

Article

Latent and Cumulative Intoxication in Jules Héricourt's *Les Frontières de la Maladie* (1904)

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Abstract

This article re-examines the French military physician and physiologist Jules Héricourt's (1850–1938) treatment of what he termed intoxications d'origine externe, intoxications of external origin, in his popularising 1904 book *Les Frontières de la Maladie: Maladies Latentes et Maladies Atténuées*. Héricourt grouped alcohol, tea, coffee, tobacco, and carbon monoxide under a single clinical logic: each, in his account, produced disease gradually, cumulatively, and at exposure levels too low to be recognised as pathological. Through close, critical reading of the primary text, supplemented by biographical and historiographical contextualisation, this study asks how Héricourt characterised each form of intoxication, on what evidentiary basis, and what his synthesis contributes to the historiography of chronic toxic exposure. The analysis shows that most of Héricourt's specific clinical claims lack a stated evidentiary basis and that several derive directly from earlier authors; his scientific authority rested chiefly on his experimental physiological work with Charles Richet rather than on documented clinical toxicology. The article argues that the book's historiographical significance lies not in medical originality but in its role as a widely read popularisation of the idea that ordinary domestic and social habits could produce disease through prolonged, low-intensity, unrecognised exposure, an idea that resonates, at the level of general logic, with later models of chronic and cumulative toxic exposure. This resonance is treated as suggestive rather than as evidence of direct influence.

Keywords: Jules Héricourt; latent disease; chronic intoxication; history of toxicology; history of medicine; France; twentieth century



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1. Introduction

This article examines how the French military physician and physiologist Jules Héricourt (1850–1938) conceptualised what he termed *maladies latentes* and *maladies atténuées*, latent and attenuated forms of illness, in his 1904 book *Les Frontières de la Maladie: Maladies Latentes et Maladies Atténuées* (The Limits of Disease: Latent and Attenuated Forms of Illness, author's translation). Central to this taxonomy was a category Héricourt called intoxications d'origine externe, intoxications of external origin, which grouped together the effects of alcohol, tea, coffee, tobacco, and carbon monoxide. Pharmacologically, these agents have little in common: alcohol is a central nervous system depressant, caffeine and nicotine are stimulants, and carbon monoxide is neither a drug nor a substance of voluntary consumption. What united them in Héricourt's account was not pharmacology but a shared clinical logic, namely that each produced disease gradually, cumulatively, and

at levels of exposure too low to be recognised as pathological by either patient or physician. It is this logic of latency, rather than any coherent pharmacological class, that the phrase “early intoxication” designates in the present study and that constitutes its analytical focus. The substances are accordingly discussed here as agents of latent, cumulative intoxication, following Héricourt’s own vocabulary, rather than as “psychic stimulants”, a label that is pharmacologically inaccurate for alcohol and does not correspond to any single term used in the source text.

The historiographical interest of this material is twofold. First, Héricourt’s taxonomy is an early and unusually systematic attempt, within a widely read popularising text (twenty-nine editions by 1920), to articulate a concept of subclinical, cumulative toxic exposure, one that anticipates, in a rudimentary and non-experimental form, categories now central to toxicology and public health, such as chronic low-dose exposure. Second, and more cautiously, the text illustrates how a physician working within an experimental physiological tradition, but writing for a lay readership, negotiated the evidentiary demands of clinical medicine and the rhetorical demands of popularisation, often blurring the two. This article does not claim that Héricourt’s specific clinical observations were original or medically accurate by the standards of his own time or of the present; several, as shown below, rest on speculative or poorly evidenced reasoning. Its contribution is instead to the intellectual and cultural history of how a working category of latent disease was constructed and popularised across substances as different as alcohol and carbon monoxide, and to ask what this construction can, and cannot, tell historians about the longer genealogy of chronic-exposure thinking in medicine.

