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Wine is alive: the vitalist and theological roots of natural wine in 19th and 20th century Spain

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This paper explores the intersection of vitalism, theology, and science in 19th and 20th century Spanish winemaking, focusing on the influential figures of Lucio Bascuñana and Eduardo Vitoria. Both men were engaged in the complex debate over the nature of wine, particularly regarding its production and the use of additives during a period marked by industrialization and scientific advancement, but also by a conflict between natural and artificial wines. Bascuñana's radical rejection of additives and insistence on preserving the "living" essence of wine, influenced by vitalist and theological thought, is juxtaposed with Vitoria's more pragmatic approach, which sought to balance scientific methods with traditional winemaking practices, especially in the context of sacramental wine. Drawing on Bruno Latour's critique of the nature-culture dualism, the paper argues that both Bascuñana and Vitoria envisioned science not as a force of domination but as a partner in sustaining the natural vitality of wine. This study contributes to the historiography of enology by highlighting how debates on natural versus artificial wine in Spain anticipated contemporary concerns within the natural wine movement, emphasizing the ongoing dialog between tradition, scientific progress, and wine authenticity.

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Introduction

In the contemporary natural wine movement, winemakers often describe their product as “alive” or “living.” This language is not merely poetic; it expresses a philosophical position rooted in a rejection of the increasing mechanization and standardization of winemaking practices. Natural winemakers and commentators, like Alice Feiring and Nicolas Joly, emphasize wine’s character as a living entity distinguishing it from commercial wines that are chemically stabilized and stripped of life. They believe that industrial wines are “dead” in the sense that they are overly processed, while natural wines are “alive,” continuously evolving in the bottle and in the glass. In Spain, natural wine fairs like *Vino Vivo* (Living Wine) reflect this tendency. One of the oldest and most respected Spanish natural wine cellars such as *Barranco Oscuro* exemplifies this philosophy. As they state in their website presentation:

Wine can be cared for, it can be treated as the complex, delicate and living product that it is, or should be. If the person who buys a wine does so with the awareness of receiving something living, the task is easier, we do not treat living things in the same way as inert things, we must assume a certain responsibility.¹

This approach, which advocates for a deep connection between the winemaker, the land, the grapes, and the resulting product, presents wine as an evolving, vital entity, co-created by the winemaker and the natural environment. Here, the idea of wine being “alive” serves as both a quality marker and a rejection of industrial standards.

Historically, the notion of wine as a living organism, whose authenticity must be preserved through non-interventionist practices, is closely related to vitalism, a philosophical belief that living beings are governed by a life force beyond mere chemical or physical processes (Duarte 2021), echoing broader historical debates on the human-nature relationship (Glacken 1967). In the world of contemporary winemaking, vitalism manifests mostly in the figure of Rudolf Steiner, proponent of biodynamic agriculture. His biodynamic agricultural philosophy, developed in the 1920s, gained more traction in Central Europe, particularly in Germany and Austria, rather than in Spain at the time. In his initial lectures from June 1924, Steiner proposed that farming (and by extension, winemaking) should follow the natural rhythms of the earth and the cosmos. This approach treats both farms and vineyards as a living organisms governed by the same vital forces as human and animal life. According to biodynamic principles, the vitality of the soil and the plants are deeply intertwined, and practices that disturb this balance—such as chemical interventions—are to be avoided. Biodynamic winemakers, generally certified by *Demeter* or *BioDivyn*, believe that by respecting these vital forces, the wine they produce will not only be of higher quality but will also better reflect the character of the terroir (Phillips and Rodriguez 2006). This view sees the universe, and by extension, wine, to be imbued by an ethereal force that infuses life to raw matter, showing its clear vitalism in the division between inert and living matter (Smith and Barquín 2007).

In the case of natural winemaking, previous research has stressed the resistance of natural winemakers to certification despite consumer demand, which reflects a deeper philosophical stance (Alonso González and Parga Dans 2023). The reluctance to accept external definitions stems from their belief that wine cannot be fully captured by regulatory frameworks or technical specifications that separate the producer from the product, subject and object. In Latour’s (1993) terminology, this would involve a process of “purification” that betrays the essentially hybrid character of wine. Instead, they see wine as something that co-evolves with the winemaker, a living element that resists the purity and objectification sought by certifications. This perspective led me to investigate the historical roots of this vitalist view of

wine, which has deserved little attention hitherto in the histories of natural wine (Cohen 2013; Goldberg 2011).

The debate over natural versus artificial wine, though modern in its expression, echoes centuries-old discussions about the purity and authenticity of wine. In the 19th century, vitalism emerged as a reaction to the growing industrialization of wine production, which introduced practices and additives to traditional wines that have resulted in different practices being accepted differently in different regions. For instance, chaptalization, the addition of sugar to wine to raise alcohol volume, is currently allowed in northern Europe but forbidden in southern Europe. Other practices such as fortification or pasteurization are also now globally regulated, but they were once the subject of fierce debate. This shows that the adoption or rejection of different enological practices is a culturally mediated historical process, rather than a neutral or unmediated result of adoption of scientific best-practice by enologists. Moreover, debates about what constitutes a natural or artificial wine reflect a broader cultural conflict between a mechanized and artisanal visions of agriculture, where the goal was to maintain a wine’s authentic connection to the land and to human labor.

