

# The Impact of the Spirit of the Scientific Revolution on Human Rights in Modern Constitutions

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**Abstract.** This paper explores the profound impact of the Scientific Revolution on modern constitutional law and human rights. It traces the evolution from early constitutional forms in classical antiquity to the transformative shifts introduced during the Enlightenment. The paper highlights the development of constitutional law from its rudimentary beginnings, such as the Magna Carta, to the more sophisticated frameworks of modern constitutions shaped by the Enlightenment ideals of equality, liberty, and democracy. The Newtonian Revolution's introduction of scientific rationalism—emphasizing skepticism, empiricism, and secularism—played a crucial role in shaping contemporary legal systems. This intellectual shift fostered the rise of legal positivism, which allows laws to evolve in response to societal changes, contrasting with the immutable nature of natural law. Ultimately, the legacy of scientific rationalism is evident in modern legal systems' adaptability and commitment to justice, balancing tradition with progress to address the complexities of contemporary society.

**Keywords:** Constitution, Newtonian Mechanics Revolution, Scientific Revolution Thought, Rights.

## 1. The Development of Constitutional Law

The origins of constitutional law are subject to various scholarly interpretations, but it is clear that rudimentary forms of constitutions existed as early as classical antiquity. The term "constitution" in modern usage traces its etymology to the Roman word *constitutio*. However, the concept underlying *constitutio* can be traced back to the earlier Greek term *politeia*. In ancient Greece, *politeia* was defined as the body of laws concerning the organization and authority of city-states. This included laws related to citizenship and civic duties, as well as the organization, authority, and responsibilities of legislative, executive, and judicial bodies within the city-state. Thus, the ancient Greek notion of "constitution" primarily referred to an actual political system or order of governance, focusing closely on the state's internal organization rather than on normative regulations.

During the Roman era, despite the existence of different "constitutional" systems across the monarchy, republic, and empire, Rome did not possess a formal constitution or constitutional laws in the modern sense. This indicates that, in classical European times, constitutions were in their nascent stage, characterized by being unwritten, incomplete, and unorganized.

As time progressed, the transition from slave-based politics in classical times to feudal politics brought about developments in constitutional law. By the medieval period in Western Europe, the highest rulers were largely dependent on hereditary succession and held lifelong positions. Consequently, autocratic rule remained prevalent in medieval Western Europe. However, this autocracy was significantly less centralized compared to the despotic regimes of Eastern monarchies. Western European feudal lords consistently sought to limit the king's autocratic power, often by signing special legal documents to define the scope of royal authority, and by employing parliaments or other specialized institutions to constrain royal power and protect their own interests. A quintessential example of this phenomenon is the Magna Carta, signed by King John of England in 1215 under pressure from feudal lords, clergy, knights, and city dwellers. The Magna Carta is considered one of the earliest constitutional documents in Britain, significantly curbing the king's power, upholding the judicial authority of feudal lords, and establishing the principle that the powers of the council were superior to those of the king. Moreover, the Magna Carta established the principle of governance according to law, laying the foundation for the legal limitation of royal power.

In contrast to classical European times, medieval constitutions were not only more systematically developed but also introduced the concept of power limitation. This indicates that the fundamental spirit of constitutionalism from its inception has been to restrict executive power (initially represented by royal authority and later evolving into restrictions on government power) and to implement the rule of law. On this basis, medieval constitutions represent the earliest form of modern constitutional politics.

In contrast to modern constitutions, medieval constitutions, although they did incorporate elements of power limitation, were still constrained by the limitations of their time. The most notable manifestation of this was the focus on preserving royal and ecclesiastical authority. During this period, the king was regarded as the representative of divine power granted by God, with the responsibility of protecting the Church and the faith. Although medieval constitutions did not explicitly enshrine these aspects in the same way as modern constitutions, the power dynamics and inequality of rights can be illustrated through the following examples.

Firstly, medieval constitutions often granted the Church a special status and authority. The king was typically seen as the protector and defender of the Church, responsible for safeguarding its interests and traditional beliefs. For instance, in canon law, the king was endowed with the authority to oversee and intervene in church matters to ensure its proper functioning.

Secondly, the medieval constitution frequently portrayed the king as a representative of God, endowed with divine authority. This perspective held that the king's rule was legitimate because he was seen as God's agent, with his authority derived from divine grant. Although this concept may not have been explicitly stipulated in constitutional texts, it was widely present in social and political practice, shaping the political and social order of the time.