Alcohol, tobacco, tea, and coffee had all been objects of medical and moral scrutiny in Europe since at least the seventeenth and eighteenth centuries, when their introduction or wider diffusion first prompted debate about their physiological and social effects (Courtwright 2001; Schivelbusch 1993). By the late nineteenth century, the consolidation of experimental physiology, Pasteurian bacteriology, and social hygiene as a programmatic discipline had reframed the excessive use of these substances as a form of chronic intoxication, understood as the slow, cumulative poisoning of the body through everyday habit and linked to physical degeneration, nervous disorder, and social decline (Courtwright 2001; Prestwich 1988). This was not solely a medical matter: it intersected with wider anxieties about urban modernity and the sustainability of the social body under rapid industrialisation, within a new global consciousness of psychoactive substances shaped by colonial trade and imperial medicine (Gootenberg 2022). In France specifically, the politics of alcohol and tobacco were embedded in republican debates about public health and national vitality (Prestwich 1988). This study engages that literature at the level of intellectual and medical history; a fuller integration with the social and cultural historiography of consumption in France has not yet been achieved and is acknowledged here as a limitation, addressed further in Section 2.

These substances remain significant contemporary public health concerns, a contrast that is presented here only to frame, not to validate, the argument developed below. Europe has among the highest prevalence of tobacco use worldwide, with smoking linked to lung cancer, cardiovascular disease, and respiratory illness, and responsible for more than 1.15 million deaths annually (World Health Organization (WHO) 2024a, 2025a, 2025b). European adults also report the highest alcohol consumption in the world, averaging 9.2 L of pure alcohol per year, with excessive use linked to liver disease, cardiovascular disease, mental disorders, and dependence, and to approximately 426,000 deaths annually in the WHO European Region (World Health Organization (WHO) 2024a, 2024b). Tea and coffee, by contrast, are generally regarded as benign or protective in moderation, associated with reduced risk of certain cancers (Nguyen et al. 2024), though excessive intake has been

linked to reduced bone density (Hallström et al. 2013; Zeng et al. 2022), increased stroke risk (Smyth et al. 2024), and symptoms such as insomnia, anxiety, and palpitations (Jin et al. 2016; Shirlow and Mathers 1985). Carbon monoxide poisoning remains a documented cause of unrecognised chronic exposure in domestic and occupational settings (Williams et al. 2025).

It is against this background that the work of Jules Héricourt deserves attention. A military physician turned experimental physiologist, close collaborator of Charles Richet (1850–1935), and a prolific populariser of science, Héricourt occupied a distinctive position at the intersection of clinical medicine, laboratory physiology, and lay science writing; his career and its relevance to the present argument are outlined briefly in Section 3. His 1904 book *Les Frontières de la Maladie*, and specifically its second book, devoted to intoxications of external origin, is the primary source examined here. This article asks three questions: how did Héricourt characterise the mechanism, evidence, and clinical presentation of latent intoxication for each of the five agents concerned; on what kind of evidence, if any, did he base these characterisations; and what, if anything, does his 1904 synthesis add to, or anticipate in, the longer historiography of chronic toxic exposure and public health. Sections 4 and 5 address the first two questions substance by substance; Section 6 turns to the third.

2. Sources and Method

This study adopts a qualitative, historical-documentary approach, examining the medical conceptions Jules Héricourt presented in the early twentieth century regarding the abuse of alcohol, tobacco, tea, and coffee, and exposure to carbon monoxide. The analysis is based on close reading of the second book of *Les Frontières de la Maladie* (Héricourt 1904), supplemented by Héricourt's other publications for biographical and institutional context, and by secondary literature in the history of medicine, toxicology, and public health used to situate his claims. This type of approach is particularly suited to situating scientific ideas within their social, cultural, and institutional context, enabling an understanding of the evolution of medical thought over time (Bowen 2009; Denzin et al. 2023). Document analysis followed the qualitative content-analysis procedure proposed by Bardin (1977): pre-analysis of sources, material exploration, and interpretation of results, with source triangulation between historical and current scientific literature to reduce the risk of anachronistic interpretation (Kragh 2003; Goodson and Sikes 2001). Fidelity to Héricourt's original formulations was maintained through critical translation of excerpts.

A methodological caveat, central to the interpretation offered below, concerns the evidentiary status of Héricourt's own claims. *Les Frontières de la Maladie* was written for a broad, non-specialist readership and does not, for the most part, cite case records, patient numbers, experimental protocols, or other physicians' publications when describing the symptoms of ethylism, caffeinism, nicotinism, or carbon monoxide poisoning. Where the text can plausibly be read as drawing on Héricourt's own clinical experience, as a military physician and later director of an anti-tuberculosis dispensary, this is noted explicitly in Sections 4 and 5. Where, as is more often the case, no such basis is stated or can be inferred, this is treated here not as an incidental gap but as a finding in its own right: it indicates that Héricourt's authority in this text rested substantially on his standing as an experimental physiologist and public intellectual rather than on documented clinical evidence specific to these conditions. This distinction is essential to assessing what kind of historical source *Les Frontières de la Maladie* actually is, which is returned to in Section 6.