This paper examines how these debates about the nature of wine, its vitality, and the boundaries between natural and artificial, played out in Spain during the late 19th and early 20th centuries. This period is particularly significant because it saw intense discussions on what constituted authentic, natural, adulterated, or artificial wine, traversed by vitalist and theological ideas. In Spain, these debates were deeply intertwined with the country’s broader social, political, and religious dynamics, especially given the central role of the Catholic Church. The theological dimension adds complexity to the Spanish case, as Catholic views on nature and creation profoundly shaped attitudes toward agricultural and enological practices. The notion of wine as a divine creation—Christ’s blood—to be preserved in its purest form, resonated with vitalist ideas that rejected industrialization and technological interventions. In this context, winemaking became not just a question of craftsmanship but a moral and spiritual act, where altering the wine through additives or industrial processes was seen as tampering with its God-given life force.

In *We Have Never Been Modern*, Bruno Latour (1993) deconstructs the binary opposition between nature and culture, proposing instead that modernity is characterized by a proliferation of hybrids—phenomena that blur the boundaries between the natural and the cultural. In the context of Spanish enology and its different currents, this perspective is particularly relevant. Wine is the product of both natural fermentation processes and human cultural practices, such as cultivation, selection, and aging. Vitalist views on wine reject the strict separation of these realms, seeing the wine itself as a hybrid entity where organic processes and human labor coalesce. Latour’s idea that modernity falsely purifies these categories helps explain the resistance to additives in natural winemaking. By introducing technological interventions, the process is seen as “purifying” wine—removing it from its natural-cultural hybrid form and reducing it to a mere object subject to industrial control.

In Spain, where theological and vitalist ideas strongly influenced winemaking, this view was particularly pronounced. The rejection of additives, then, is not merely about maintaining purity in the natural sense, but also about preserving wine’s status as a “living” product—an entity in which nature and culture are inextricably linked, preserving immanence. This paper will argue that a shared notion of “life” permeates both Catholic and vitalist views of wine in Spain during this period. Both perspectives embraced a rejection of “progress” and industrialization, seeing

them as threats to the natural (religious) order. While today's natural wine movement positions itself as progressive and radical, it paradoxically shares some distinctive traits with the Spanish advocates of natural wine during the late 19th and early 20th centuries, who were rooted in conservative ideologies.

Vitalism, winemaking and 19th century Spanish enology

Vitalism, a doctrine emerging from the intersection of biology, philosophy, and mysticism, posits that life cannot be reduced to mechanistic processes alone. Instead, it involves a special, non-material force that governs the living world. This idea has roots in classical cosmology, particularly within Christian thought and medieval mysticism. Figures such as Meister Eckhart, Jakob Böhme, and Giordano Bruno contributed to this mystical understanding of life, emphasizing the infusion of divinity into the material world (Strick 2009). Vitalism built on these ideas, suggesting that life's essence was deeply connected to spiritual and metaphysical principles, which helped shape biological thought in opposition to the materialist views of the Enlightenment (Poulat 1962).

During the 18th and 19th centuries, vitalism became an influential counterpoint to the emerging trend of mechanistic biology. Key figures like G.E. Stahl, P.J. Barthez, and X. Bichat argued for a "vital force" that organized and sustained life, distinguishing living beings from inanimate matter (Duarte 2021). This vital principle, they suggested, was the driving force behind biological processes, such as growth, development, and healing. Hans Driesch, a key proponent of late 19th-century vitalism, introduced the concept of "entelechy"—an organizing force that explained biological development in ways that purely physical processes could not. Driesch's ideas stood in contrast to the emerging dominance of physicalism, which aimed to explain life entirely through physics and chemistry (Stollberg 2015). This mechanistic shift marked a broader transition in how nature was conceptualized. Merchant (2013) traces this transformation in the early modern period, demonstrating how Enlightenment science progressively replaced organic, life-infused models of nature with mechanistic frameworks that viewed natural processes as predictable and manipulable. The rise of industrial winemaking and its reliance on chemical interventions can be understood as part of this historical trajectory away from vitalist principles and toward a reductionist understanding of fermentation as a merely biochemical process.

The relevance of the study is underscored by the central role of Spain as the dominant global wine exporter from 1860 to 1930, surpassing both France and Italy (see Anderson et al. 2017). Spanish exports surged dramatically in the 1880s and 1890s, driven by the phylloxera crisis in France, reaching their highest recorded levels of nearly 7 million hectoliters. Unlike Italy, whose exports fluctuated more moderately, Spain maintained a consistently high volume even as French vineyards recovered and protectionist policies took effect. Despite some declines in the early 20th century, Spain remained the leading exporter throughout the period, underscoring its central role in shaping global wine markets during this transformative era. As shown by Simpson (2003) wine was a cornerstone of Spain's agricultural exports during the late 19th and early 20th centuries. Products of the vine—including table wine, sherry, and spirits—consistently represented a substantial share of Spain's total exports. In 1885–89, vine products accounted for approximately 33% of total exports, highlighting their central role in Spain's trade economy. Around 20.9% of Spain's total wine production was exported between 1901–1909, though this declined to 10.8% by 1930–1935, reflecting shifting market dynamics and growing domestic consumption. Despite this decline, viticulture remained a crucial

sector, particularly in regions like Catalonia, La Rioja, and Andalusia, where it supported employment and rural economies. These figures underscore Spain's reliance on viticulture as a primary export industry during the period studied.