In medieval Europe, many countries, including England, enacted a series of legal documents designed to limit royal power and protect basic rights of the people. However, the rights protected by these documents were limited in scope and application. For example, regarding human rights, the Magna Carta was the first legal text to formally articulate human rights. However, its protections initially extended only to the clergy, nobility, and free men, with free men constituting only 14% of the population at the time. Article 39 of the Magna Carta stipulated that: "No free man shall be arrested, imprisoned, dispossessed, outlawed, or exiled, or in any way harmed, except by the lawful judgment of his peers or by the law of the land." This provision indicates that while the law imposed certain constraints on the king, requiring him to respect basic human rights to some extent, the term "free men" primarily referred to feudal nobles, and thus, the freedom of the majority of laborers was not legally protected.

In terms of political rights, Article 14 of the Magna Carta specified: "No scutage or aid shall be imposed on the kingdom, unless by the common counsel of our realm," and Article 61 established a committee of 25 barons to oversee the king's adherence to the charter. These provisions indicated that without the participation of representatives, the king could not unilaterally impose taxes or aids. However, the oversight of the king's adherence to the charter was the responsibility of the barons, i.e., the noble class, and ordinary citizens were not granted this right.

Additionally, basic political rights such as voting and freedom of speech were restricted to a small number of families, with the majority of people confined within their social class and guilds. This effectively denied the broader population any meaningful political participation, treating people as if they were devoid of political attributes. Furthermore, judicial practices were marred by significant inequities, including a lack of judicial independence and fairness. Social stratification, widespread bribery, and corruption often allowed nobles and the wealthy to evade punishment, while the poor and marginalized faced harsher penalties. Defendants frequently lacked the opportunity to defend themselves, witness testimonies were often ignored or distorted, and torture was commonly employed during interrogations. Additionally, religious interference contributed to judicial injustices. In summary, medieval personal rights were fragmented, unequal, and essentially hierarchical, representing a developing form of personal rights.

From these constitutional documents, it is evident that although the most notable change in medieval constitutions was the limitation of royal power and the safeguarding of some basic rights of the people—achieving the principle of "the king under the law"—their core remained the preservation of royal and divine authority. For instance, Article 1 of the Magna Carta stipulates that the king must protect the rights and privileges of the Church, ensuring its position and power in social and political affairs, thus upholding divine authority. Article 35 grants the king the right to levy and collect reasonable taxes, ensuring that the king has sufficient financial resources to maintain the security and stability of the kingdom. Article 37 allows the king to restore confiscated lands and properties, safeguarding the king's property and territorial rights to ensure effective governance. Article 48 establishes the king's authority to maintain and restore the laws and order of the kingdom, endowing him with the power to uphold social stability and public order, thereby reinforcing his royal authority. These provisions represent limitations and balances on the king's power to prevent its misuse and infringement on the people's rights. However, they also ensure the king's power and privileges in political, financial, and legal domains. Thus, the Magna Carta can be seen as a mechanism for maintaining and balancing both divine and royal authority.

The bourgeois democratic revolutions that emerged with the Industrial Revolution broke the medieval divine rule and led to the liberation of human spirit and thought. In 1776, the Declaration of Independence in the United States articulated the principle that "we hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the pursuit of Happiness." This idea represents a core value in modern constitutions. In 1787, the United States adopted its first constitution, becoming the first country in the world to establish a written constitution.

Although no single event can entirely represent the emergence of modern constitutions, most scholars trace their origins to the late 18th century American Revolution and the French Revolution. It is evident that the constitutions of the 17th and 18th centuries represented a significant advancement compared to those of any previous era. The constitutions of this period emphasized principles such as individual liberty, checks and balances, and representative democracy.

Regarding individual liberty, these constitutions recognized inherent rights and freedoms, such as freedom of speech, freedom of religion, and property rights. They provided explicit provisions to protect these freedoms and restrict governmental interference and regulation. The principle of checks and balances emphasized that government power should not be concentrated in a single entity but rather distributed across different institutions and branches to prevent abuse and injustice. This system of separation included the executive, legislative, and judicial branches, which balance and oversee each other. In terms of representative democracy, it involved electing representatives to participate in decision-making and management of affairs. This form of democracy reflected public opinion and interests, with political power more decentralized and citizens' rights expanded compared to the medieval period. Core democratic principles, such as electoral systems, freedom of speech, and rule of law, became widely recognized and implemented. By granting people political participation rights, the democratic system enhanced the legitimacy of government. The government's authority is derived from the consent of the governed, and it must be accountable to the people. Citizens express their opinions and interests through electing representatives and participating in decision-making processes, which fosters greater government accountability and transparency, thus promoting the legitimacy and responsibility of the government. This reflects the development and transformation of social and political culture at the time.