This study is also positioned, deliberately, at the level of intellectual and medical history rather than the social history of consumption. It engages most directly with the historiography of drugs, public health, and medical perceptions of psychoactive substances

(Courtwright 2001; Gootenberg 2022; Prestwich 1988). However, it also acknowledges the relevance of social and cultural histories of consumption, particularly those addressing alcohol and tobacco practices. In this regard, the French historiography of alcohol and tobacco, notably the contributions of Jean-Charles Sournia (1917–2000) and Didier Nourrisson (b. 1952), provides an important perspective on changing medical, social, and political representations of these substances in France. Likewise, recent scholarship on twentieth-century substance use and its regulation, such as Alex Mold’s work on Britain, expands the analysis towards the history of addiction, treatment, and public policy. These perspectives complement, while remaining distinct from, the present study’s primary focus on intellectual and medical history.

The historical photograph reproduced in Figure 1, originally published by Lahaie and Watier (2017), was digitally enhanced using Google Gemini 3.1 Flash Image (Nano Banana 2) to improve contrast, sharpness, and resolution for reproduction. No content was added, removed, or artificially generated; the enhancement was limited to standard image-quality adjustments.

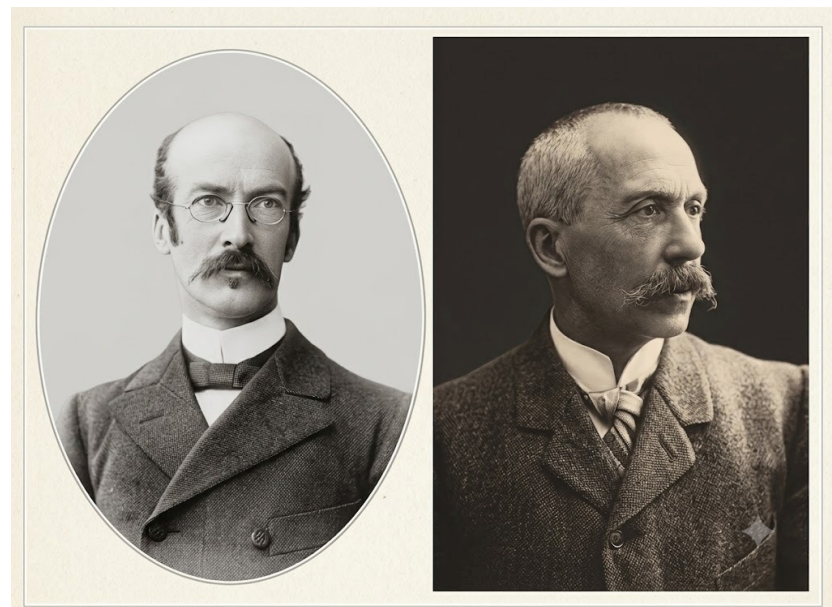


Figure 1. Jules Héricourt (left) and Charles Richet (right). Source: Rabelais Foundation—DBA of the University of Tours—Watier Collection. The photograph was reproduced in Lahaie, Y.-M.; Watier, H. *mAbs* 2017, 9, 774–780.

3. Héricourt in Context

3.1. A Military Physician and Popular Science Writer

Jules Héricourt (Figure 1) was born in Paris in 1850 and died there in 1938 (Paris Archives 2025a, 2025b). Trained at the Military School of Health in Strasbourg and the Val-de-Grâce School of Application, he defended his medical doctoral thesis in 1874 (Bibliothèque Nationale de France 2025) and spent over two decades as a military physician, serving in Algeria and northern France before his final resignation from the army was accepted in 1900 (ANF 2025). From 1885 he combined this career with extensive scientific journalism, serving as secretary of the editorial board of the *Revue Scientifique* and contributing to the *Revue de Médecine*, the *Revue des Deux Mondes*, and the *Revue Philosophique* (ANF 2025). He was a close friend of Émile Zola (1840–1902) (Héricourt 1890), testified on his behalf during the Dreyfus Affair in 1898, and co-founded the *Ligue des Droits de l’Homme* (League of Human Rights) the same year (Lahaie 2016; Naquet 2016). Between 1904 and 1934 he directed an anti-tuberculosis dispensary serving low-income populations

(Bonito 2022). In 1933 the Academy of Medicine awarded him the Albert of Monaco Prize, a decision that was not uncontroversial within the scientific community (Téry 1933).