Vitalism in 19th-century France played a significant role in shaping debates around natural versus artificial winemaking. Vitalists believed that certain natural processes, like spontaneous fermentation, were intrinsic to the authenticity and "life force" of the wine (Benton 1974). These views held that wine should undergo fermentation naturally, using the yeast present on the grapes, without the addition of external substances such as sugar or sulfur, which were considered artificial adulterations of the wine's inherent vitality. This vitalist perspective aligned closely with traditional winemaking practices, where nature was allowed to take its course as an "organizing principle", in contrast to the industrialists who embraced artificial techniques for profit-driven mass production. Artificial practices like adding sugar or chaptalization, fortifying wine with alcohol, or using chemical preservatives, were seen as violations of the wine's "vital force" and contributed to the ongoing tension between preserving natural authenticity and embracing modern, industrialized methods of production.

The figure of Louis Pasteur, renowned for his pioneering work in microbiology, is often mistakenly associated with vitalism, even though his scientific discoveries were grounded in a rejection of mystical explanations for fermentation. Pasteur's work was especially influential in highlighting the role of microorganisms in fermentation, leading him to describe fermentation as "life without air," since he demonstrated that it only occurred in the absence of oxygen (Strick 2009). His research directly challenged mechanistic theories that attributed fermentation to chemical agents or catalysts within cells, as advocated by figures such as Berzelius and Liebig (Chen 2024). Instead, Pasteur's findings supported a more organic understanding of fermentation, where living cells played an irreducible role in the process.

Pasteur concluded that fermentation was a "vital action" (Reber et al. 2023). Thus, although his work debunked earlier vitalist ideas about fermentation, some contemporaries and later interpreters conflated Pasteur's findings with vitalism. They believed that his focus on living organisms affirmed the special, life-affirming quality of wine, reinforcing the belief that wine was, in essence, a living substance. It is important to highlight that Pasteur himself did not endorse a vitalist framework and instead embraced the manipulation of life processes to improve wine quality, most famously through pasteurization to ensure wine's preservation through sterilization. This emphasis on control contrasted with the more passive, reverent stance of theological vitalism, which feared that such interventions could destroy or alter the divine essence of the wine and its living force.

The traditional, pragmatic view of wine in Spain as a living creature echoed this vitalist belief. For many rural winemakers, wine was a product of nature, nurtured by human hands but essentially following its own organic course. Fermentation was not only a chemical reaction but a natural miracle that should be allowed to happen with minimal intervention. This was a deeply applied philosophy of winemaking, where additives or mechanical adjustments were seen as tampering with the natural order of things. Treatises of the time already noted this commonhold belief among winemakers:

Winemakers and enologists vividly describe the aging process, comparing the barrel to a cradle that nurtures the wine from infancy to maturity. Once it reaches adulthood, it must be transferred to the bottle, where its slow evolution continues, allowing esters to develop while preventing the wine from declining into decrepitude (Manoso de Zúñiga y Enrile and Díaz y Alonso 1895, p. 132).

Vitalism found its stronghold in the Andalusian region of Jerez, renowned for its production of sherry wine. Unlike the industrialization of wine in regions like Rioja, which attracted French investments, and Catalonia, Jerez remained relatively untouched by such developments. This lack of industrialization allowed Jerez to preserve its historical winemaking traditions, which were deeply tied to craftsmanship and the unique *criadera* and *solera* system. This traditional wine aging method, coupled with the mysterious influence of the *velo de flor* yeast, which floated on the surface of the wine, added a mystical quality to the process. This emphasis on natural, almost spiritual elements of winemaking reinforced the vitalist perspective, viewing wine as a living entity with its own life force, and thus preserving a cultural heritage that resisted purely scientific or mechanistic interpretations of winemaking. The words of a famous doctor and surgeon from Puerto de Santa María, Federico Rubio, clearly expressed this view. In the prologue to Rubio's conference collected in the book *Vindication of Sherry Wine*, Gumersindo de la Rosa tried to summarize in plain language the vitalism accorded to sherries by Rubio:

The eminent Doctor Rubio, in his brilliant improvisation, described these exquisite wines as truly living liquids—substances possibly analogous in nature to blastemas and plasmas, and therefore capable of exerting unique effects on the human body. He could only have been referring to wines capable of aging, those that undergo a long and complex development, evolving through a series of transformations akin to vital processes. These wines attain their essential characteristics through progressive changes, reaching a state of maturity—their 'adult age'—a quality exclusive to the singular nectar produced by our privileged vines (Revueltas Carrillo y Montel 1883, p. 36).

Then, Rubio's intervention explained the issue at length:

Wines are living liquids, possibly even organized substances. This is not a mere metaphor. When I say they are living, I mean they possess life in the same way as blood or milk. ... A living thing is one that undergoes continuous transformation—first progressive, then regressive—affecting its form, properties, and material composition. These changes begin with birth, continue through growth and development, are followed by a phase of stability or equilibrium, then decline, and ultimately end in decomposition and death. All of this occurs within the substance itself, driven by an internal force that interacts with external conditions, absorbing and expelling elements in a dynamic exchange. Natural and authentic wines exhibit all these characteristics. They originate from organic and living substances, such as grapes, and are born through the tumultuous process of fermentation—unlike isolated alcohol or glucose, which remain stable, inert substances without further evolution. Instead, wine is a highly complex body whose many components could not exist in a state of simple chemical dissolution without precipitating and decomposing. ... Furthermore, just as in other living beings, wine is subject to accidental disturbances, manifesting in pathological forms that bring about disease (Revueltas Carrillo y Montel 1883, pp. 80-81).

The text clearly presents a vitalist argument of "organized" living wine in opposition to a mechanistic view of isolated "chemical" components. Rubio's portrayal of wine as a living substance—subject to cycles of growth, equilibrium, decline, and eventual death—evokes a homeopathic perspective. This approach parallels that of the human body, implying that imbalances in the "life" of wine can manifest in pathological forms (Kuzniar 2016). Deepening the analogy, Rubio's emphasis on wine's living nature contrasts with "allopathic" methods of winemaking, where intervention from the start organizes the wine's development. In contrast, Rubio's view aligns with the practice of restoring the wine's original state using its own

"substances"—a principle that influenced Spanish winemaking regulations up until 1895.

