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# Environmental health and democracy. The example of lead in gasoline through a case study (1921-1970)

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**Article Proposal – Environmental health and democracy. The example of lead in gasoline through a case study (1921-1970).**

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Contents

Introduction ..... 2

Structure method and sources..... 5

1. A gift from God? The introduction of tetraethyl lead in USA and the subsequent banning in Switzerland (1925) ..... 7

2. Dangerous but cheap – Switzerland authorizes the use of leaded gasoline (1947)..... 10

3. Winning Time: From Acceptance to Weaning (1948-2000)..... 15

Conclusion..... 20

**Environmental health and democracy. The example of lead in gasoline through a case study (1921-1970).**

**Summary**

In 1921, General Motors chemists decided to add tetraethyl, a highly toxic lead additive, in gasoline to reduce ‘knock’ or ‘pinging’ in internal-combustion engines. Despite the opposition from health authorities, the lead additive would come to dominate the global market, particularly during ‘The Great Acceleration’ (1950-2000). Before the progressive elimination of its use, and throughout the 20th century, many voices in the USA, like in Europe, spoke out against the use of, and the environmental contamination from, this additive.

How was the acceptance of widespread poisoning such as lead possible? We analyse the case of Switzerland to explain the acceptance of lead poisoning beyond the USA. Switzerland prohibited its use from 1925-1947, which was a worldwide exception. But it was not to last : indeed, as soon as 1947, the country authorized the use of leaded gasoline.

Several researchers have recently been interested in explaining how problems do not emerge in the mediatic space and consequently are not treated. In other words, they study elements that prevent an actual problem from being considered as such. The political scientist Emmanuel Henry (2021) proposes a reading based on the vast literature on this subject. His approach defines the methodological framework of my study. Henry highlights three processes that block a community's treatment of a given problem: invisibilization; manufactured ignorance; political inaction.

Our aim here is to show how concerns over human health and environmental impacts from toxic lead are not publicized in democratic countries and how corporate interests trumped concerns over the well-being of the community, despite known human risks. This case shows the limits of instruments in parliamentary democracy. Our findings show how actors in the political sphere suppressed those critical of the use of lead through two primary tactics: First, critical voices were marginalized primarily through intimidation and threats paired with the use of biased scientific studies. Second, some of the criticism was addressed by political decision-makers through introduction of measures like control commissions or lead-

concentration limit, which appeased critics. The ‘government of the critic’ through marginalization and absorption is a part of the democratic system in the field of pollution. Governing the critics therefore contributes to a political acceptance, and even legitimization of a worldwide contamination.

Keywords : environmental history, tetraethyl lead, gasoline, pollution.

## Introduction

The next time you pull the family barge in for a fill-up, check it out: The gas pumps read ‘Unleaded.’ You might reasonably suppose this is because naturally occurring lead has been thoughtfully removed from the gasoline. But you would be wrong. There is no lead in gasoline unless somebody puts it there.<sup>1</sup>

The history of the introduction of highly toxic tetraethyl lead (TEL) into fuel is now well known. In the 1920s, chemist Thomas Midgley, working for the General Motors (GM) research laboratory, developed a gasoline additive to reduce ‘knock’ or ‘pinging’ in internal-combustion engines. There were alternatives, but this lead-based technique - patentable and marketable - had the advantage to promise great profit to its discoverers. Despite a contested start and after several fatal accidents linked to the manufacture of the mixture, the American health authorities finally decided to authorise its marketing by the Ethyl Gasoline Corporation. This company was founded by General Motors, together with DuPont and Standard Oil of New Jersey. Several countries banned the use of TEL at the beginning of the twentieth century because of its poisonous nature. In Switzerland, leaded gasoline was banned from 1925 to 1947, a striking worldwide exception. TEL additive is toxic in two ways : the immediate toxicity by direct contact, and the lasting toxicity from regular inhalation or ingestion of lead-contaminated products, cumulatively in small doses. Exposure to lead early in life can result in metabolic damage, neuro-psychological deficits, hearing loss, and growth retardation<sup>2</sup>. In addition, lead exposure affects cardiovascular and reproductive function<sup>3</sup>. This would even have contributed to the increase in crime in the post-war period<sup>4</sup>. Contamination became massive and global, particularly during the Great Acceleration (1950-2000). As with many toxic substances, TEL benefited from the work of some people who historian Naomi Oreskes has called the ‘merchants of doubt’<sup>5</sup>. Toxicologist Robert Kehoe played a major role as merchant of doubt by asserting for almost 40 years that the use of this additive was harmless in studies financially supported by the Ethyl Corporation, DuPont and

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<sup>1</sup> J. L. Kitman, ‘The Secret History of Lead’, *The Nation* (2 March 2000):

<https://www.thenation.com/article/archive/secret-history-lead/>

<sup>2</sup> Nriagu J.O., ‘The rise and fall of leaded gasoline’, *Science of The Total Environment* 92 (1990): 21-22.

<sup>3</sup> R. Slama, *Le mal du dehors: L'influence de l'environnement sur la santé* (Paris, Éditions Quae, 2017), p. 242.

<sup>4</sup> F. Curci and F. Masera, (2018), ‘Flight From Urban Blight: Lead Poisoning, Crime and Suburbanization’, *Institut d'Economica de Barcelona Working Paper* 9 (2018). <https://ssrn.com/abstract=3245090>.

<sup>5</sup> N. Oreskes and E. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (London, Bloomsbury Press, 2010).

the Lead Industries Association. In 1969, the geochemist Clair Patterson was able to demonstrate the main bias of Kehoe's research: his control groups, whose lead levels were considered normal, actually had high levels<sup>6</sup>. Thanks to the activism and professionalism of Patterson and other committed scientists, a policy of de-leading fuel was implemented worldwide, firstly in the United States in the wake of laws against air pollution from 1975, but also, and above all, because lead hindered the proper functioning of the catalytic converter, which made it possible to reduce the harmful emissions of carbon monoxide and nitrogen oxides. As of the 1980s, leaded gasoline was gradually replaced by unleaded gasoline until its use was finally abolished first in the USA and in Europe in the 2000s<sup>7</sup>. The last country marketing leaded petrol, Algeria, banned its sale in 2021<sup>8</sup>.

While the disastrous consequences of the massive use of TEL have been very well documented and the history of its advent and elimination is now well known, historical studies on its dissemination outside the USA remain isolated and incomplete with a few exceptions<sup>9</sup>.

Through the case of Switzerland, my contribution aims to shed light on the acceptance of lead poisoning beyond the USA. Today, the major environmental and health problems caused by the use of leaded fuel additives a century-long, tend to be forgotten.

The incorporation of lead into fuel is often considered as an inevitable technical step in history<sup>10</sup>. Actually, like Fressoz, Bonneuil and other historians show, such ‘mistakes’ in the history of technical progress are often more deliberate and/or awarded than is commonly recognized. In short, the destruction of the environment and the taking of health risks by polluting industries and the leaders who supported them, did not occur by accident. There is a widespread belief that awareness of ecological damages dates back to the 1970s and that since then we have been repairing the mistakes of the past. The so-called ‘environmental reflexivity’ or awareness about environmental and health dangers was in fact quite constant in

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<sup>6</sup> G. Markowitz and D. Rosner, ‘A “gift of God”? The public health controversy over leaded gasoline during the 1920s’, *American Journal of Public Health* **75** (4) (1985), 344-352. <https://doi.org/10.2105/ajph.75.4.344>; G. Markowitz and D. Rosner, *Deceit and Denial: The Deadly Politics of Industrial Pollution* (Berkeley, Los Angeles/London, University of California Press, 2002); Kitman, ‘The Secret History of Lead’; Nriagu, ‘The rise and fall of leaded gasoline’; S. Amter, B. Ross, *The Polluters. The Making of our Chemically Altered Environment*, New York/Oxford, Oxford University Press, 2012); C. Warren, *Brush with death: a social history of lead poisoning* (Baltimore, MD, Johns Hopkins University Press, 2000).

<sup>7</sup> Kitman, ‘The Secret History of Lead’.

<sup>8</sup> ‘Leaded petrol era ‘officially over’ as Algeria ends pump sales’, *The Guardian*, 30 August 2021.