Examining the evolution of constitutional development reveals that the core focus of constitutions has shifted according to different understandings of the protected subjects. This evolution reflects a reassessment of human value and a new understanding of the world. Early constitutions often lacked a clear protected subject due to social constraints and incomplete political concepts, with political power concentrated in the hands of a privileged few, leaving general people's rights insufficiently protected. In the medieval period, constitutions centered around royal and divine authority, with kings seen as divine representatives responsible for protecting the Church and faith. This perspective

reflected the religious beliefs and hierarchical structure of the time. However, with the Enlightenment and the rise of human rights ideals, modern constitutions shifted to protect civilian human rights. They emphasize individual dignity, freedom, and equality, placing people's rights at the core of the constitution. This transition indicates a reassessment of human value, recognizing that everyone should enjoy fundamental human rights and freedoms. The evolution of constitutional focus from divine and royal authority to civilian human rights mirrors societal progress and the development of human thought, acknowledging the universality of human rights and the pursuit of social justice. In summary, the changing core of constitutions reflects varying historical judgments on human value and rights, evolving from the protection of royal and divine authority to a focus on civilian human rights, thus providing a crucial legal foundation for achieving social justice and human rights protection.

## **2. The Influence of the Scientific Revolution on Constitutional Thought**

The Newtonian Revolution, led by the British scientist Isaac Newton from the late 17th to early 18th century, marked a profound shift in science. As noted by the renowned British science historian Dan Priel, Newton's greatest achievements were: (1) proving that terrestrial mechanics could be applied to celestial bodies, and (2) eliminating unnecessary philosophical prejudices from natural science. Prior to Newton, scientific inquiry was often constrained by philosophical views and biases rooted in religion, tradition, or personal beliefs, negatively impacting scientific progress. Newton introduced a scientific method based on observation and experimentation, emphasizing the validation of theories through empirical evidence. This approach discarded outdated philosophical biases, allowing science to focus more on empirical verification and thus producing more objective, accurate, and reliable conclusions. His mechanics not only explained earthly objects but also celestial motions, demonstrating a universal set of mechanical laws that applied equally to both terrestrial and celestial phenomena. This revelation challenged the medieval notion of celestial bodies as divine entities, leading to a shift in perspectives.

Specifically, the Newtonian Revolution fostered several critical transitions: from faith to reason, from transcendence to the temporal, and from mysticism to naturalism. Previously, religious belief played a major role in explaining natural phenomena and human existence. However, Newton's success shifted belief toward the idea that reliable knowledge about the natural world could be gained through reason and scientific methods. Newton's mechanics were grounded in observation, experimentation, and mathematical deduction rather than religious faith or mystical revelation, gradually replacing blind faith with rational inquiry as the foundation of modern science.

Furthermore, there was a transition from transcendental to worldly considerations. With the growth of scientific achievements in the 17th century, arguments based on design began to replace a priori theoretical bases, even occasionally superseding biblical revelation as a primary religious authority. This view did not reject the concept of God but emphasized the importance of the natural world.

Lastly, the shift from mysticism to naturalism marked a significant change. Previously, natural phenomena were often interpreted as supernatural forces or divine intervention. Newton replaced these mystical explanations with a rigid, mechanical concept of "force," articulated through scientific formulas and confirmed by empirical evidence. This naturalistic view posited that natural phenomena could be explained through scientific methods without resorting to supernatural explanations.

These shifts laid the intellectual groundwork for the 18th century, often referred to as the century of Voltaire. Enlightenment thinkers, led by Voltaire, emphasized reason as the measure of all things, championing concepts of freedom, equality, and democracy. They affirmed human value and dignity, opposing despotism with political freedom, religious oppression with freedom of belief, and Catholic authority with deism and atheism. The slogan of "natural rights" challenged the divine right of kings, linking the 18th century with terms like "Enlightenment," "reason," and "philosophy." However, a more accurate description of the era's spirit might be "humanism," which emerged as the result of

these three historical shifts. Humanism deeply influenced the constitutional thinking of the time, impacting the formulation and interpretation of laws across nations.