After this point, however, the shift towards chemical treatment took precedence, marking a departure from the vitalist philosophy in favor of a more mechanistic and standardized approach to winemaking. Indeed, scientific enologists began to challenge and debate these traditional views. Between 1875 and 1899, nearly twice as many enology books were published in Spain as in the entire period from 1750 to 1875 (Pan-Montojo 2001). Between 1803 and 1880, 80 enology treatises were published, and between 1880 and 1901, 70 more, demonstrating the intensity of this debate within the Spanish viticulture industry (Bajo Santiago 2003). Influenced by the developments in chemistry and microbiology, particularly those of figures like Louis Pasteur, they sought to dissect the chemical properties of wine, analyzing its components to understand and manipulate the fermentation process. For most of these scientifically-oriented Spanish enologists, wine was a liquid with measurable properties, no different from other substances that could be artificially reproduced by controlling the precise environmental conditions. Their view stood in stark opposition to the more mystical and religiously influenced perceptions of wine as a "living" entity.

The tension between these winemaking paradigms created a divide within Spanish enology. Some enologists, particularly those influenced by vitalist and religious traditions, clung to the idea that wine was a unique product of nature, whose qualities could not and should not be replicated or altered artificially. Others, more aligned with modern scientific thought, believed that wine's chemical properties could be isolated and replicated to ensure consistent production. Disagreements among enologists and scientists about wine's qualities was such that, in the 1870s, a treatise by Creus y Corominas was devoted to the main disputes and conflicting views surrounding winemaking:

The perplexity and confusion that inevitably arise in the minds of those who dedicate themselves to the study of VITICULTURE and VINIFICATION—due to the wide diversity of opinions and the conflicting systems found among the various authors who have written on these specialized branches of agriculture—led me to conceive the idea of compiling the principal perspectives. By presenting them side by side in a structured classification, I aim to facilitate their comparative evaluation, seeking either to harmonize their contradictions or to establish a balanced middle ground between them (Creus y Corominas 1873, p. 7).

In Latour's (1993) sense, vitalists sought to preserve the ontological "immanence" of wine, while modern enology enacted a process of purification that, like other modern endeavors, produced a hybrid form—contemporary wine, a mix of added synthetic and organic additives, and natural grapes. The process sparked debates, primarily vitalist in essence. There were three main positions: the first argued for leaving wine untouched as a natural product; in a reminiscence of Hippocratic "humoral" theories; the second supported preserving wine's "substance" by intervening to balance its composition with additives intrinsic to it—that is, non-synthetic grape derivatives—like tartaric acid, grape must, grape alcohol or tannins. The third, modern view, advocated controlling wine's components with additives not intrinsic to its nature to ensure its quality and reproducibility. Opponents of vitalism and theological views, favoring modernization, argued that nature could be "imperfect" and thus required "help" and "improvement" to preserve its essence, paving the way for the contemporary notion of wine's "defects":

The term *mejoramiento* (improvement) has many advocates in enology, but it also faces staunch opposition from viticulturists who vehemently resist its application. The deep-seated traditions, ignorance, and prejudices of old winemakers—who oppose the enhancement, fortification, and artificial fragrance of wines

embraced by modern producers—lead the unsuspecting public to believe, with the blind faith of a village priest, that wine should remain untouched. To this end, they proclaim: “Do not drink the wines of Mr. So-and-So, for they have been improved and tampered with. Mine, on the other hand, are natural and pure”—even if they are sour, cloudy, putrid, or one of those unfortunate brews ruined by lactic fermentation. “For all I do is press the grapes, pour the must into fermentation vessels, and leave it there until it turns into wine”—as if nature’s work were always sufficient and did not, at times, require the guiding hand of science and human intervention to achieve its full potential (López Camuñas 1876, p. 53).

The legal texts regulating wine in Spain from 1892 and 1895 still supported the second view by allowing the “balancing” of wines with substances derived exclusively from grapes. My previous research (Alonso González 2025) has examined in detail how the increasing intervention of Spanish institutions in regulating wine purity, hygiene, and fraud reflected broader state efforts to control food safety and prevent economic adulteration. As we will see later, this would radically change in legal texts from the early 20th century, when the influence of industrialization and the rise of international markets began to clarify the dominant approaches allowing a growing number of additives and practices in winemaking.

Theological vitalism: the scientist-priest Eduardo Vitoria and the pragmatic view of natural wine

In the late 19th and early 20th centuries, Spain witnessed a convergence of theological, philosophical, and clergy-driven agricultural currents that together led to the rejection of modern winemaking that saw wine as a “living” entity. The convergence of theological and vitalist arguments advocating minimal intervention in winemaking resonates with historical debates on sustainability. As Warde (2011) illustrates, emerging ideas of sustainability historically encompassed moral imperatives that opposed unchecked technological intervention into natural processes—aligning closely with the ethical stance taken by figures like Vitoria and Bascuñana. Before them, influences such as Antonio María Claret, Isidoro Martínez de Bustos, and Miguel de los Santos Díaz y Gómara played key roles in promoting so-called “agrarianist” and traditionalist Catholic doctrines, which found resonance with vitalist ideas in winemaking. The Jesuit Agricultural Missionaries and figures like Félix Sardá y Salvany further spread these views, emphasizing the sacred connection between agriculture and the divine. At the heart of this movement was neo-Thomism, which sought to reconcile Christian theology with Aristotelian and Thomistic thought. This philosophy emphasized the intrinsic purpose and “vital force” of natural beings, a concept easily applied to wine, which was seen as more than a mere product but as a living substance, and was a product of first necessity for the Eucharist. This perspective aligned with the theological belief that natural processes, such as fermentation, reflected a divine order and should not be tampered with through artificial means. Notions that aligned with the “widespread rebellion” against the cult of science and technology at the time that found resonances beyond Catholicism in Romanticism and other cultural trends (Thompson 2009).