<sup>9</sup> D. Wilson, *The lead scandal: the fight to save children from damage by lead in petrol* (London/Exeter, NH, Heinemann Educational, 1983).

<sup>10</sup> For example, the German Wikipedia page repeats the idea of the lead industry that tetraethyl is the most effective anti-knock agent: ‘Tetraethylblei’: <https://de.wikipedia.org/wiki/Tetraethylblei>

the past. It did not suddenly appear in the 1970s, but rather saw a significant large increase in the current decade<sup>11</sup>. This view - opposing a blind past with a clear-sighted present – is a way of depoliticising – the history of the Anthropocene. Between knowledge and denial, the history of lead in gasoline is a case study of the ‘schizophrenia of modernity’ revealed by Bonneuil and Fressoz<sup>12</sup>.

The use of lead in petrol has been an environmental health scourge. Before the recognition of ‘environmental health’ as a new category by the WHO in 1994, and even before the 1970s, the risks to human health from the massive spread of burnt lead has been constantly debated, but it took some time until the consequences were obvious. From the mid-1970s, increasing mediatic echo and number of studies in the USA put the decision-makers under pressure to minimize or eliminate automotive lead pollution<sup>13</sup>. Among segments of the population directly impacted by leaded gasoline were roadside inhabitants. In addition, roadside workers like policemen or parking attendants constituted a ‘sentinel population’<sup>14</sup> because the surveys showed a high level of lead in their blood. A survey from the U.S. Department of Health, Education and Welfare showed that they were increasingly affected by lead emission-related diseases as of the 1960s<sup>15</sup>. The history of lead in gasoline highlights a constant phenomenon regarding environmental health: inequality<sup>16</sup>.

Although the use of lead as an additive is now banned worldwide, this story is still relevant today. It is estimated that modern man’s lead exposure is 300 to 500 times greater than background or natural levels. In 1983, a British official survey concluded that ‘it is doubtful whether any part of the earth’s surface or any form of life remains uncontaminated by anthropogenic [man-made] lead’<sup>17</sup>. Soils are contaminated by odorless, colorless and tasteless lead, particularly along roadsides and in urban areas<sup>18</sup>. All over the world, on playgrounds and

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<sup>11</sup> C. Bonneuil and J.-B. Fressoz, *The Shock of the Anthropocene: The Earth, History and Us* (London, Brooklyn, NY: Verso, 2016) ; A.-C. Ambroise-Rendu, S. Hagimont, C-F. Mathis, A. Vrigon, *Une histoire des luttes pour l’environnement 18e-20e, trois siècles de débats et de combats* (Paris, Textuel, 2021).

<sup>12</sup> Bonneuil and Fressoz, *The Shock of the Anthropocene*, p. 222.

<sup>13</sup> Nriagu, ‘The rise and fall of leaded gasoline’, pp.21-22.

<sup>14</sup> E. Henry, *La fabrique des non-problèmes. Ou comment éviter que la politique s’en mêle* (Presses de Sciences Po, Paris, 2021).

<sup>15</sup> U.S. Department of Health, Education and Welfare, *Lead in the Atmosphere of Three Urban Communities*, Public Health Service Publication No. 999-AP-12, Public Health Service, Cincinnati, OH, 1965, 94 pp. (study of the PbB (plombémie) of about 2300 individuals in Cincinnati, Los Angeles and Philadelphia), quoted by Nriagu, ‘The rise and fall of leaded gasoline’, p. 21.

<sup>16</sup> R. Bécot, S. Frioux, A. Marchand, ‘Santé et environnement : les traces d’une relation à haut risque’, *Ecologie & Politique* 58 (2019) : 9-20 ; G. Massard-Guilbaud, R. Rodger, *Environmental and Social Justice in the City* (Cambridge, White Horse Press, 2011).

<sup>17</sup> Quoted by Kitman ‘The Secret History of Lead’.

<sup>18</sup> See for example : K. Gruber, « Lead Contamination Across Australia », *Particle*, 22.03.2018. <https://particle.scitech.org.au/earth/lead-here-there-and-everywhere/> (accessed 08 December 2022) ;

in city gardens, public authorities regularly detect the presence of lead, which is particularly difficult to clean up<sup>19</sup>.

How is the acceptance of widespread poisoning such as lead possible? This contamination happened, with a few exceptions, in democracies. How did corporate interests trump concerns over the well-being of the community even though they knew the threats?

The semi-direct democracy in Switzerland's political system theoretically offers opportunities to oppose developments considered as being against the interests of society. However, referendums and initiatives have not been used in this case. In this context, the case of Switzerland can be considered comparable with other countries. What is perhaps different than in France or Germany is the fundamental role of automobile clubs. They play more or less the same role as the cars' manufacturers by promoting a car society and the infrastructure that cars required.

This contribution aims to understand the mechanisms of emergence, or rather non-emergence, of the problem of leaded petrol, in order to better understand the general phenomenon of the acceptance of poisons in the democratic context. It aims also to understand, through a concrete example, how and why the state served as a 'staunch ally of automobile companies'<sup>20</sup> through the 20th century and thus contributed to increasing massive use of cars. The emergence of the automotive society is a part of what J. R. Mc Neil called « a gigantic uncontrolled experiment »<sup>21</sup>, leading to air pollution, environmental and health issues, was also a major contributor to climate change.

## Structure, method and sources

Similar to white lead used for paint or other sources of lead pollution<sup>22</sup>, the development of lead in gasoline follows a 'chaotic chronology'<sup>23</sup> because controversies accompanied its development and its use during the twentieth century.

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« Bleibelastung: Schweres Erbe in Gärten und auf Spielplätzen », Bundesamt für Umwelt BAFU | Office fédéral de l'environnement OFEV | Ufficio federale dell'ambiente, UFAM.  
<https://www.bafu.admin.ch/bafu/de/home/themen/altlasten/dossiers/bleibelastung-schweres-erbe-in-gaerten-und-auf-spielplaetzen.html> (accessed 08 December 2022).

<sup>19</sup> D. Bouquet, *Gestion in situ des sols de jardins potagers modérément contaminés en plomb*. (PhD Thesis, University of Nantes, 2018).

<sup>20</sup> H. A. Baer, *Motor Vehicles, the Environment, and the Human Condition: Driving to Extinction* (Lanham: Rowman & Littlefield, 2019), p. 4; M. Paterson, *Automobile politics: Ecology and cultural political Economy* (Cambridge ; New York: Cambridge University Press, 2007), p. 92 and 115.

<sup>21</sup> J. R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth-Century World*, New-York: W. W. Norton & Company, 2001), p. 4.

<sup>22</sup> M. Eklund, B. Bergback and U. Lohm, 'Historical Cadmium and Lead Pollution Studied in Growth Rings of Oak Wood', *Environment and History* 2 (3) (1996): 347-357.

<sup>23</sup> J. Rainhorn, *Blanc de plomb. Histoire d'un poison légal* (Paris, Presses de Sciences Po, 2019), p. 13.

Our article aims to explain the choice of lead through two episodes which corresponds to two political decisions about lead in Switzerland: its ban in 1925 and its introduction in 1947. In 1925 the decision to ban leaded gasoline was taken in a context of suspicion of lead. The context was very different in 1947. While Switzerland was the last motorized country not to authorize the blend, Swiss promoters of lead asserted that the country was one step behind technical advances compared to other European countries<sup>24</sup>. In the meantime, the American company Ethyl Export based in England since 1930, exported the lead product to Europe. Its main goal was to spread the use of leaded fuel in the world by integrating in its capital companies like BP, Esso and Shell. It worked well<sup>25</sup>. Could Switzerland have continued to act independently in this quasi-monopoly context? The study of these two episodes (1925 and 1947) allows the understanding and the reasons for the success of the resistance against lead in 1925, and finally, why these exceptions have not endured. It also examines the pro and contra arguments for lead, in order to analyse the promotion of poison, as well as the confinement or marginalization of the opponents' voices in the media and political sphere. For several decades, social sciences have studied the emergence of public policies affecting health and the environment in a constructivist perspective. The visibility of controversies often leads to their placement on the political agenda and thus their treatment by public authorities<sup>26</sup>. In contrary, or rather in complement, to these approaches of emergence of controversies and their political handling, several researchers have recently been interested in explaining how problems do *not* emerge in the media and consequently are not treated. In other words, they study elements that prevent an actual problem from being considered as such. The political scientist Emmanuel Henry, proposes a reading based on the vast literature on this subject. His approach defines the methodological framework of my study. Henry highlights three processes that block the community's treatment of a given problem: invisibilization; 'manufactured' ignorance; political inaction<sup>27</sup>.