From 1887, Héricourt spent fifteen years working alongside the physiologist Charles Richet (Figure 1) in Richet's laboratory at the Faculty of Medicine of the University of Paris, a laboratory rooted in the Claude Bernard tradition of experimental physiology (Héricourt and Richet 1888). Their joint research concerned serotherapy and the transfer of immune resistance through blood transfusion, work later recognised as an early conceptual step toward passive immunity (Lahaie and Watier 2017). This collaboration matters here for one specific reason: it establishes that Héricourt's scientific authority derived chiefly from experimental laboratory physiology and immunology, not from clinical toxicology, and that *Les Frontières de la Maladie*, published in 1904 while this collaboration was still active, was not a direct output of the Héricourt–Richet laboratory programme. The book's treatment of alcohol, caffeine, tobacco, and carbon monoxide accordingly stands apart from, rather than as a continuation of, his experimental work, a point that bears directly on the evidentiary assessment developed in Sections 4–6.

3.2. *Les Frontières de la Maladie* (1904)

Héricourt published *Les Frontières de la Maladie: Maladies Latentes et Maladies Atténuées* with Ernest Flammarion in 1904. Structured in six books and twenty-four chapters, it addressed conditions in which the boundary between health and disease was, in Héricourt's own terms, poorly defined, with transitions occurring imperceptibly. The book proved commercially durable, reaching twenty-nine editions by 1920 in French, Albanian, Asturian, Castilian, and English, and is held in eighty-two WorldCat member libraries worldwide (Héricourt [1850] 2021). This publication history indicates a wide and sustained lay readership, which is itself part of the article's interest in the book: it functioned less as a contribution to specialist toxicological knowledge than as a vehicle through which a physiologist of Héricourt's standing popularised, for a general public, a way of thinking about disease as gradual, cumulative, and often self-inflicted through habit. No systematic study of contemporary reviews or reader reception across its many editions has yet been undertaken; this is acknowledged as a limitation of the present study and a clear avenue for further archival research. The analysis below focuses specifically on the second book, devoted to intoxications d'origine externe.

4. Alcohol, Caffeine, and Tobacco: The Anatomy of Habitual Intoxication

Héricourt opens his discussion of intoxications of external origin with a general statement of their clinical logic, one that anchors the analysis of all three substances considered in this section:

Like auto-intoxications and toxemias of internal, cellular, or intestinal origin, intoxications of external origin may occur in varying degrees; more often than not, however, they develop gradually and persist over long periods at very low levels, in attenuated and only mildly troublesome forms, thereby remaining unnoticed. (Héricourt 1904, p. 105; author's translation)

This passage states, in one sentence, the argument this article attributes to Héricourt: that habitual, low-intensity exposure could produce disease without being registered as pathological until “accidents, sometimes severe” prompted the sufferer to seek medical advice. The three subsections that follow examine how Héricourt applied this logic to alcohol, caffeine, and tobacco, respectively, asking in each case what evidentiary basis, if any, is offered for the specific symptoms described.

4.1. Alcohol: Ethylism, Enolism, and Absinthism

Héricourt distinguished three related but non-identical conditions. Ethylism denoted the pathological state produced by prolonged, excessive consumption of distilled spirits (brandy, rum, cognac, kirsch, whisky, gin), encompassing both acute inebriation and chronic dependence. Enolism, following the physician Étienne Lancereaux (1829–1910), referred specifically to disorders associated with habitual wine consumption, in which potassium salts were thought to act on the liver and spleen, producing apparent congestion and signs of hepatic insufficiency. Absinthism, rendered by Lancereaux as *ousisme*, denoted the effects of habitual absinthe consumption, a spirit of 45–74% ABV distilled with *Artemisia absinthium* ([Plants of the World Online \(POWO\) 2026](#)) among other botanicals ([Farlex 2025](#); [Höld et al. 2000](#)), and was associated in particular with hallucinations, seizures, and dependency attributed to the compound thujone. None of these terms originated with Héricourt: Lancereaux had already elaborated the distinction between enolism and other forms of alcohol-related disease in earlier clinical writing ([Lancereaux 1878](#)), and the broader medical category of chronic alcoholism had been under discussion in France since at least the 1850s. Héricourt’s contribution, as discussed in Section 6, lay less in the taxonomy itself than in folding it into his broader argument about latent, externally caused intoxication.