The figure of the scientist-priest emerged strongly throughout the late 19th and early 20th centuries in Spain, embodied by figures such as Zeferino González, a Catholic priest, among many others (Navarro 2018). This endeavor was not devoid of conflict, as liberal and progressive thinkers thought that the all-powerful Spanish Church was responsible for the lack of adoption of scientific theories and practices in Spanish industry and society. The most prominent debates about wine as a natural product took

place in the Jesuit newspaper devoted to scientific topics *Razón y Fe* (Reason and Faith). A key figure in these debates was Eduardo Vitoria Miralles, a Jesuit chemist, PhD at the Catholic University of Lovaine (Belgium), who created and led various major chemistry institutions in Spain such as the Chemical Institute of Sarrià. This is not surprising given the Belgian Jesuit influence giving rise to religious-scientists. Prominent in theological journals such as the *Revue des Questions Scientifiques*—Neo-Thomism found fertile ground not only in Spain, but also in France and Italy, where it informed debates over science’s proper role in agriculture and winemaking. In Italy and France, as in Spain, Catholic authorities, Neo-Thomist intellectuals, and emerging agronomical experts grappled with the extent to which modern science should be permitted to shape winemaking practices. In Italy, journals such as *La Civiltà Cattolica* debated the “purity” of sacramental wine, illustrating a shared concern that excessive chemical manipulation might erode the product’s inherent “living” essence. Meanwhile, French venues, including the Jesuit journal *Études*, showcased an analogous dialog: on one hand, Pasteur’s discoveries were praised as affirming nature’s orderly design, yet on the other, critics feared that chaptalization or heavy fortification threatened the sacramental or “vital” character of wine.

In this broader European context, Vitoria played a central role in defending the purity of natural wine, especially in the context of the Eucharist during the early decades of the XXth century. In a series of works published first in *Razón y Fe* and then in book form (Vitoria Miralles 1909, 1930, 1944), he highlighted the convergence of scientific expertise and theological doctrine, advocating for winemaking practices that respected both the chemical purity of the wine and its theological significance as a “living” product of divine creation. Indeed, for him, the key historical moment in enology was when Pasteur “established his vitalist doctrine, according to which the alcoholization of sugar is a real effect of cellular nutrition, not merely an accidental byproduct of life” (Vitoria Miralles 1944, p. 73).

Besides ascribing a vitalist stance to Pasteur that he would probably have rejected, Vitoria made a crucial distinction between valid and licit wine for the Eucharist, which was especially significant during a period of intense debates over natural and artificial wine. For Vitoria, the *validity* of Eucharistic wine required that it be natural, derived solely from grapes, and free from any alterations or adulterations. Only wine that met this criterion could fulfill the sacramental function, ensuring the presence of the divine in the ritual. He therefore concluded that:

Any substance that interferes with the natural fermentation of wine—such as the introduction of bacteria or *mycodermas*—or alters its original composition must be strictly excluded from its production. Consequently, the use of gypsum, sucrose, artificial glucose (or glucose derived from other sweet fruits), colorants and decolorants, tannin, sulfiting, and antiseptics in general should be prohibited. Likewise, most clarifying agents—including gelatin, blood, chalk, marble, eggshells, shells, and cream of tartar—should not be permitted in winemaking (Vitoria Miralles 1944, p. 79).

He also specifically rejected petiorization, chaptalization, gal-lization, fortification, sheelization, and clarification practices that add foreign substances permanently. However, beyond mere *validity*, sacramental wine also needed to fulfill the quality of *licitude*. Licitude referred to wine being prepared and handled according to liturgical rules, as well as being sourced from approved suppliers. This licitude was important to guarantee that the wine not only met the theological requirements (validity) but also adhered to ecclesiastical guidelines, further reinforcing the Church’s control over its use. In the context of widespread wine adulteration, where artificial additives often compromised both the substance and integrity of wine, Vitoria’s emphasis

Table 1 Table contrasting the “Vitalist” and “Artificial” views in winemaking, highlighting key aspects such as fermentation, additives, science, authenticity, theology, sustainability, and industrialization.

Aspect	Vitalist view	Industrial view
Definition	Wine is a living entity, evolving naturally	Wine is a chemical product that can be optimized
Fermentation	Spontaneous fermentation using indigenous yeasts	Controlled fermentation with selected yeasts
Use of additives	Minimal or no additives; rejects chemical interventions	Additives (e.g., sulfites, acids, sugar) enhance stability
Role of science	Science should observe and respect nature, not alter it	Science improves and standardizes production for quality control
Authenticity	Wine must retain its original, natural essence	Wine quality is defined by consistency and stability
Religious perspective	Wine is a divine creation, reflecting God’s natural order	Wine is a product of human ingenuity, not divine essence
Sustainability	Sustaining nature’s balance is key to winemaking	Sustainability achieved through technological efficiency
View on industrialization	Industrialization disrupts the natural process and degrades quality	Industrial methods enhance production and economic viability

highlighted the Church’s resistance to such industrial practices, underscoring a preference for purity and tradition.