The first process – invisibilization – one question is central: what explains the poor public attention to a problem? The second process – 'manufactured' ignorance (which was coined by the historian Naomi Oreskes) – how can scientific research, especially its goals and funding, delay the emergence of a problem? And the final process – political inaction – how

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<sup>24</sup> *Der Bund*, 1st June 1947.

<sup>25</sup> Kitman, 'The Secret History of Lead'.

<sup>26</sup> W. Felstiner, R.L. Abel and A. Sarat, 'Emergence and Transformation of Disputes: Naming, Blaming, Claiming', *Law & Society Review* 15 (3/4) (1980) : 631-654 ; F. R. Baumgartner and B. D. Jones, *Agendas and instability in American politics*, (Chicago, The University of Chicago Press 1993) ; P. Hassenteufel (2011 [2008]), *Sociologie politique : l'action publique* (Paris, Armand Colin 208).

<sup>27</sup> Henry, *La fabrique des non-problèmes*.

can political inaction be explained? Why and in what contexts do leaders fail to act or strive to maintain the status quo?

The current analysis was halted in the 1970s precisely because in that time the lead problem had become a ‘publicity’ and had been progressively addressed until the European case was banned in the 2000s. The focus of our research is more about the political and societal acceptance of a poison like lead and not the political regulation of this problem. It is based on a body of historical sources, mainly from parliamentary debates and from the press, but also several other archives (ILO Geneva; Zangger Zurich). They correspond to two ‘arenas’<sup>28</sup>, the political one and the media one, understood here as places allowing to publicize a phenomenon like the toxicity of lead TEL in gasoline<sup>29</sup>.

### **1. A gift from God? The introduction of tetraethyl lead in USA and the subsequent banning in Switzerland (1925)**

As aforementioned, the global lead contamination which accompanied the introduction of TEL into fuel did not happen accidentally. In the 1920’s in the USA, two opposing conceptions arose. These two conceptions appeared clearly during a conference organized by the surgeon general of the U.S. Public Health Service in 1925, in Washington after a series of accidents ensued following the production of TEL. The conference was composed of representatives of industry-entrusted US Bureau of Mines, Ethyl Corporation, labor unions and scientists (toxicologists and health physicians). On the one hand, supporters of TEL presented it as the essential ‘vitamin’ for the proper functioning of a car. At that time, it was not established that oil would be the fuel of the twentieth century: GM developed the TEL in a context of competition with Ford, as well as offering different kinds of fuels. While the model Ford T had low compression engines, GM tended for high compression motors which demanded high octane and use of additives to increase the octane rating. In a close cooperation with DuPont and Standard Oil of New Jersey, GM advanced TEL to patent and profit from it<sup>30</sup>. During the Conference in Washington, the Vice President of Ethyl

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<sup>28</sup> S. Hilgartner and C. L. Bosk, ‘The Rise and Fall of Social Problems: A Public Arenas Model’, *American Journal of Sociology* 94 (1) (1988): 53-78, quoted by Henry, *La fabrique des non-problèmes*, p. 25.

<sup>29</sup> For the selection of the corpus, we conducted keyword searches in the digital archives of the Journal de Genève, a French-speaking liberal daily newspaper read beyond the Swiss borders, and the Bernese newspaper Der Bund to have an example of a newspaper focused on local and Swiss news. Occasionally, we use other newspapers. We have also systematically consulted Touring, the organ of the Touring Club Suisse, the main association for the defense of motoring, for the years 1947, 1955, 1964, 1969, 1973, 1977, chosen because they correspond to political measures concerning leaded gasoline.

<sup>30</sup> Markowitz and Rosner, *Deceit and Denial*, p. 17-18 ; B. Kovarik, ‘Henry Ford, Charles Kettering and the fuel of the future’, *Automotive History Review* 32 (1998): 7-27 ; A. P. Loeb, ‘Birth of the Kettering Doctrine: Fordism, Sloanism and the Discovery of Tetraethyl Lead’, *Business and Economic History* 24 (1) (1995) :72-87;



Corporation, Frank Howard, presented TEL like a ‘Gift of God’ and insisted that the option of petrol – linked with TEL – was the only option for the future: ‘Our continued development of motor fuels is essential in our civilization’<sup>31</sup>. By saying this, he made the opponents to TEL appear as reactionaries. On the other hand, the arguments of the opponents showed a completely different conception. Among the opponents, Alice Hamilton and Yandel Henderson were conscious that the use of TEL will soon be global and believed that contamination will have dramatic consequences for public health. At the end of the Washington Conference, Ethyl gasoline corporation announced a suspension of the production and sale of leaded gasoline until public health issues are resolved. The opponents’ belief in victory was for a short period. The conference established a blue ribbon committee which worked for 7 months<sup>32</sup>. Its conclusions suggested more studies needed to be pursued, which did not happen. The research about leaded gasoline was to be conducted from laboratories and scientists endorsed by Ethyl Corporation and General Motors during the next 40 years. The Public Health Service did not supervise these studies as the committee had recommended. The historians Markowitz and Rosner describe well the option chosen: ‘this is an unfortunate testament to the power of industry’s conception that a valuable (profitable) product should continue to be used until it was proven to be hazardous to consumers’<sup>33</sup>.

At that time, in the 1920’s in Europe, unlike in the USA, motorization wasn’t generalized yet. In some regions, there was even a strong resistance to this mode of transport. For example, in the Grison canton of Switzerland, automobile traffic was completely banned at the time of the beginning of leaded gasoline, from 1900 to 1925. The European and Swiss newspapers reported accidents caused by the new leaded blend as early as 1924. Articles called clearly this blend ‘poisonous gasoline’<sup>34</sup> and spoke about the ‘extremely toxic substance’<sup>35</sup>. The use of leaded gasoline was discussed simultaneously at the international conference of International Labour Office (ILO).

A Swiss toxicologist and director of legal medicine at the University of Zurich, Heinrich Zangger alerted Luigi Carozzi, head of the Industrial Hygiene Section of ILO<sup>36</sup>. In 1925, the

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<sup>31</sup> Quoted by Markowitz and Rosner, *Deceit and Denial*, p. 26.

<sup>32</sup> Markowitz and Rosner, *Deceit and Denial*, p. 20-35.

<sup>33</sup> Markowitz and Rosner, *Deceit and Denial*, p. 35.

<sup>34</sup> *Journal de Genève*, 26 février 1925.

<sup>35</sup> *Der Bund*, 6 novembre 1928.

<sup>36</sup> Archives of ILO, Hy 103/6/59/3 Advisory conference committee list of unhealthy trades, Correspondance with dr. Zangger.

annual conference of ILO concluded by admitting the concern about the consequences of exporting TEL but didn't conduct further research<sup>37</sup>.

As a whistleblower, Zangger started at the end of 1924 a large campaign to alert international organizations like ILO or the League of Red Cross Societies and American health authorities to prohibit the use of the 'death-dealing liquid'<sup>38</sup>, as Zangger called it. In addition to pointing out the hazards of the mixture, Zangger accused Ethyl gasoline corporation of already having exported its gasoline to continental Europe<sup>39</sup>. Both affirmations were denied by the spokesperson of Ethyl<sup>40</sup>. The committed scientist went so far as to plan a conference tour in the United States. However, he eventually cancelled his trip, following the advice of his American colleagues and after receiving threats<sup>41</sup>.

Zangger's fight against lead was more successful in Switzerland, as its harmful claim quickly became public. In an article published by the most important medical journal of Switzerland, the toxicologist explained that the lead compound is 'one of the most violent poisons of the central nervous system'. Zangger insists that the broad use of lead fuel is 'one of the most serious threats to public health' especially for children<sup>42</sup>. The editorial offices received letters from scandalized readers. For example, a reader of the *Journal de Genève* considers it 'lamentable' that 'we are sprayed with this toxin', while concurrently ILO was taking measures against lead paint.<sup>43</sup>

The Swiss Federal Council banned the production and use of lead-containing gasoline on April 7, 1925.<sup>44</sup> The decision was based on the conclusions of Zangger, who alerted the Swiss authorities. To justify its decision, the Federal Council referred to accidents in the production process as well as the potential harmful effects in the long term. This banning didn't raise any opposition in the parliament. The Federal Council didn't just refer to Zangger's opinions and concerns, but pointed to 'the great emotion, especially in medical circles' following the

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<sup>37</sup> *Journal de Genève*, 2 août 1925.