Héricourt described ethylism as characteristically slow, subtle, and initially asymptomatic, progressing from digestive disturbance (reduced appetite, epigastric heaviness, morning nausea) to sensory disturbance in the limbs (nocturnal tingling, symmetric analgesia following initial hyperaesthesia), declining muscle strength and tremor, and disturbed sleep with “sad dreams and terrifying nightmares”. He further claimed that even mildly affected patients showed heightened vulnerability to nervous or cerebrospinal infectious disease. No case numbers, patient descriptions, or citations to clinical literature accompany these claims, nor does the text specify a quantity or duration of consumption required to produce them; the progression is presented as self-evidently observed rather than documented. This absence of stated evidence, consistent with the pattern noted in Section 2, cautions against treating Héricourt’s descriptions as clinical data rather than as a physician-populariser’s synthesis of prevailing medical opinion.

Héricourt situated enolism within the wider aperitif culture of early twentieth-century France, in which fortified, quinine-based aperitifs such as Byrrh and Dubonnet, herbal bitters such as Picon and Suze, and liqueurs such as Chartreuse and Bénédictine were consumed as part of everyday sociability. He treated the physiological effects of these products as broadly continuous with ethylism, distinguished chiefly by “pronounced nuances”, and emphasised symmetrical, ascending sensory disturbance in the limbs, with hyperalgesia and heightened reflexes.

The existing historiography of alcohol in nineteenth- and early twentieth-century Europe offers a fuller framework for situating this material than the source text itself provides. [Prestwich \(1988\)](#) has examined French anti-alcoholism politics of the period in detail, and [Sournia \(1986\)](#) and [Nourrisson \(2014\)](#) situate Héricourt’s taxonomy within a longer French medical and cultural history of alcoholism, one in which physicians had been debating the boundaries between ethylism, enolism, and related categories since well before 1904. Read against this literature, Héricourt’s classification appears less as an innovation than as a lay-oriented synthesis of debates already under way among French physicians, a point developed further in Section 6. A study equivalent in scope to [Harrison’s \(1971\)](#) social history of drink in Victorian Britain remains, to the author’s knowledge, unavailable for France specifically; this asymmetry in the national historiography is noted here as a limitation of the wider field rather than of the present study alone.

4.2. Caffeine and “Caffeinism”

Héricourt described excessive coffee consumption, three or more cups daily (Weinberg and Bealer 2001), as productive of a condition he termed caffeinism, encompassing acute symptoms (impatience, tremor, dizziness, palpitations, insomnia, headache, vomiting, diarrhoea) and chronic effects (epigastric heaviness, slow digestion, loss of appetite, constipation, general weakness, low mood, sleep disturbance, and, in prolonged cases, rhythmic tremor, muscular spasm, weak irregular pulse, melancholy, diffuse pain, and weight loss). He attributed these effects not to caffeine alone but to its combination with the aromatic compounds, tannins, and potassium salts also present in coffee, an attribution broadly consistent with later pharmacological work on caffeine (cf. Fredholm et al. 1999). Some contemporaries went further still, attributing impaired vision in older adults to habitual excessive coffee consumption (Kushner 2017).

Héricourt’s most analytically interesting observation concerns the cyclical resolution and recurrence of these symptoms: “A characteristic feature is that all these disturbances disappear, wholly or in part, after a fresh intake of coffee, only to reappear once the immediate stimulating effect has subsided” (Héricourt 1904, p. 107; author’s translation). Héricourt does not use any equivalent of the term dependence, and nothing in the text suggests he understood this cycle as anything other than a direct pharmacological effect of renewed stimulation; the passage nonetheless describes, in purely descriptive terms, a pattern of symptomatic relief and recurrence that resembles what is now understood, within a very different theoretical framework, as functional tolerance and withdrawal (Kooib and Volkow 2016). This is offered as an observation about the retrospective resonance of Héricourt’s description, not as evidence that he anticipated a modern concept of addiction, which the text does not articulate.