For Vitoria, the widespread use of *mistelas* or unfermented sweet musts was a mistake as those liquids, although valid, were not licit for liturgy. Grape musts could be pasteurized or cold-concentrated, but given that yeasts would surely die in the process, they required to undergo fermentation to become “licit” material for liturgy. Then, under the influence of changes in the official doctrine of the Catholic Church, he shifted position from his 1909 rejection of the addition of sulfites to liturgy wine towards a more open stance. Nonetheless, he pointed out that sulfites should be added in the grape must and before fermentation, never in the finished wine (Vitoria Miralles 1944, p. 147). Vitoria eventually justified the use of additives like sulfites and artificial yeasts for pragmatic reasons. He acknowledged that while figures like Baldomero Ghiara and Lucio Bascañana had proved natural winemaking without inputs was possible, most winemakers lacked the knowledge and perseverance to achieve this:

Small-scale winemakers have no need to sulfite their musts if they are producing only a few barrels for private use or for a small circle of friends. By adhering to rigorous cleanliness, carefully selecting grapes, properly sanitizing the press, containers, and cellar, they will undoubtedly succeed in crafting a wine that is both rich and pure—worthy of the high status to which it will be elevated. Even for harvests of 200–300 hectoliters, Mr. Ghiara affirms, and Dr. Bascañana corroborates, that meticulous hygiene, attention to detail, and the diligence of the winemaker are sufficient to produce excellent, unadulterated wines, even in hot regions such as the mountains of Málaga. How much more achievable must this be for small-scale winemakers, many of whom produce wine for consecration? This is what nature dictates: that everything should occur naturally and spontaneously. However, it must be acknowledged that achieving this requires not only technical skill but also a winemaker’s spirit—a commitment to cleanliness, constant vigilance, and an appreciation for the painstaking process of winemaking. Since few possess all these qualities, many resort to artificial interventions to accomplish with ease what could be achieved naturally, albeit with greater effort. For most winemakers, therefore, the use of sulfur will remain nearly indispensable to ensure the proper preservation of their musts (Vitoria Miralles 1944, p. 167).

Therefore, despite upholding the ideal of natural wine, Vitoria recognized that additives were necessary in practice to ensure wine quality and preservation (see Table 1). Both Bascañana and Ghiara remained more radical in their advocacy of natural wine without additives. Lucio Bascañana was a PhD in pharmacy and a prominent figure in late 19th- and early 20th-century Spain, serving as the director of the School of Commerce in Cádiz. A devout Catholic, Bascañana was deeply aligned with radical

conservative and Carlist Monarchist ideologies. His views were influenced by a staunch defense of traditional values, both in his scientific work and his religious beliefs.

Bascañana’s writings and teachings often reflected his opposition to the liberal ideas of progress and industrialization, especially in areas such as winemaking, where he favored natural methods and minimal intervention, in line with vitalist and theological principles. In response to an article by Eduardo Vitoria regarding the wine used in Mass, Bascañana published two articles that engaged with Vitoria’s views. The first, titled *La Falsificación del Vino de Misa* (The Falsification of Eucharist Wine), and the second, *Más sobre el Vino de Misa* (More about Eucharist Wine), both addressed the validity and licitness of winemaking practices for sacramental use. In these writings—that would resonate with any contemporary natural winemaker—Bascañana firmly argued that it was not licit to add external yeasts to the wine used for the Eucharist, directly opposing Vitoria’s more pragmatic approach:

By sterilizing must and adding selected yeasts, a liquid is obtained that the trade refers to as wine. However, this product undoubtedly differs in chemical composition from wine produced through spontaneous fermentation. The reason lies in the fact that selected yeasts consist of biological species and strains that, both in quality and quantity, differ from those that would naturally result from the must’s elective affinity for indigenous yeasts. Artificial wine, cultivated wine, selected wine, fantasy wine—any of these names, or even more whimsical ones, could be applied to these commercial wines that reflect scientific and industrial progress. However, the term *natural wine* applies only to grape juice that has undergone spontaneous fermentation, following the method that (with all certainty) would have been used by the Patriarch Noah, and when Our Lord Jesus Christ instituted the August Mystery (Bascañana y García, 1914).

Despite Bascañana’s open recognition of the merit of Vitoria’s work, he did not endorse the justification of the chemist-priest for the use of additives like yeasts for pragmatic reasons. Bascañana argued that such interventions violated the natural purity required for sacramental wine, marking a significant divergence in their views as early as 1914. But Bascañana’s views went beyond a purely liturgic argument. His view was that industrial winemaking could not be called “natural” as such, and that the industrial wines that were becoming commonplace in Spain should be given a different definition:

Most wines currently available on the market ... while they may constitute valid matter, are not licit for the August Sacrament. ... The Royal Decree of December 2, 1908, in line with scientific progress, permits a number of wine manipulations from a hygienic standpoint, aimed at producing wines that meet the taste preferences of different consumer sectors. Due to this legal authorization, and the ease with which these wines—processed

through modern industrial methods—are marketed and preserved, all contemporary wineries subject their wines to one or more of these permitted manipulations. Yet, these interventions modify the chemical and biological composition of the must and wine to such an extent that the final product is undeniably different from what would have been obtained had the vinification process occurred solely through the spontaneous fermentation of natural grape juice, without any addition or removal of foreign substances (Bascuñana y García, 1914).