<sup>38</sup> 'Swiss Scientists says dust of Zurich contains lead compounds from motors', copyright 1925, by the New York Times Company, By wirelss to The New York Time, Geneva, 16 March 1925, Archives of Heinrich Zangger Zurich, Zentral Bibliothek, 100.

<sup>39</sup> 'Knock in gas engines foiled by lead atoms', *New York American*, 8 Mars 1925.

<sup>40</sup> 'Denies there is danger from lead in gasoline', Archives of Heinrich Zangger Zurich, Zentral Bibliothek, 100.

<sup>41</sup> H. Rausch, 'Zum 50-Jahre-Jubiläum des Umweltschutzartikels der Bundesverfassung - Ein kritischer Essay', *Vereinigung für Umweltrecht, Umweltrecht in der Praxis* (2022), p. 132 ; M. Breu, S. Gerber, M. Mosimann, T. Vysušil, 'Vom Tiger im Tank – Die Geschichte des Bleibenzins', *Gaia* 11 (2002).

<sup>42</sup> H. Zangger, 'Eine gefährliche Verbesserung des Automobilbenzins', Sonderabdruck aus der *Schweizerischen Medizinischen Wochenschrift* 2, Basel, Benno Schwabe (1925).

<sup>43</sup> *Journal de Genève*, 26 February 1925.

<sup>44</sup> Swiss Federal Archives (SFA), official publications, Management reports of the Federal Council, 1925, p. 246.

announcement of the existence of this new blend produced by Standard Oil<sup>45</sup>. In 1925, this lead-free fuel was an option that could be used without fearing shortages, given there was no monopoly of a specific fuel<sup>46</sup>.

Nevertheless, leaded gasoline had its advocates in the 1920's. Parts of the tourism community and of the car lobby - most vociferously the Automobile Club of Switzerland (ACS) - defended the additive, calling the Swiss ban 'anti-automobile'. At the time, the ACS considered the Swiss authorities to be particularly hostile to automobiles<sup>47</sup>. The president of ACS, the famous engineer, Jules Mégevet, argued in a press release that public health was not at all at risk. He noted that the American authorities are as 'concerned as our own' and that if the blend was dangerous, it would be prohibited in the USA. Mégevet highlighted the use of lead in lead pipes for gas and drinking water, and argued that 'nobody had the idea until now to be concerned about this serious danger to our nervous system'<sup>48</sup>.

Apart from these reactions, the ban of leaded gasoline was unanimously accepted in Switzerland in the 1920's. This political step addressed the health problem. For this reason, the frame proposed by Henry isn't relevant in the case of 1925 to understand this moment because the problem was publicised and solved. On the other hand, even if it didn't work, the first signs of misinformation in order to defend lead usage can be detected. Indeed, actors like ACS relativized the danger of TEL by underlining the toxicity of other leaded products as a diversion. It accords to a recurrent procedure in speeches defending the use of toxic substances<sup>49</sup>. Another method is intimidation of scientists, as the case of Zangger shows. The ban of TEL lasted until 1947 in Switzerland. Ethyl Gasoline Corporation gave the official name of the blend 'ethyl gasoline' which had the advantage of hiding its toxic characteristic<sup>50</sup>.

## **2. Dangerous but cheap – Switzerland authorizes the use of leaded gasoline (1947)**

Switzerland prohibited the use of leaded gasoline from 1925-1947. The longevity of this ban was a worldwide exception. In 1930, Ethyl Gasoline Corporation established themselves first in the UK via Ethyl export from 1930 and then Associated Ethyl Company from 1938 to

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<sup>45</sup> AFS, Publications officielles numérisées, Procès-verbal(-aux) des décisions 07.04.-07.04.1925, E1004.1 1000/9. Band 295 Ref. No 70, Antrag vom 30. März 1925. (Gesundheitsamt).

<sup>46</sup> H. Hochuli, *Die Entwicklung des schweizerischen Benzinmarktes 1936-1948*, Zürich, Dissertation Volkswirtschaft (1952).

<sup>47</sup> Breu, Gerber, Mosimann, Vysušil, 'Vom Tiger im Tank – Die Geschichte des Bleibenzins', p. 204 ; About reaction of the tourism community: *Neue Zürcher Zeitung*, 21 mars 1925.

<sup>48</sup> 'La benzine empoisonnée', *Journal de Genève*, 1<sup>er</sup> mars 1925.

<sup>49</sup> Henry, *La fabrique des non-problèmes*, p. 66.

<sup>50</sup> Markowitz and Rosner, *Deceit and Denial*, p. 19.

market TEL outside the US. In Europe, its demand increased gradually due to the European automotive industry's tendency to favour powerful engines that are able to compete with the American industry. These powerful engines depend on the octane rating that the lead-based blend allows to increase. At the same time, General Motors – a staunch ally of Ethyl Gasoline Corporation – also extended its influence on the European market<sup>51</sup>. Furthermore, the development of TEL in Europe was closely linked to World War II and the need for air forces. Nazi Germany contributed to the acceptance of leaded gasoline as soon as 1935, when the United States Department of Defense decided to tolerate the production of TEL in Germany by I.G. Farben<sup>52</sup>.

In Switzerland, leaded gasoline was still prohibited during World War II. Like a lot of governments, the Federal authorities decide to ration the use of gasoline in order to avoid shortages. Two companies were contracted by the authorities to produce a gasoline additive – an Ersatz – to limit imports and save gasoline. These companies produced liquid substitute fuels, mostly added with paraldehyde and alcohol made from wood from Swiss forests<sup>53</sup>. In fact, these Ersatz additives played the role of TEL – still banned in Switzerland – by increasing the octane rating<sup>54</sup>. After the war, the pro-automobile community was fighting against the production of this local mixture. The automobile clubs accused it – sometimes wrongly<sup>55</sup> – of causing malfunctions in the engine. In fact, the ‘automobile community’<sup>56</sup> which included the automotive lobbyists, specifically blamed its price. In Switzerland in 1948, the pump price was still a third more expensive than in the last years before the war, which gives legitimacy to this argument<sup>57</sup>. Together with the oil industry (Standard, Shell and BP<sup>58</sup>), these circles were lobbying the government to reverse the ban of TEL use, and to abolish the Swiss blend. In 1946, the Swiss Road Federation (FRS), the umbrella organization of the main motorists' associations like the Touring Club and Automobile Club, declared war

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<sup>51</sup> Breu, Gerber, Mosimann, Vysušil, ‘Vom Tiger im Tank – Die Geschichte des Bleibenzins’, p. 204 ; Kitman, ‘The Secret History of Lead’.

<sup>52</sup> J. Borkin, *Die unheilige Allianz der I.G. Farben: eine Interessengemeinschaft im Dritten Reich* (Frankfurt a.M: Campus Verlag, Reihe Campus Bd. 1030, 1990).

<sup>53</sup> D. Ganser, *Europa im Erdölrausch: die Folgen einer gefährlichen Abhängigkeit* (Zurich: Orell Füssli Verlag, 2012), p. 77.

<sup>54</sup> « On pourra utiliser de la benzine éthylysée », *Touring*, 17 avril 1947.

<sup>55</sup> In the summer of 1946, incidents had occurred. In fact, it was not a problem of the additive, but of the gasoline-alcohol ratio: ‘Problèmes actuels du trafic routier’ conference in Fribourg, May 5, 1947, Archives of TCS, Geneva, boîte 175, 1947, dossiers et correspondance, conférences.

<sup>56</sup> C. M. Merki, *Der holprige Siegeszug des Automobils, 1895 - 1930 : zur Motorisierung des Strassenverkehrs in Frankreich, Deutschland und der Schweiz* (Wien etc.: Böhlau, 2002).

<sup>57</sup> Hochuli, *Die Entwicklung des schweizerischen Benzinmarktes 1936-1948*, pp. 98-99.