Héricourt further observed that coffee appeared better tolerated in warmer climates, noting that individuals accustomed to coffee in Algeria developed caffeinism symptoms on returning to France, and concluded that coffee and tea were “better suited to different climatic conditions”, the former to warmer, the latter to colder regions. This claim rests on impressionistic colonial comparison rather than on documented cases, and no historical or physiological source consulted for this study directly addresses human climatic tolerance to caffeine; DaMatta and Ramalho (2006), for instance, concern the response of the coffee plant itself to temperature and water stress, not human physiology, and are cited here only to note the absence of a more directly relevant source. Whether Héricourt’s climatic claim reflected genuine clinical observation, prevailing colonial medical opinion, or confirmation bias remains unclear; this ambiguity is itself indicative of the evidentiary looseness discussed in Section 2.

Unlike the alcohol section, caffeine lacks a French clinical counterpart with the specificity of Lancereaux; no equivalent contemporary treatise devoted to caffeinism as such has been identified for this study. Héricourt’s account is nonetheless legible against a wider, transnational medical discourse on nervous exhaustion. The American neurologist George Beard (1839–1883), in his influential *A Practical Treatise on Nervous Exhaustion (Neurasthenia)* (Beard 1880), had already identified tea and coffee among the aggravating causes of neurasthenia, a diagnosis that circulated widely among French physicians in the following decades and supplied a framework within which habitual stimulant use could be read as a disorder of the nervous system rather than, or in addition to, a digestive complaint (Gijswijt-Hofstra and Porter 2001). Read against this historiography, Héricourt’s caffeinism appears less as an isolated clinical curiosity than as a French, more narrowly physiological restatement of a stimulant-related nervous pathology that Beard and his followers had already systematised with greater theoretical ambition; Schivelbusch (1993) situates coffee and tea, alongside tobacco, within this same broader European history of

stimulant consumption and its medicalisation. This comparative context strengthens, rather than resolves, the evidentiary caveat noted above: Héricourt's specific symptomatic claims remain unsupported by cited case evidence, even once situated within a historiography that shows such claims to have been widely made by contemporaries.

4.3. Tobacco and Nicotinism

Héricourt attributed tobacco's effects chiefly to nicotine, alongside carbon monoxide, carbon dioxide, ammonium cyanide, and pyridine present in tobacco smoke, describing a condition he termed nicotinism: upper respiratory irritation, dry cough, reduced appetite, digestive disturbance, palpitations, and, distinctively, impaired recall of proper names. He held that nicotine's effects, unlike those of alcohol, were largely reversible on cessation, though he also described cases in which symptoms persisted or recurred in individuals who continued to frequent smoke-filled environments after quitting:

Thus one still sees persons who, having ceased smoking on the advice of their physician, nevertheless continue to present nicotine-related disturbances, because they have not ceased associating with smokers and spending more or less prolonged periods in smoke-filled rooms. (Héricourt 1904, p. 109; author's translation)

This is, in effect, a description of what would later be termed passive or second-hand smoke exposure, though Héricourt does not use any such term and offers no evidence beyond clinical impression that the mechanism he proposes, continued environmental exposure rather than relapse, was correctly identified.

Héricourt does not connect tobacco use to cancer, and the text shows no engagement with a framework of addiction or dependence comparable to the one implicit in his discussion of coffee; nicotinism is presented throughout as a graded physiological response to a toxic exposure, not as a compulsive behaviour. He also noted that coffee and tobacco use often compensated for one another, such that abrupt reduction in one could unmask symptoms previously attributed to the other, and recommended moderating both simultaneously rather than eliminating either abruptly. Whether this compensatory framing reflects genuine clinical observation or a plausible-sounding inference from the stimulant properties he attributed to both substances cannot be determined from the text alone.

Héricourt's nicotinism finds a much closer contemporary counterpart than his account of caffeine. The French physician Hippolyte-Adéon Depierris (1810–1889), in *Physiologie sociale. Le tabac, qui contient le plus violent des poisons, la nicotine; abrège-t-il l'existence? est-il cause de la dégénérescence physique et morale des sociétés modernes?* (Depierris 1898), had already argued, within a decade of Héricourt's own account, that habitual tobacco use produced physical and moral degeneration through nicotine poisoning, framing smoking as a matter of national vitality and hygiene rather than of individual choice, a rhetorical register close to the one Héricourt adopts for ethylism. Read alongside Depierris, Héricourt's nicotinism appears less as an idiosyncratic clinical synthesis than as a comparatively cautious, more narrowly physiological version of an anti-tobacco medical discourse already well established in France by the 1890s. The broader historiography of tobacco as a medical and social concern, examined comparatively by Goodman (1994) and, within a global framework, by Gilman and Xun (2004), situates this French debate within a wider European and Atlantic pattern of medicalising tobacco consumption; Nourrisson's (2010) history of the cigarette in France extends this account into the twentieth century and indicates that the moral-hygienic framing already visible in Depierris persisted well beyond Héricourt's own generation.

