But it had had very little effects on the use of pesticides and did not prevent the massive use of hundreds of other molecules including even more harmful ones. Sixty years later, the amount of pesticides used has dramatically increased and the decline of wildlife is becoming more and more obvious as demonstrated by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) report^{viii}. The IPBES is presented as “the intergovernmental body which assesses the state of biodiversity and of the ecosystem services it provides to society, in response to requests from decision makers.” Its report states: “The rate of global change in nature during the past 50 years is unprecedented in human history. The direct drivers of change in nature with the largest global impact have been (starting with those with most impact): changes in land and sea use; direct exploitation of organisms; climate change; pollution; and invasion of alien species.” Interestingly, here, while the predictions made by Rachel Carson prove to be true, the causes invoked are multiple and the word pesticides does not appear directly as a major cause. One can only presume it falls under the first cause (land use) or the fourth cause (pollution). Have there been new discoveries that allow us to eliminate the hypothesis that pesticides constitute the most important cause behind the loss of biodiversity? Certainly not. Biodiversity collapse is due to multiple causes, just as lung cancer is. And in both cases, social engineers have made sure that this is recognized. In fact, seventy years after that seminal meeting between Public Relations firms and Big Tobacco in New York City, the techniques of social engineering have progressed but the fundamental strategy has remained unchanged: Convince the scientific community and the stakeholders that (i) the problem is due to **multifactorial causes** and that (ii) **more research is needed**. Notice that both assertions are almost always true so that they are easily accepted and that once they are put forward, it becomes easy to hide the main cause, i.e. tobacco for lung cancer, pesticides for the mass

extinction of living organisms. Moreover, very few scientists will be ready to contest the fact that more research is needed.

Mass extinction is now widely documented and a very accurate description of it is given in the IPBES report⁷. Some of the most striking available data comes from a study of the biomass of flying insects in German nature preserves^{ix}. The results clearly show a decrease in biomass exceeding 75% over less than 30 years. How can such a massive effect be explained? It is certainly difficult to address such a broad question. In order to understand what is going on, a case study, i.e. honey bees (*Apis mellifera*) could be more informative^x.

CCD (Colony Collapse Disorder) is a phenomenon that occurs when the majority of worker bees in a honey bee colony disappear, leaving the queen and the remaining immature bees unable to maintain the colony. It is widely admitted that this phenomenon has **multifactorial causes**. The role of a mite, *Varroa destructor*, is also widely admitted together with a variety of causes. The American EPA (Environment Protection Agency) summarizes the causes as follows: "There have been many theories about the cause of CCD, but the researchers who are leading the effort to find out why are now focused on these factors: Increased losses due to the invasive varroa mite (a pest of honey bees). New or emerging diseases such as Israeli Acute Paralysis virus and the gut parasite Nosema. Pesticide poisoning through exposure to pesticides applied to crops or for in-hive insect or mite control. Stress bees experience due to management practices such as transportation to multiple locations across the country for providing pollination services. Changes to the habitat where bees forage. Inadequate forage/poor nutrition. Potential immune-suppressing stress on bees caused by one or a combination of factors identified above." Given the complexity of these causes, it is clear that **more research is needed**. In order to obtain this result, the agrochemical industry has used the strategy designed for the tobacco industry in 1953 and described above. They have cheated the research system by funding any research about CCD except the ones involving pesticides^{xi}, they have employed scientists who criticized the results involving pesticides^{xii} and they have penetrated all possible NGOs which could help. For instance, the Entomological Society of America (ESA) published a report entitled "On the Fate of Insects, Most Troubling is How Much is Still Unknown"^{xiii}; note that the first sponsors cited by this society are the major agrochemical companies^{xiv}. The merchants of doubt have now developed a real social engineering capacity allowing them to obscure the data that they do not like.

Surprisingly, the companies themselves have published some alarming results. Until now, in order to accept a pesticide, tests were made on bees, but these tests concerned solely the acute toxicity. In 2013, the European Food Safety Authority (EFSA) proposed to introduce tests allowing to evaluate the chronic toxicity of pesticides for bees and to reject those which would be proven toxic^{xv}. The proposed protocol has never been applied and the European Community has repeatedly refused to explain why. But the agrochemical companies have actually published the reason. In a paper signed by scientists from Bayer, Dow Agrochemical, Syngenta and others^{xvi}, they demonstrate, using the EFSA tests, that "the chronic risk to honey bees as measured by calculation of ETR_{chronic} adult oral was remarkably different to the acute risk. In this case only 18% of uses were observed to have passed the screening level trigger of <0.03. For this assessment 79% of all herbicide uses failed as well as 75% of fungicide uses and all 92% of insecticide uses. Instead of stating that their products are harmful, they conclude as follows: "The EFSA 2013 guidance for bees is unworkable in its current form and will lead to systemic failure for almost all substances without providing workable higher tier options."