The most significant intellectual development of the Scientific Revolution was the rise of scientific rationalism, which profoundly influenced the evolution of modern societies and legal systems. Scientific rationalism is characterized by skepticism, empiricism, and secularism.

In its early stages, skepticism emerged as a challenge to religious and monarchical authorities, questioning faith and established power. In modern society, this skepticism gradually gave rise to a secular humanist legal framework. As time progressed, the spirit of skepticism derived from scientific rationalism contributed to the development of legal positivism. Legal positivism asserts that laws are subject to change and are not immutable like natural law, which endows the legal system with a dynamic nature capable of adapting to the evolving challenges of modern society. This adaptability is reflected in the continuous improvement and expansion of legal systems across different countries.

The principle of legal positivism manifests in the ongoing reform and enhancement of legal frameworks, where new laws are created to address emerging issues, ensuring that each case is handled in accordance with established legal norms. This iterative process of legal adaptation aims to achieve substantive fairness by aligning laws with the changing circumstances and complexities of contemporary life. As a result, the growing body of laws ensures that every case is governed by relevant legal provisions, providing a foundation for legal predictability and justice.

### **3. The Legacy of Scientific Rationalism in Modern Legal Systems**

The legacy of scientific rationalism profoundly shapes modern legal systems, marking a departure from static, divine-based laws to a more dynamic and adaptable framework. Scientific rationalism, emerging from the Enlightenment and Newtonian Revolution, introduced principles of skepticism, empiricism, and secularism, which have influenced legal theory and practice.

Firstly, skepticism, as a core element of scientific rationalism, challenges established authorities and dogmas. This skeptical approach has fostered a legal environment where laws are scrutinized and re-evaluated continuously, ensuring they reflect contemporary values and needs. It encourages a legal system that is open to reform and improvement, rather than adhering rigidly to outdated norms.

Empiricism, another pillar of scientific rationalism, emphasizes evidence-based reasoning. In legal systems, this translates to a reliance on empirical evidence and facts in judicial decision-making. The emphasis on observable and verifiable evidence helps ensure that legal judgments are grounded in reality, enhancing fairness and accuracy in the administration of justice.

Secularism, the third key aspect of scientific rationalism, has led to the separation of religious and legal domains. Modern legal systems are increasingly secular, meaning that laws are formulated and enforced based on rational principles rather than religious doctrines. This separation supports the development of laws that are inclusive and neutral, respecting the diversity of beliefs within a pluralistic society.

These elements of scientific rationalism underpin the concept of legal positivism, which posits that laws are human-made and can be changed to meet societal needs. Unlike natural law, which views laws as immutable and derived from a higher moral order, legal positivism acknowledges that laws must evolve to address new challenges and realities. This perspective has led to the continuous adaptation and reform of legal systems, ensuring they remain relevant and effective in the face of changing societal conditions.

In practice, this legacy is evident in the progressive reforms seen across various legal systems. Modern constitutions and legal frameworks are designed to be flexible, incorporating mechanisms for amendment and revision. This adaptability allows legal systems to address emerging issues, such as human rights, environmental concerns, and technological advancements, reflecting the dynamic nature of contemporary society. In summary, The legacy of scientific rationalism in modern legal

systems is marked by a commitment to skepticism, empirical evidence, and secularism. These principles have fostered the development of legal positivism, which supports the adaptability and reform of laws. As a result, modern legal systems are better equipped to respond to evolving societal needs and challenges, reflecting the ongoing influence of scientific rationalism on the pursuit of justice and fairness.

#### 4. Conclusion

In conclusion, the Scientific Revolution marked a profound shift in intellectual thought, introducing scientific rationalism as a dominant paradigm. This transformation had far-reaching implications, not only advancing our understanding of the natural world but also reshaping societal structures, particularly in the realm of law. The principles of skepticism, empiricism, and secularism embedded in scientific rationalism fostered the development of legal positivism, which emphasizes the adaptability and dynamism of legal systems. Unlike the immutable natural law, legal positivism recognizes that laws must evolve to address contemporary issues and societal changes. This evolution is reflected in the continuous refinement and expansion of legal frameworks, ensuring that laws remain relevant and effective in achieving justice. Ultimately, the legacy of the Scientific Revolution is evident in the modern legal systems that strive to balance tradition with progress, adapting to the complexities of the modern world while upholding principles of fairness and rule of law.

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