<sup>58</sup> Hochuli, *Die Entwicklung des schweizerischen Benzinmarktes 1936-1948*.

on the local blend, which it described as a ‘miserable federal cocktail’<sup>59</sup>. The Section for Power and Heat of the War Industry and Labor Office and the military department followed the FRS<sup>60</sup>. In 1946, Switzerland's supply of unleaded gasoline in sufficient quality and quantity was at risk, given the growing importance of leaded gasoline on the market<sup>61</sup>. In 1947, the Federal Department of Home Affairs nominated a first ‘Commission for Ethyl Benzine’ to study the modalities of its introduction in the Swiss market. The commission included representatives of military department, engineers, the manager of Carbura – the semi-state mutual aid organization of fuel importers – and only one physician, Dr. Dettling. Within a short time on April 17 1947, the Swiss Federal Council decided to allow the sale and use of leaded gasoline based on the conclusions of the commission<sup>62</sup>.

The Department of Home Affairs completed its decision with a set of preventive measures. It gave recommendations about handling the product and set up a second commission – almost the same as the first one – charged to examine potential health impacts on public health in the next two years<sup>63</sup>.

This decision raised strong reactions in the newspapers. The satirical newspaper *Nebelspalter* published several caricatures of this controversial decision. One made reference to the experimental and dangerous aspect of this decision, while ironic text suggested entailed business interest:

The federal government allows the use of leaded gasoline  
[...] but only until we know  
whether we are getting sick or dying.  
[...]  
Let us be resistant little guinea pigs  
[...] remain healthy and alive with diligence,  
In order not to make business difficult for the interested parties  
To make more difficult or even to discard.<sup>64</sup>

Members of the commission like Dr. Dettling brought arguments in favour of lead in newspapers and in the press like the *Touring*, which were addressed to car consumers. They

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<sup>59</sup> *Touring*, 22 May 1947; Protokoll der 17. Sitzung des Direktionssausschusses der FRS, 9 mai 1946, Archives du TCS, Genève, boîte 149, 1945-6.

<sup>60</sup> An exception to the ban had already been made for combat aircraft in 1936: M. Breu, S. Gerber, M. Mosimann, T. Vysušil, *Bleibenzin - eine schwere Geschichte: die Geschichte der Benzinverbleiung aus der Sicht der Politik, des Rechts, der Wirtschaft und der Ökologie* (Munich : ökom Verlag 2002), p. 184.

<sup>61</sup> Breu et al., *Bleibenzin - eine schwere Geschichte: die Geschichte der Benzinverbleiung aus der Sicht der Politik, des Rechts, der Wirtschaft und der Ökologie* (Munich : ökom Verlag 2002), p. 121.

<sup>62</sup> Rapport du Conseil fédéral sur sa gestion en 1947, p. 180.

<https://www.amtsdruckschriften.bar.admin.ch/detailView.do?id=50000639#1> (accessed 10 October 2022).

<sup>63</sup> E3300C#1993/154#66\* Direktor Dr. A. Sauter: Eidg. Bleibenzin Kommission ; E5001F#1968/100#11\* Eidg. Bleibenzin Kommission.

<sup>64</sup> « Benzin mit Blei-Tetraäthyl », Caricature de Carl Böckli, 29 mai 1947.

<https://digicopy.afz.ethz.ch/?&guid=8575114b0c374e6db3d675a1272d71e1> (accessed 10. October 2022)

insisted on the technical argument to justify the choice of lead. However, using this argument is contradictory because official advocates of lead admitted at the same time that alternatives exist to increase the octane rating... alternatives like the Swiss additives mentioned above. The economic argument was central: yes, the blend is dangerous but it is first and foremost cheap. Another argument was the fact that the leaded gasoline was already used everywhere, where ‘no negative influence [was] observed’. The members of the commission admitted that its use represented a risk, but they insisted on the first and most obvious danger – poisoning by direct contact – while the second danger – long-term intoxication – was downplayed<sup>65</sup>.

The opponents pointed to both dangers and, like the *Nebelspalter* caricature shows, the risky and uncertain nature of the use of leaded gasoline. This criticism was also present in the parliament. In June 1947, National Councillor Kurt Leupin, a democrat from Basel and professor of pharmacology, submitted a formal request to the Federal Council appealing for information on the reasons for this decision, which ‘could have incalculable consequences for public health’. He asked the Federal Council to address the concerns in the media, and among medical practitioners, and even among roadside workers<sup>66</sup>. The plea, which was supported by a dozen parliamentarians, seems very clear-sighted today: an example of ‘environmental reflexivity’<sup>67</sup> at the beginning of the Great Acceleration. The deputy spoke of a ‘poison policy’ (Giftpolitik) that ‘should not leave parliamentarians indifferent.’ He particularly highlighted the second danger, chronic lead poisoning by inhalation, and mentioned the effects, most of which are now verified. He was annoyed that the Swiss authorities relied on studies coming from the ‘interested trust of the Ethyl Gazoline Corporation.’ In conclusion, he appealed to decision-makers’ sense of responsibility towards future generations to reverse their decision.

The President of Switzerland, Philipp Etter's response was based on Dr. Dettling's statements. He responded to the criticism of the biased nature of the American research by referring to the conclusions of UK studies, also reassuring. He asserted that the matter had been pursued ‘neutrally’ by the Commission. Leupin said he was not satisfied, accused the authorities of

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<sup>65</sup> « A la veille de l'entrée en scène de l'essence éthylisée. Le rapport décisif du professeur P. Schlaepfer, chef du Laboratoire fédéral d'essai des matériaux », *Touring*, 24 avril 1947 ; *Der Bund*, 1<sup>er</sup> juin 1947 ; : « Depuis le 1<sup>er</sup> juillet. Le nouveau carburant rouge aux colonnes d'essence. Ses caractéristiques, ses avantages, ses dangers », *Touring*, 10 juillet 1947 ; *La Liberté*, 2 juillet 1947 ; *La nouvelle revue de Lausanne*, 16 juillet 1947.

<sup>66</sup> Procès-verbaux de l'Assemblée fédérale, Conseil national, séance du 19 juin 1947, p. 747-748. Traduction de l'allemand par l'autrice.

<sup>67</sup> Bonneuil and Fressoz, *The Shock of the Anthropocene: The Earth, History and Us*.

mistaking the Swiss population for laboratory rats, and emphasized on the exponentially increasing effects these emissions will assume.<sup>68</sup>

Between the advocates of leaded gasoline and its opponents, there is another kind of discourse, a fatalist one, between minimization and denunciation. The *Revue automobile*<sup>69</sup> for example didn't share the confidence of the greater majority of the 'automobile community'. The magazine acknowledges the existence of both hazards (accidents and long-term impact) and believes it is 'prudent to introduce them on a trial basis':

Progress requires certain sacrifices [...] Motorists will, in general, have a better performance of their engine [...] Let's make an honest, impartial, scientific test of the two years planned [...] *Wait and see!* [...] If we have to pay too much for the technical benefits of lead .... Then too bad, let's replace it by something else<sup>70</sup>.

This was in 1947; getting rid of lead will take about 50 years. This quote demonstrates the weakness of the idea of a 'blind past'<sup>71</sup> that fits the rhetoric of recent awareness that is omnipresent today in western societies. This point of view leads to some intermediate reflections concerning this 1947 moment in the light of the initial question concerning the agency of opponents in democracy facing the 'merchants of doubt'.

Parliamentary opposition was not addressed by authorities. The commission published its report only 13 years later, in 1960, and its conclusions were that the prohibition was not necessary<sup>72</sup>. Why this failure? To return to Henry's processes, how to explain the invisibility of the lead problem and the ignorance of the Swiss authorities (and of other countries) in the post-war years? This episode from 1947 gives some clues indication. According to the typology of the American politician Elmer Schattschneider in his book, *The semisovereign People: a Realist's view of Democracy in America*, quoted by Henry, the debate here is confined to the space area of 'pressure politics', characterized by negotiation. The debate failed to reach the space sphere of 'party politics', didn't get political and didn't reach a larger area<sup>73</sup>. The 'automobile community' led by the Road Federation presenting itself as the

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<sup>68</sup> Procès-verbaux de l'Assemblée fédérale, Conseil national, 4 décembre 1947 ; « Au Conseil national », *Journal de Genève*, 5 décembre 1947.