5. Carbon Monoxide and the Urban Environment

Chronic, low-level carbon monoxide exposure was a frequently underestimated hazard of the domestic and urban environment at the turn of the twentieth century (Megaw et al. 2021). Héricourt's discussion of carbon monoxide differs from the preceding sections in one important respect: it is presented explicitly as a synthesis of contemporary chemical and toxicological literature rather than as a report of clinical observation. Its most direct evidentiary basis is the work of the chemist Henri Moissan (1852–1907), the first French recipient of the Nobel Prize in Chemistry in 1906, whom Héricourt cites directly and with whose research he was familiar (Tressaud 2006). Héricourt summarised Moissan's warning about low ambient concentrations of carbon monoxide in domestic and urban air in terms that capture the epistemological difficulty at the centre of the chapter: "M. Moissan showed that one was dealing with an almost elusive enemy, and one to which, very often, the physician could not trace responsibility" (Héricourt 1904, p. 112; author's translation).

Héricourt identified several sources of chronic, low-level exposure: domestic illuminating gas, which could contain 7–10% carbon monoxide and leaked through deteriorating pipes and hoses; modern air-regulated heating systems, whose efficiency gains came at the cost of higher carbon monoxide output in combustion gases, compounded by poorly sealed ducts and cracking cast-iron elements; and mobile stoves and fireplaces, in which cooling combustion gases reduced chimney draft and could be pushed back into rooms by wind or faulty backflow valves, all common features of domestic heating in this period (Tomes 1999). He described the resulting clinical picture as headache (worse toward evening), dizziness, fainting, and neuralgia, and, in severe or prolonged cases, paralysis, localised anaesthesia, persistent anaemia, exhaustion on minimal exertion and, in extreme instances, cerebral haemorrhage or acute mental disturbance, particularly in individuals who slept near defective heating appliances, drowsiness being, in his account, an early warning sign. He further considered urban industrial emissions, particularly from power plants, as a plausible additional source of ambient exposure across entire neighbourhoods, weakening the population's resistance to other diseases, including tuberculosis (Hamlin 1998).

Moissan himself died suddenly in Paris in February 1907, shortly after receiving the Nobel Prize in Stockholm; while the recorded cause of death was acute appendicitis, some later authors have suggested that prolonged laboratory exposure to fluorine and carbon monoxide may have contributed to his early death (Harrington 1920). This episode is included here not as evidence for Héricourt's argument but as an illustration of how contemporaries themselves understood, and sometimes disputed, the long-term risks of the exposures Héricourt was describing.

6. Discussion and Conclusions

As established in Section 3, Héricourt's scientific authority rested on his experimental physiological and immunological work with Charles Richet, not on documented clinical toxicology; *Les Frontières de la Maladie* stands apart from that laboratory programme. This matters for how the book should be read historiographically: it is best understood not as a report of new clinical findings but as an act of popularisation, in which an established experimental physiologist lent his authority to a synthesis, of uneven evidentiary quality, of prevailing medical opinion about habitual and environmental intoxication.

Héricourt's treatment of alcohol reflects the broader European medicalisation of alcoholism discussed in Section 4.1. His tripartite distinction between ethylism, enolism, and absinthism, derived substantially from Lancereaux rather than original to Héricourt, illustrates an attempt, common in this period, to classify chronic intoxication by specific physiological manifestation rather than treating "alcoholism" as a single undifferentiated condition. Some of his clinical descriptions, particularly of peripheral neuropathy and

digestive disturbance, remain broadly consistent with modern understanding of chronic alcohol-related disease; others, notably his attribution of hepatic effects to potassium salts rather than to ethanol and its metabolites, reflect the physiological limitations of his period. The case of absinthism illustrates especially clearly how a physiological category could be shaped as much by cultural anxiety about bohemian consumption as by clinical observation.