Natural wine and industrial asepsis: Ghiara's experiments and Bascuñana's vitalist legacy

Bascuñana's 1909 text "The Falsification of Eucharist Wine" inspired Baldomero Ghiara, a watchmaker and enologist from Málaga, best known as uncle and patron of painter Pablo Picasso, to plant a vineyard and begin experiments to produce an entirely pure natural wine. Although not inspired by Catholicism, he published the results of his experiments with the support of Bascuñana, summarizing his vision of natural wine as a product made through "industrial asepsis", that is, with maximum hygiene but without additives, clarifications, interventionist physical processes, or any type of filtration:

It is thus well demonstrated that natural dry or sweet wine can be obtained from Pedro Ximénez grapes grown in the Montes de Málaga, requiring nothing more than the strictest cleanliness in all stages of production—what we may rightly call *industrial asepsis*. Our experiments have shown that these wines do not require enhancements from selected yeasts or the addition of any substances, not even clarifying agents. Some of these agents, which are commonly believed to act through purely mechanical means, may in fact leave behind residues that become incorporated into or chemically bound with the wine (Ghiara et al. 1917, p. 57).

His humble aim was to set example for future natural winemakers:

If science, by systematically experimenting with the results of my practice, ultimately confirms the validity of these findings and proves that it is economically viable to produce natural wines that are both healthy and pleasing to the palate—without the need for chemicals, additives, alcohols, or syrups; in short, by relying solely on meticulous care, cleanliness, and pure spring water for sanitation—then I will have achieved something that may not be fully appreciated today but will surely be recognized in the future (Ghiara et al. 1917, p. 60).

Interestingly, he was one of the winemakers chosen to respond to a 1912 nationwide Spanish survey set out by the General Directorship of Agriculture, Mines and Forests, which aimed to settle the longstanding qualm between natural, artificial and adulterated wines. The survey asked representative winemakers various questions, including the following:

1. What composition and conditions must wines meet to be considered natural and healthy?
2. What substances and in what proportion should be allowed to be added to the musts and wines to facilitate their manufacture, preservation, and improvement, without losing their healthiness?
3. What measures should be taken to prevent and combat wine adulteration? (Ghiara et al. 1917, p. 134).

He replied to the first question by simply defining natural wine as "the fermented juice of fresh grapes", arguing that:

The second question has already been addressed in my previous response, as I believe I have demonstrated that there is no need to permit the addition of any substance for winemaking (I do not consider the term "manufacture" appropriate), nor for

preservation, and even less so for so-called improvement. The wines produced in this manner are not only highly enjoyable but also perfectly healthy (Ghiara et al. 1917, p. 138).

His response to the third question revealed his differences with the views of Vitoria and Bascuñana, firm believers in the need to reinstate tradition and resist the industrialization of winemaking. As a liberal progressist, Ghiara considered the empowering of winemakers through associations and cooperatives fundamental, a topic to which he devotes a whole chapter:

Like everyone else, I am fully aware of the existence of fraud and the severe harm it inflicts on agriculture and fair commerce. However, the remedy for this issue is not within our grasp today—nor within that of the courts, or even the government itself. Addressing it requires a fundamental change, or rather, a radical transformation in our very way of being (Ghiara et al. 1917, p. 138).

His book ended with a section where Bascuñana offers an analytical report of his 12-year experimentation in the large-scale production of natural wines, where he goes in-depth into enological analysis to highlight their quality and lack of defects. Bascuñana again underscored the proselytist character of Ghiara's efforts, by concluding that his work remained unfinished because of the "effort it takes to make other winemakers see that excellent wines can be obtained without the intervention of Chemistry, such a valuable and widely used aid by them on a large scale" (cited in Ghiara et al. 1917, p. 75).

After Ghiara's death in 1924, Bascuñana continued his work, notably intensified by the establishment of the progressive Spanish Republic, which enacted the most comprehensive wine law Spain had ever seen in 1932, the Wine Statute. The Republic stood in direct opposition to Bascuñana's staunchly monarchist views, further fueling his radical resistance to the Republic's modernizing influence on winemaking practices. His vitalist views were summarized in a series of academic seminars about wine in 1933. Bascuñana criticized the 19th-century scientific reliance on mechanistic and materialistic explanations, particularly polygenism and spontaneous generation, which he saw as undermining the divine role in life processes. He contrasted these views with the work of Pasteur, whom Bascuñana interprets as a Catholic believer restoring the role of living organisms in winemaking. Pasteur's work in fermentation reaffirmed the spiritual and vital essence of winemaking, positioning it as a process led by living beings rather than artificial interventions: "His experiments were definitive in demonstrating that the cause of fermentations lay in life germs that were part of the dust particles suspended in the air" (Bascuñana y García 1933, pp. 25–26). His vitalist definition of wine establishes a form of continuity with traditional Spanish layman understandings of it as a living being:

Wine is born when tumultuous fermentation ends, but it matures through slow fermentation, reproduces in the soleras, and eventually succumbs to disease or decrepitude. Thus, we can consider wine a living organism, undergoing all biological phases of growth and decline. Consequently, it can be defined as the transformation of ripe grape juice, brought about by a symbiotic community of natural microflora, whose activity is constrained by the chemical composition of its environment (Bascuñana y García 1933, p. 32).

Reaffirming his disagreements with Vitoria, Bascuñana emphasized that wines with added yeasts or sulfites should be considered artificial:

It is, therefore, not irrelevant whether wine is produced using selected yeasts, sulfur dioxide, or alkaline bisulfites (all authorized by the Statute), or whether it is obtained through the spontaneous fermentation of the must. The former results in an artificial wine, while the latter is a natural wine (Bascuñana y García 1933, p. 13).