<sup>69</sup> Swiss Journal of the Motorist, Central Organ of the Motorist and General Interests of the Traffic. This mistrust is perhaps related to the magazine's target audience, which is not so much consumers as professionals (garage owners, mechanics, etc.) who will at risk and potentially affected from lead emissions.

<sup>70</sup> « La nouvelle essence », *La Revue automobile*, 10 juillet 1947.

<sup>71</sup> Bonneuil and Fressoz, *The Shock of the Anthropocene: The Earth, History and Us*.

<sup>72</sup> U. Haefeli, 'Luftreinhaltepolitik im Strassenverkehr in den USA, in Deutschland und in der Schweiz. Ein Vergleich der Entwicklung nach 1945', in: C.-M. Merki et H.-U. Schiedt (ed.) (1999), *Strasse und Strassenverkehr/Routes et circulation routière, Traverse 2* (1999) : 171-191.

<sup>73</sup> Henry, *La fabrique des non-problèmes*, pp. 40-46 ; E. E. Schattschneider, *The Semisovereign People: A Realist's View of Democracy in America* (New York: Holt, Rinehart and Winston, 1960).

‘owners of the problem’<sup>74</sup> argued that the switch to lead was inevitable in technical and economic terms. The establishment of the commission represents a way to govern the critical voices. Leupin knew it : in two years, the commission was not able to measure the impacts, invisible unnoticed the first several years. Furthermore, the work of the merchants of doubt was paying off after World War II. Clearly, we are not dealing with direct manipulation but rather with a more subtle process: the President of the Confederation was hiding behind studies financed by the petrochemical industry.

### **3. Winning Time: From Acceptance to Weaning (1948-2000).**

In the fifties, critical voices alerted the public and the authorities about the dangers of leaded gasoline in Switzerland and other countries, while the number of privately-owned vehicles increased. In the USA, facing smog and other environmental impacts from automobiles, a ‘thirty-year process of strengthening environmental regulation’<sup>75</sup> was launched. This nuisance started to concern European authorities. In Switzerland, the 1961 conversion of the “Commission for Ethyl Benzine” to the “Commission for Air Hygiene” reflected these concerns. In that time, an increasing number of studies from Swiss medical practitioners were denouncing the omnipresence of lead in the air and human bodies, and its ensuing clinical consequences<sup>76</sup>. Gradually, two rival camps were emerging in the medical community: Those at the head of the commission and those who denounced the human health risks of lead. The people at the head of the Commission were linked to the governmental authorities who tended to downplay the danger to human health. For example, the president of the Commission for Air Hygiene, Dr. Högger softened several alarming conclusions documented by members of his team<sup>77</sup>. On the other side, the whistleblowers conducted independent research on their own patients. Among these outsiders, one can mention Dr Fatzer, who refused to join the

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<sup>74</sup> J.R. Gusfield, *La culture des problèmes publics: l’alcool au volant : la production d’un ordre symbolique* (Paris : Economica, 2009).

<sup>75</sup> T. McCarthy, *Auto mania : cars, consumers, and the environment* (New Haven: Yale University Press, 2007), p. XVII.

<sup>76</sup> T. Bersin T., ‘Bleihaltiger Treibstoff-Abgasgifte’, *Med. Neuheiten* **63** (1957) ; R. Fatzer, ‘Anzeichen von Bleivergiftung?’, *Schweizerischen Medizinischen Wochenschrift* **83** (5) (1960) ; L. Jecklin, ‘Bleistaub in der Luft’, *Das Schweizerische Rote Kreuz* **65** (5) (1956): 9–10.

<sup>77</sup> For example the ‘Study of blood lead levels and leaduria in two groups of prisoners, one interned in the countryside, the other in the immediate vicinity of a highway’ led by Lob and Desbaumes was edulcorated in the final report of 1971: D. Högger (ed.), *Das Problem der Benzinverbleiung: Untersuchung der Eidgenössischen Kommission für Lufthygiene, Berne, Eidgenössisches Gesundheitsamt* (Bulletin des Eidgenössischen Gesundheitsamtes, Sonderdruck aus der Beilage B, n° 3, 1971). SFA: E7256-01#2011/232#461\* Eidgenössische Kommission für Lufthygiene: Berichte.



commission or Dr. Cramer, who simply called for a ban ‘regardless of the interests involved, even if they are oil-based’ in 1964<sup>78</sup>.

Let’s go back to the moment of introduction of TEL in Switzerland. After two years of observations, in 1949, the commission's mandate was renewed without producing a report ‘as the research did not yield any clear results’ justifying itself<sup>79</sup>. In 1953, an intermediate report called *Study on the impurities with lead compounds* concluded that ‘there are no significant hazards to the public’<sup>80</sup>. In the fifties and sixties in the USA, Robert Kehoe and his team from the Kettering Laboratory, asserted that lead was naturally present in the human body, which safely could absorb it without developing adverse symptoms. His studies were supported by Ethyl Corporation, DuPont and the Lead Industries Association<sup>81</sup>. It’s interesting to look at the consequences of the work of the “merchants of doubt” in the precise case of Switzerland, and the intermediate report of the Commission for Ethyl Benzine in 1953. This reassuring study on the presence of lead particles in food had certain biases, but not only because several of its conclusions were based on Kehoe’s research. The authors selected studies that tolerated a high concentration of lead in human body. For example, the study quoted a Britain scientist Monier Williams who believed that one should not ingest more than 1 mg of lead per day. The Swiss study retained this conclusion, rather than that from Schwarz et Spitta<sup>82</sup> who considered that 0,1 mg is sufficient to be harmful, a concentration ‘which looks excessively low’ to the author. Finally, ‘it seems that the value of 1 mg offers safety’ says the author. This example shows how arbitrary were most of the conclusions defining acceptable thresholds. They tended to retain the more recent American researches, strongly influenced by the lead industry. The Swiss commission recommended setting a threshold, which the Federal Council did in April 1955 (0.6 cm<sup>3</sup> /liter)<sup>83</sup>. At the same time, Ethyl planned to increase the quantity of lead in gasoline and was embedding more deeply in the European market<sup>84</sup>.

However, in the 1960’s the attention towards the deleterious effect of leaded gasoline grew. In the USA after years of absence of independent studies, the Public Health Service published

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<sup>78</sup> « Une grave question. Le plomb menace-t-il la santé publique ? », *Touring*, 13 février 1964.

<sup>79</sup> AFS, E7310A#1973/117#203\*, Protokoll über die Sitzung des Carburas Vorstandes 9. Juin 1949.

<sup>80</sup> AFS, E3300C#1993/154#66\* Direktor Dr. A. Sauter: Eidg. Bleibenzinskommission: *Untersuchung über die Verunreinigungen mit Bleiverbindungen, hervorgerufen durch die Verwendung bleitetraäthylhaltiger Motofahrzeug-Treistoffe*, 30 octobre 1953.

<sup>81</sup> Markowitz and Rosner, *Deceit and Denial*, p. 109.

<sup>82</sup> G.W. Monier-Williams, *Trace Elements in Food* (London: Chapman & Hall, 1949) ; Z. Schwartz, *Angewandte Chemie* **13** (1926): 829-30 ; Spitta, *Zentralblatt für die gesamte Hygiene mit Einschluss der Bakteriologie und Immunitätslehre* **29** (1933): 689-705.

<sup>83</sup> Recueil officiel, 1955, cahier 17. En réalité, le seuil limite avait déjà été fixé à 0,6 en 1947 mais il reposait sur des bases juridiques floues (Breu et al., 2002A).

<sup>84</sup> Warren, *Brush with death: a social history of lead poisoning*, p. 204.

their first study *The Three City Survey (1961-1963)* (Los Angeles, Philadelphia, Cincinnati) which revealed very high blood lead levels in the urban population, compared to the rural population<sup>85</sup>. In 1965, a study of Patterson showed that lead concentration in the ice of Greenland had increased by 400% between the middle of the 18th century to the middle of the 20th century; then by 300% between 1940 and 1965<sup>86</sup>. The independent geochemist and other scientists pointed to the industrial lead's adverse impact on the environment and the role of the TEL. A conference was convened by the Public Health Service for the first time after 1925. In 1969, Patterson proved the biases of Kehoe's samplings and research<sup>87</sup>.