Héricourt's caffeine discussion, examined in Section 4.2, shows a comparable pattern: a broadly accurate description of acute stimulant effects and a suggestive, if theoretically undeveloped, description of a symptomatic cycle resembling tolerance and withdrawal (Koob and Volkow 2016), embedded in claims, such as the climatic-tolerance argument, that rest on little more than impressionistic colonial comparison. Lacking a French clinical counterpart as specific as Lancereaux's work on alcohol, Héricourt's caffeinism is best situated within the transnational discourse on nervous exhaustion associated with Beard (1880) and analysed historiographically by Gijswijt-Hofstra and Porter (2001), a context that shows his account to be a physiologically narrower restatement of concerns already widely articulated rather than an isolated observation. Contemporary epidemiology has since substantially revised the negative framing Héricourt applied to moderate coffee and tea consumption (Nguyen et al. 2024; Smyth et al. 2024; Zeng et al. 2022), underscoring the historical contingency of physiological interpretation: the same substance could be read, within a generation or two, as alternately or simultaneously hazardous and protective, depending on prevailing hygienic concerns and available evidence.

Héricourt's account of tobacco and carbon monoxide, discussed in Sections 4.3 and 5, is the clearest instance in the text of attention to involuntary and environmental exposure: his description of persistent nicotinism among non-smokers who frequented smoke-filled rooms anticipates, in descriptive terms only, later public health concern with second-hand smoke, and his synthesis of Moissan's chemistry situates domestic heating and urban industrial emission within a single framework of chronic, low-level toxic exposure. Neither observation was original to Héricourt, who explicitly credits Moissan for the carbon monoxide material, and neither is supported in the text by documented case evidence; their historiographical interest lies in how they were assembled and popularised together, under a single explanatory category of latent intoxication, for a broad readership, rather than in any specific medical originality. Unlike caffeine, nicotinism has a direct French antecedent in Depierris (1898), whose moral-hygienic framing of tobacco as a cause of physical and social degeneration Héricourt echoes in muted, more physiologically cautious form; read alongside the broader historiography of tobacco's medicalisation (Goodman 1994; Gilman and Xun 2004; Nourrisson 2010), Héricourt's nicotinism appears as a moderate restatement of an already well-established French medical discourse rather than an independent contribution.

Taken together, these patterns indicate that Héricourt's category of latent, cumulative, externally caused intoxication functioned primarily as a rhetorical and pedagogical device for a popularising physiologist rather than as a body of original clinical toxicology, a conclusion sustained by the specific evidentiary gaps identified in Sections 4 and 5 rather than asserted independently of them.

This emphasis on evidentiary weakness could be read as undermining the historical relevance of Héricourt's synthesis. However, the claim advanced here does not rest on the correctness of his clinical reasoning: it treats *Les Frontières de la Maladie* as a documented artefact of how a working category of latent, cumulative intoxication was constructed and popularised, a historiographical status that holds independently of the scientific validity of its specific claims. Whether, and how, contemporary readers actually received, endorsed, or resisted Héricourt's account of chronic exposure is a related but distinct empirical question, one this article does not attempt to settle; as noted in Section 3.2, no systematic study of

contemporary reviews or reader reception has yet been undertaken, and this remains an open avenue for further archival research rather than a claim made here.

What the book does illustrate, and what this article proposes as its principal historiographical contribution, is a widely read early twentieth-century French articulation of the idea that disease could result from prolonged, low-intensity, often unrecognised exposure to substances or agents encountered in ordinary domestic and social life, an idea that resonates, at the level of general logic rather than specific mechanism, with later models of chronic and cumulative toxic exposure. This resonance should be treated as suggestive rather than genealogical: no direct line of influence between Héricourt's popularising synthesis and later toxicological or public health frameworks is claimed, or has been established, here. The more modest and defensible claim is that *Les Frontières de la Maladie* offers historians a documented instance of how such reasoning was constructed and made persuasive to a lay readership at a specific historical moment. This instance contributes to broader histories of substances, health, and risk by complementing existing scholarship on alcohol, tobacco, and drugs in France and Europe, including studies of medicalisation, social regulation, and changing perceptions of consumption and addiction (Courtwright 2001; Sournia 1986; Nourrisson 2014; Mold 2008). Rather than proposing a direct genealogy, this article situates Héricourt's work within a wider historical field in which concerns about exposure, toxicity, and bodily vulnerability were progressively articulated through medical, social, and public health discourses.

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