His rejection of selected or artificial yeasts was predicated upon two main arguments. First, on the impossibility of imitating nature:

Nature's work cannot be imitated, for—as Pasteur himself stated—life remains a mystery to man: “Life is the germ, and the germ is life” in a wine (Bascuñana y García 1933, p. 13).

And second, on a question of authenticity and biological generation:

Thus, if we alter the yeast, we change the resulting wine; and if we modify the must, it follows that we fundamentally alter the nature of the wine it produces. This reflects the same phenomenon observed in the formation of all living beings: the resemblance to their progenitors—what biology refers to as inheritance (Bascuñana y García 1933, pp. 27–28).

He considered the Republican Wine Statute a “very dangerous weapon” that altered the natural and living character of wine, and divided the interventions it allowed “into three groups: A) those that act on the yeasts before fermentation; B) those that alter the composition of the must; C) those that modify the wine itself” (Bascuñana y García 1933, p. 35). Bascuñana laid the groundwork for future research on natural winemaking by positioning science not as an adversary, but as a collaborator in the winemaking process.

His approach to natural winemaking could be seen as a rejection of the sharp separation between nature and culture that traditional scientific paradigms often reinforce, which he saw in the top-down, controlling approach that had become prevalent in winemaking at the time. Instead of viewing scientific progress as an external force imposing itself upon the natural process of winemaking, Bascuñana, in Latourian terms, advocated for the hybridization of these realms. Science, tradition, and nature are not separate actors but are entangled in the process of creating wine as a living, dynamic entity:

Should we then abandon scientific intervention in winemaking and, along with it, forgo the benefits of legitimate progress? Certainly not. ... Science must play a role in winemaking, but it should do so by building upon the industrial practices handed down through tradition, organizing and investigating them systematically (Bascuñana y García 1933, p. 15).

His emphasis on tradition, far from being a nostalgic or anti-modern stance, aligns with Latour's idea of recognizing the active participation of nonhuman actors—in this case, grapes, soils, yeasts, and the traditional methods themselves—in wine production. Bascuñana implicitly resists the modern, mechanistic view that wine can be reduced to a set of chemical properties that can be controlled or replicated. Instead, his approach shows how human and nonhuman elements co-produce the final product:

Winemaking must adhere strictly to traditional methods. This should be the ultimate objective of the Spanish wine industry, which must be guided exclusively by our esteemed *Maestros de Bodega* (Cellar Masters), minimizing chemical interventions that do not originate from the scientific refinement of time-honored techniques—those very practices that earned our wines their global reputation (Bascuñana y García 1933, pp. 41–42).

This interpretation deepens Bascuñana's vitalism by framing it not as a rejection of science but as a more integrated and collaborative approach, where science learns from and works with nature and tradition. This view destabilizes the rigid boundaries between science and traditional knowledge, proposing instead a networked, co-evolutionary process where all actors—scientific, natural, and cultural—play a role in shaping the outcome.

Conclusion

This paper has traced the interplay of vitalism, theological thought, and scientific approaches in shaping early 20th-century Spanish winemaking, with figures like Lucio Bascuñana and Eduardo Vitoria offering unique perspectives. Both Bascuñana and Vitoria navigated the tension between preserving traditional, natural winemaking practices and embracing scientific

advancements. Vitoria acknowledged the role of scientific methods in improving winemaking but emphasized that any intervention should not alter wine's essential nature. His distinction between valid and licit materials for sacramental wine highlights the spiritual and cultural dimensions of the debate. Bascuñana, on the other hand, articulated a more radical resistance to the industrialization of winemaking, seeing science as a potential ally in maintaining the integrity of natural wine, rather than as a tool for mechanization and chemical intervention.

Through a Latourian framework, the work of both men can be understood as attempts to mediate the hybrid nature of wine, which straddles the boundaries between nature and culture. Latour's rejection of the rigid nature-culture binary provides a useful lens for understanding how Bascuñana and Vitoria viewed scientific intervention not as an intrusion but as a process that should coexist with tradition, guiding it without overshadowing the natural vitality of wine. This perspective sheds light on how these figures saw tradition as an essential part of the winemaking process, positioning science as a partner in preserving the “living” character of wine rather than transforming it into a product of industrial processes.

The insights provided here aim to enrich the historiography of enology by examining the roles of vitalism and theology in shaping the debates on natural wine. Advocates of natural wine today often invoke these historical and theological arguments, asserting that wine should be produced with minimal intervention to preserve its vitality and authenticity. In doing so, they echo a longstanding tradition that views wine not merely as a product of agricultural and chemical processes but as a living, sacred substance imbued with a unique life force. The enduring relevance of questions about authenticity, purity, and the role of scientific intervention highlight the reflections provided by the (generally forgotten) figures of Bascuñana and Vitoria. This demonstrates that the conversation between tradition and progress, far from being a modern phenomenon, has deep roots in the complex, hybrid world of winemaking, where science, culture, and nature are inseparably intertwined.

Data availability

No datasets were generated or analysed during the current study.

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Note

¹ <http://www.barrancooscuro.com/vino-natural/>.

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Author contributions

PAG was solely responsible for all aspects of the research and writing of this paper. This included the conception and design of the study, data collection, archival research, and analysis. PAG conducted all primary and secondary source investigations, drafted and revised the manuscript, and approved the final version for submission. All theoretical interpretations and conclusions presented in the paper are the author's own.

Competing interests

The author declares no competing interests.

Ethical approval

This research does not include human participants or their data.

Informed consent

There is no informed consent retrieved for this research.

Additional information

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