In the 1950's and 1960's, despite awareness in some scientific circles, the debate did not emerge immediately, neither in the USA media<sup>88</sup> nor in Europe. How to explain this non-emergence during these two decades? Furthermore, in the context of our research question, how to explain the impotence of these voices facing widespread lead contamination? Many authors studied the battle against lead on a legislative, judicial and administrative scale in the USA. They showed how the industry of lead tenaciously defended its strategic product whose elimination assured serious repercussions in the petroleum and automotive industry<sup>89</sup>. But what happened in the period before effective policy measures (in the mid-1970's) in a European and national scale?

The example of another resistance from 1955 at the Swiss parliamentary level, eight years after Leupin's opposition, provides some clues. The independent Zurich National Councillor Alois Grendelmeier submitted a postulate on ethyl gasoline, which was supported by about 20 parliamentarians. He asked the Federal Council if they believed that there was a 'threat to public health', given increasing traffic. He requested that neutral experts study the question, publish a survey and relate political measures. In his speech, the member of parliament indicated the 'suffering of the population' that 'has no choice but to live in this air'. He noted that about 1 billion liters of gasoline are consumed annually in Switzerland, which results in about 250,000 kilograms of lead salts burned per year. Grendelmeier insisted on the unanimity among the practitioners who confirmed the predictions of Heinrich Zangger thirty years earlier. He criticized the bureaucratic, out-of-touch nature of the commission and the absence of practicing physicians 'who pay attention to the lives and sufferings of the

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<sup>85</sup> Markowitz and Rosner, *Deceit and Denial*, p. 110 ; Warren, *Brush with death: a social history of lead poisoning*, pp. 206-210.

<sup>86</sup> C. Patterson, 'Contaminated and Natural Lead Environments of Man' *Archives of Environmental Health* 11 (3) (1965): 344360.

<sup>87</sup> Markowitz and Rosner, *Deceit and Denial*, p. 111-114.

<sup>88</sup> Warren, *Brush with death: a social history of lead poisoning*, pp. 216-217.

<sup>89</sup> Warren, *Brush with death: a social history of lead poisoning*, from p. 208

population'. Similar to eight years earlier, Philipp Etter defended his politics of lead tolerance through technical arguments. His answers were based on Dr. Dettling's conclusions and on the fact that all motorized countries adopted them and the commission's reassuring intermediate surveys (based on Kehoe's results). Ironically, Etter accepted the postulate, meaning that he took into consideration Grendelmeier's concerns. He also argued that the commission didn't publish its final results<sup>90</sup>. Moreover, the debate remained mostly confined to parliament and lasted only a few hours in the 1950's and 1960's.

In that time, the TCS was playing a fundamental role in the promotion of this mode of transport, similarly to the auto-industry in other countries. Since the 1920's, the TCS was fighting the collateral damages of automobile traffic in order to improve the image of the automobile. For example, by promoting road safety or more specifically, finding solutions for car cemeteries. The services TCS offered (breakdown service, etc.) boosted the number of its members<sup>91</sup> which gave the pressure group recognition by the authorities<sup>92</sup>. Furthermore, the association had a certain hold on the media and newspapers. An example of this is the fully-paid invitation of journalists to visit road infrastructures in Europe<sup>93</sup>. The TCS hardly mentioned the debate about lead emissions in the 1950s. Given his role as 'owner of the problem', its obfuscation of health damage locked up the debate. In the 1960s, its newspaper addressed TEL pollution issues, but tended to downplay, queried, or even deny them<sup>94</sup>. Invisibility gave way to a type of 'factory of doubt'. In the 1970's this kind of article coexisted with unequivocal pleas against the lead additive in a kind of schizophrenia<sup>95</sup>. On a political scale, the comments about lead often refers to the research of Kehoe. It has a direct influence on the definition of threshold suggested in the surveys of the Commission for Ethyl Benzine and in the Commission for Air Hygiene from 1961. The Federal authorities reduced lead from 0,63 g/l in 1947 to 0,15 for normal gasoline in 1984. When Grendelmeier in 1955 tried to alert the authorities, it was 0,63. Only in 1971 was lead reduced to 0,54<sup>96</sup>.

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<sup>90</sup> Procès-verbaux de l'Assemblée fédérale, séance du 28 septembre 1955, from p. 342. <https://www.amtsdruckschriften.bar.admin.ch/viewOrigDoc/100004821.pdf?id=100004821> (accessed 10 October 2022). See also : « Von Flüssigkeiten aller Art », *Die Tat*, 30 septembre 1955.

<sup>91</sup> Half a million people in 1969 : *Touring*, 2 janvier 1969.

<sup>92</sup> A. Mach, *Groupes d'intérêt et pouvoir politique* (Lausanne : Presses Polytechniques et Universitaires Romandes, 2015), 37.

<sup>93</sup> *Touring*, 7 juillet 1955.

<sup>94</sup> For example, by talking about 'allegedly dangerous pollution of the atmosphere': « Les problèmes du plomb et de l'oxyde de carbone dans les gaz d'échappement », *Touring*, 10 avril 1969.

<sup>95</sup> « Une grave question. Le plomb menace-t-il la santé publique ? », *Touring*, 13 février 1964 ; « Le conducteur est-il toujours un meurtrier ? », 8 mars 1973 ; « Diminution de la teneur en plomb de l'essence. Problèmes et contradictions », 17 mars 1977 ; « Les effets sur l'homme des gaz d'échappement des moteurs », *Touring*, 30 juin 1977.

<sup>96</sup> E3300C#1996/290#623\* Reduktion des Bleigehalts im Motorenbenzin "unverbleit" 1983 – 1985.

From the mid 1970's, the doubts about the danger of lead in gasoline – by scientists close to the auto, petrol and lead industry - had finally been dismissed. Research documented the effects of global contamination: no fewer than 5,000 papers on TEL toxicity were published in 1978 alone<sup>97</sup>. The lead issue became a major public health concern, first in the United States where unleaded fuel was introduced in 1975. By that time, by some estimates, so much lead had been deposited in soils, streets, and building surfaces that an estimated 68 million children would have toxic levels of lead in them and some 5,000 American adults would die each year from lead-induced heart disease<sup>98</sup>. As part of the laws against air pollution, manufacturers must equip their engines with catalytic converters that reduce CO and NO<sup>x</sup> emissions. Lead was not only toxic, but also hindered the function of these catalytic converters. Hence, it is also for mechanical reasons that oil companies are finding ways to reduce lead content. In Europe, Germany was at the forefront of the fight against lead, which eventually was to disappear from the EU in 2000<sup>99</sup>. Since the 1970's, auto lobbies and industry advocated for the catalytic converter, as a way to reinvent and save the car industry.

As aforementioned, the study of this phase which has been well analysed for the USA, while Europe and Switzerland strives to follow Germany's lead<sup>100</sup> - is beyond the scope of this article. Parallel to the politicization and subsequent treatment of the problem at the global level, the factory of doubt did not immediately disappear. In my opinion, it contributed to the spread of the idea that the introduction of lead in gasoline was due only to technical reasons and that this 'mistake' was corrected in the 1970s, 1980s and 1990s by removing lead from gasoline. The work merchants of doubt often outlasts their time. Lead advocates were still quite vocal in the 1970s. For example, Marc Lhéraud – president of the Lead Information Center –, relativized the dangers of lead additives in 1974 in a series of respectable scientific outreach literature<sup>101</sup>. Moreover, he announced a new possible use of lead that, according to the author, can protect against radioactivity: 'On the threshold of the atomic age, it is not forbidden to think that this ancient servant of mankind will be used extensively to protect

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<sup>97</sup> Nriagu, 'The rise and fall of leaded gasoline', p. 21.

<sup>98</sup> D. Blum, 'Looney Gas and Lead Poisoning: A Short, Sad History', *Wired*, 5 janvier 2013.

<sup>99</sup> E. Bussière, *Milieux économiques et intégration européenne au XXe siècle* (Berne : Peter Lang, 2006) ; V. M. Thomas, 'The Elimination of Lead in Gasoline' *Annual Review of Energy and the Environment* 20 (1) (1995): 301-324.