Notice that the fact that 79% of herbicides and 75% of fungicides kill bees probably means that they have comparable effects on all other animals since any animal is biologically more related to a bee than to a plant or a fungus, including humans...

Conclusion: Biologists should realize what is happening

During the last thirty years, more than seventy-five percent of the biomass of flying insects has collapsed in European protected areas. In the meantime, bees have experienced massive Colony Collapse disorders. In the meantime, the vast majority of wild organisms have dramatically declined. It is very likely that there is a general cause for all these facts. And it is very likely that this cause is the use of new pesticides and their systematic application through coated seeds in agriculture. The general biodiversity collapse is undoubtedly multifactorial, just as lung cancer in humans. But like for lung cancer, one cause is largely predominant and if this has not been recognized yet, it is simply because the merchants of doubt have made their best and invested efforts and money in the creation of smoke screens hiding reality. Sociologists and journalists are showing these processes. Agnotology is gaining more and more academic success and should no longer be ignored by scientists. It is urgent that biologists recognize how much they have been cheated by such a system and respond by demanding the proper actions to save biodiversity. If the next thirty years resemble the preceding ones, very little of wildlife will be left.

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ⁱ Naomi Oreskes & Erik M. Conway. 2010. Merchants of Doubt – How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming. New York: Bloomsbury Press

ⁱⁱ Scott M. Cutlip. 1994. The unseen power: public relations, a history. Hillsdale, N.J.: L. Erlbaum Associates.

ⁱⁱⁱ Robert N. Proctor. 2011. Golden Holocaust: Origins of the Cigarette Catastrophe and the Case for Abolition. University of California Press, Berkeley, California

^{iv} Tobacco industry strategies to undermine tobacco control activities at the World Health Organization, Report of the Committee of Experts on Tobacco Industry Documents. July 2000
https://www.who.int/tobacco/publications/industry/who_inquiry/en/

^v Stéphane Foucart, Stéphane Horel & Sylvain Laurens. 2020. Les gardiens de la raison. Enquête sur la désinformation scientifique. Éditions La Découverte, Paris

^{vi} Robert Proctor & Londa Schiebinger, 2008. Agnotology: The Making and Unmaking of Ignorance, the University of Chicago Press

^{vii} Rachel Carson. 1962. Silent spring. Boston; Houghton Mifflin Company, Riverside Press, Cambridge, Mass.

^{viii} IPBES 2020. Global Assessment Report on Biodiversity and Ecosystem Services. <https://ipbes.net/global-assessment>

^{ix} Caspar A. Hallmann, Martin Sorg, Eelke Jongejans, Henk Siepel, Nick Hofland, Heinz Schwan, Werner Stenmans, Andreas Müller, Hubert Sumser, Thomas Hörren, Dave Goulson, Hans de Kroon. 2017. More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLoS ONE 12(10): e0185809. <https://doi.org/10.1371/journal.pone.0185809>

^x Stéphane Foucart. 2019. « Et le monde devint silencieux Comment l'agrochimie a détruit les insectes ». Seuil, Paris.

^{xi} <https://www.theguardian.com/environment/blog/2009/oct/14/bees-scientific-research>

^{xii} James E. Cresswell, Helen M. Thompson. 2012. Comment on "A Common Pesticide Decreases Foraging Success and Survival in Honey Bees". Science, 337, 6101: 1453. *Science*:

Vol. 337, Issue 6101, pp. 1453. <https://science.sciencemag.org/content/337/6101/1453.2> Note that the second author now works for Syngenta

^{xiii} <https://www.entsoc.org/fate-insects-most-troubling-how-much-still-unknown>

^{xiv} <https://www.entsoc.org/about/2020-corporate-partners> In 2021, Corteva, Johnson and Syngenta, note that in 2019, Bayer was on the top of the list.

^{xv} European Food Safety Authority, 2013. EFSA Guidance Document on the risk assessment of plant protection products on bees (*Apis mellifera*, *Bombus* spp. and solitary bees). EFSA Journal 2013;11(7):3295, 268 pp., doi:10.2903/j.efsa.2013.3295

^{xvi} Miles M.J. et al., 2018. Improving pesticide regulation by use of impact analyses: A case study for bees. Julius Kühn Archiv, n°462 (Hazards of pesticides to bees 13th International Symposium of the ICP-PR Bee Protection Group 18. – 20. October 2017, València (Spain) – Proceedings), article 1.21 : <https://ojs.openagrar.de/index.php/JKA/article/view/10041>