<sup>100</sup> M. Näsman and S. Pitteloud, "The Power and Limits of Expertise: Swiss–Swedish Linking of Vehicle Emission Standards in the 1970s and 1980s", *Business and Politics* 24 (3) (2022): 241-60; <https://doi.org/10.1017/bap.2022.3>; Breu, Gerber, Mosimann, Vysušil, 'Vom Tiger im Tank – Die Geschichte des Bleibenzins'; U. Haefeli, 'Luftreinhaltepolitik im Strassenverkehr in den USA, in Deutschland und in der Schweiz.

<sup>101</sup> M. Lhéraud, *Le plomb* (Paris : Presses Universitaires de France, Que sais-je, 1974).

mankind'<sup>102</sup>. The conclusion of the final report of the Federal Commission for Air Hygiene in 1971 even denied some current harm, but at the same time recommended to reduce its use<sup>103</sup>. As in most European countries, Switzerland banned leaded gasoline from pumps on January 1, 2000. As one Ethyl executive noted internally, Kehoe - who increasingly aroused scepticism in the scientific and political arenas from the late 1960s - 'bought us time'<sup>104</sup>.

## Conclusion

By examining the political acceptance of a danger in terms of environmental health, I wanted to show the vast awareness of on-going poisoning, even in automotive circles, and the invisibility of awareness. These mechanisms also existed in several cases of contamination, (insecticides like neocide, DDT, asbestos, etc.). And recently, researchers have demonstrated that the oil industry was aware of the global warming problem as early as the 1970s. In the 1980's, a campaign was started to dispute climate science and weaken international climate policy<sup>105</sup>. These mechanisms highlight a certain powerlessness of democracies as long as an environmental and/or health problem is not publicized and remains confined to the political arena. It leads, at best, to small measures that avoid wide media coverage and the use of direct democracy tools. My case study shows that political opposition to an industrial poison can be attended to, marginalized or absorbed by the authorities<sup>106</sup>.

The first moment (1925) showed that warnings can be listened to, provided that the doubt factory is not too powerful and that the prohibition measure does not threaten supply.

Marginalization, which affects whistle-blowers, take two forms: punctual and structural. It was punctual when it affected the speech of opponents, as when Dr. Zangger received threats or when Clair Patterson was directly attacked by the world of lead toxicology<sup>107</sup>. On the Swiss scale, I also observed some mockery targeting politicians critical of, or doctors reporting, the threat of low-level lead contamination in the 1950's and the 1960's<sup>108</sup>. Structural marginalization concerns the socio-professional paths of whistle-blowers. The

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<sup>102</sup> Lhéraud, *Le plomb*, p. 8.

<sup>103</sup> Högger (ed.), *Das Problem der Benzinverbleiung: Untersuchung der Eidgenössischen Kommission für Lufthygiene*, Berne, Eidgenössisches Gesundheitsamt, p. 199.

<sup>104</sup> Markowitz and Rosner, *Deceit and Denial*, p. 116.

<sup>105</sup> Bonneuil, Christophe, Pierre-Louis Choquet and Benjamin Franta, 'Early Warnings and Emerging Accountability: Total's Responses to Global Warming', 1971–2021'. *Global Environmental Change* 71 (2021). <https://doi.org/10.1016/j.gloenvcha.2021.102386>.

<sup>106</sup> C. Pessis, S. Topçu, C. Bonneuil, *Une autre histoire des « Trente Glorieuses » : modernisation, contestations et pollutions dans la France d'après-guerre* (Paris, La Découverte, 2013), pp. 25-27.

<sup>107</sup> C. I. Davidson, *Clean Hands: Clair Patterson's Crusade Against Environmental Lead Contamination* (New York : Nova Science, 1999); Warren, *Brush with death: a social history of lead poisoning*, from p. 210) .

<sup>108</sup> W. Blumer, *Motorisierung - Seuche des Jahrhunderts* (Erlenbach/Zurich/Stuttgart: Eugen Rentsch Verlag, 1973), p. 8.

structural inequalities<sup>109</sup> between provincial physicians and the experts of the commission should also be highlighted.

I consider that the absorption of criticism plays an even more decisive role in the non-emergence of the controversy with respect to health and environmental risk. First, it affects the medical community. Dr. Dettling, at first was very much opposed to the use of leaded gasoline, but became tempered from the moment he worked for the authorities within the commission for ethyle benzine<sup>110</sup>. Some did not want to compromise themselves: Dr. Fatzer, a dentist in Wädenswil, was approached to join the commission but he refused. As an outsider, he tried from 1958 to the late 1970s to put pressure on the Swiss Health department and politicians by sending dozens of studies documenting the toxicity of lead<sup>111</sup>. Some of the criticism was dealt with by political decision-makers through the introduction of control measures. The formation of commissions is also a way to silence the critics, like in 1947. The regulation measures also represented an escape from criticism. Several researchers showed that the definition of threshold allowed for the acceptance of contamination. They managed to legitimize the exposure of societies to toxic substances<sup>112</sup>. The fact that national expert commissions referred to literature produced by merchants of doubt, contributes to this acceptance. In the case of lead, the focus on the first hazard and short-term exposure has often supplanted the second hazard and chronic exposure, although this has been a concern since the 1920s. The establishment of exposure limits as early as the 1950s made it possible to absorb and silence warnings about this second hazard, which became a reality in the post-war period. Finally the weight of the ‘owners of the problem’, in this case the automobile associations, cannot be neglected, as was seen with the acceptance of the poison in 1947. Many other aspects could be further explored, such as the role of manufacturers. Their shift to the catalytic converter is a way of adapting to state concerns and demands. Unleaded gasoline and catalytic converters were tools used by the auto industry in the 1980s to sell the idea of a ‘clean’ car; an idea many people accepted. A parallel can be drawn today with ‘clean’ electric cars. We should all keep in mind that the automotive industry must ensure its survival and secure its attractiveness on the market. Preserving life on earth is not a lever for their actions.

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<sup>109</sup> Henry, *La fabrique des non-problèmes*, p. 76.

<sup>110</sup> During the war, he declared in his lectures about the use of lead in gasoline that it was one of the greatest crimes of the 20th century : Dr. Brönnimann, « Der Verursacher muss an die Kasse! », *Der Bund*, 22 décembre 1983.

<sup>111</sup> AFS, E3300C#1993/154#66\* Direktor Dr. A. Sauter: Eidg. Bleibenzinskommission; E3300C#1996/290#630\*. Bleibenzin. Dr Fatzer.

<sup>112</sup> S. Boudia and N. Jas, *Gouverner un monde toxique* (Versailles : Quae éditions, 2019).

In the oppositions to lead by parliamentarians in the 1940s and 1950s, one leitmotif recurs: the demand that decision-makers inform the public and base their decisions on truly independent, non-partisan, studies. In his 1947 speech, National Councillor Leupin urged authorities to call a spade a spade: the name ‘ethyl gasoline’ reveals nothing. People must know that it is about large-scale lead burning, he pleaded. I would also like to mention Gertrud Woker, a Swiss chemist ostracized by her colleagues, who was a pioneer in denouncing lead pollution and war gases. She exclaimed at the time, ‘The public must be informed!’<sup>113</sup>. This kind of demand is the same type of claim denounced by climate activists since 2019.

This story highlights the impotence of the traditional parliamentary system, the weight influence of lobbies, and calls for thinking about new forms of democracy. Some researchers see hope in participatory practices at the local level that are closer to addressing the impacts of our toxic world. This is much like practicing physicians in the 1950s, who saw their patients suffering from the stress that motorization brought. Turning to local decision-makers, then, would be a political alternative to poisoning the world, ‘no matter how difficult the task’<sup>114</sup>.

The ‘government of the critic’<sup>115</sup> through marginalization and absorption is a part of the democratic system in the field of pollution. Governing the critics at a national scale therefore contributes to political acceptance, and even legitimization of a worldwide contamination.

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<sup>113</sup> Fabian Chiquet et Matthias Affolter, *Die Pazifistin – Gertrud Woker: Eine vergessene Heldin*, documentary film, First Hand Films, 2021 – 75min.

<sup>114</sup> Boudia and Jas, *Gouverner un monde toxique*, pp. 99-100.

<sup>115</sup> Pessis, Topçu and Bonneuil, *Une autre histoire des « Trente Glorieuses » : modernisation, contestations et pollutions dans la France d’après-guerre*.