Part III

Interdisciplinary Integration of Public Law and Social Sciences: Problems and Solutions

Vladimir O. Lobovikov
Institute of Philosophy and Law,
Ural Branch of the Russian Academy of Sciences,
Ekaterinburg, Russia
E-mail: vlobovikov@mail.ru
ORCID: 0000-0001-8760-0452
SPIN: 3994-4289

The Natural State – A Filter on the Bivalent Boolean Algebra of Natural Law

(On the Unsatisfactory State of Affairs in the "Theory" of Natural Law over the Last Few Centuries on This Planet)

Abstract. The study focuses on natural law as a system of *formally defined* laws, specifically examining the *algebraic aspect* of this system. Its goal is to complement the well-known "theory" of natural law with the lesser-known theory of the *natural state*. In the precise definition of the natural state, animals of the species "*Homo sapiens*" are not mentioned at all (they are only a *specific case*), and the natural state appears as an *abstract, idealized concept* within natural law theory, which is *necessarily subjected to mathematization*. Methodologically, the study relies on *mathematical modeling*. The novelty of this research lies in the fact that it adds a precisely defined concept of the *natural state* to the *bivalent algebraic* system (of *formally defined laws*) of *formal axiology* within natural law. The natural state serves as a *filter applied to the bivalent Boolean algebra of natural law*. In this context, the terms "algebraic system", "algebra", and "filter" (specifically, ultrafilter) are used in their *formal, mathematical (algebraic) sense*, rather than in a metaphorical or vague manner.

This article deals with current theoretical issues in *public law*. Unlike private law, *public law is state law*. It addresses many specific issues that represent responses to contemporary challenges. However, public law also includes *fundamental theoretical* issues studied within the "science of the state" (*Staatswissenschaft*). One of these issues is the subject of this article. In legal positivism, the necessary connection between the concepts of "state" and "law" is complemented by the necessary connection of these concepts in legal naturalism. The mutual supplementation of positivism and naturalism (their symmetry) within the general philosophy of law requires the introduction of a "strange", unconventional concept – the "natural state" – and the strict formal definition of its content in strictly formally defined terms of *a discrete mathematical model* of natural law, namely, *a bivalent algebra* of natural law.

Rebelling against a thousand-year tradition, the founder of modern physics, Galileo Galilei, was firmly convinced that *the book of nature is written in the language of mathematics*. The surprising truth of Galileo's heuristically significant thesis, which scandalized the cultured people of his time, helps explain a fact that may seem curious to the modern educated person: that for centuries, from Aristotle to Galileo, all "physicists" were pure humanists ("poets") who explored nature on a metaphysical level, using only natural language to compose *poetic works* often titled "On Nature". It was Galileo, fluent in the special language in which the "Book of Nature" is written, who laid the foundations of modern physics (and natural science as a whole) as a science in the true sense of the word. In my opinion, there is a *similar* situation around *natural law*: paraphrasing Galileo, one could say that the strictly formally defined, universally necessary and immutable laws of natural law – the Laws of Nature – are precisely formulated in the special language of mathematics. Therefore, lawyers, the overwhelming majority of whom do not know this special language and have no desire to learn it, cannot (and are unwilling to) read or understand the Book of the Law of Nature.

However, in fairness, it should be noted that not all well-known philosophers and professional lawyers had minimal mathematical expertise or underestimated the role of mathematics in the progressive development of human culture – be it philosophical, moral-legal, artistic-aesthetic, religious-metaphysical, or culture as a whole. An obvious exception from this rule was the *lawyer* and academic G.W. Leibniz – a genius of mathematical and logical creativity. He approached mathematics, logic, and the philosophy of law, particularly natural law, with creativity, striving to achieve the highest possible advancements of his time. His works include, for instance, the unfinished "Elements of Natural Law" (Leibniz 1971), a work that remains untranslated from Latin into Russian to this day. Other prominent philosophers of the so-called golden age of natural law, such as Hobbes, Locke, and Montesquieu, also demonstrated a serious interest in and respect for both mathematics and natural law theory (see: Hobbes 1936; Locke 1988; Montesquieu 1999). Historians and legal theorists rightly consider this era (17th and 18th centuries) important for the development of legal naturalism (see: d'Entreves 1951; Finnis 1980; Finnis 1991; Pokrovsky 1998: 62). This period was crucial for the progressive development of the natural law doctrine. Unfortunately, although this era was favorable for natural law theory, mathematics had not yet matured into the realization of itself as a universal *theory of abstract mathematical structures*, and concepts like set theory, Boolean algebra, and universal algebra were yet to be discovered. This limited mathematical development explains why attempts to create *discrete mathematical models of natural law* either were not undertaken or were unsuccessful.

An extremely unsatisfactory state of affairs in both the study and teaching of the "theory" of natural law has persisted on this planet for millennia, from Antiquity to the present day. By the 20th century, mathematics had matured enough to serve as an adequate language and method for the theory of natural law, but legal positivism continued to dominate the philosophy of law. The lack of alignment between the development of the mathematical and legal subsystems of human culture grew more pronounced, eventually resembling an almost insurmountable divide.

In the early 20th century, Oswald Spengler paid particular attention to this significant deficiency in the development

of the culture of *Homo sapiens*, becoming the first to show the connections between the main corresponding stages of the historical development of humanity's distinct legal and mathematical cultures (Spengler 1928: 67, 82). He wrote: "The affinity between mathematical and legal thought is very close" (Spengler 1928: 67). In his opinion, it would take humanity about a hundred years, or at least the entire twentieth century, to overcome the obvious discrepancy (a significant gap, a chasm) between these *objectively interconnected cultures* (Spengler 1928: 83). However, Spengler's predictions proved overly optimistic: his ideas were either misunderstood or understood but ignored, and eventually forgotten.

Thus, unfortunately, over the past centuries, "legal" (philosophical-legal) discussions on natural law have turned into murky streams of purely humanitarian consciousness and are conducted in exclusively natural language: the debaters do not seek to express themselves clearly or to clarify for their interlocutors the precise meanings of the words and phrases used, making actual mutual understanding and agreement, as well as actual mutual understanding and disagreement, highly unlikely.

In the professional language of Roman jurists, the phrase "natural law" did not have the meaning it has been given in recent centuries: the "reception" of Roman law was accompanied by its peculiar interpretation, explanation, and editing, in particular, "trimming the excess" with the Occam's razor. This gradual *qualitative change in the meaning* of the term "natural law" was duly noted by Rousseau (Rousseau 1998; Rousseau 1994: 330), but jurists, especially philosophers of his time, ignored this remark: they gradually began to use the phrase "natural law" not in the medieval (antique) sense but in a fundamentally different one (Kareev 1902: 7-8). Unlike such renowned Roman jurists as Ulpian and Paul (see: Peretersky 1984: 23-25), in classical German philosophy (and parallel in national philosophies of law in other civilized countries), the subjects of natural law were declared to be only *rational beings*, that is, God and animals of the species *Homo sapiens*. Not only bacteria but all other living beings (even highly intelligent animals such as dolphins and chimpanzees) were denied natural legal subjectivity due to their lack of "reason". Not too long ago (in the Middle Ages), not only were bulls and pigs *accused of killing humans* and often sentenced to

the most severe *punishment (the death penalty)*, but even caterpillars were considered subjects of natural law and had rights to be *defendants, represented by attorneys, convicted*, and even *excommunicated* (Kantorovich 2012).

From time to time, there has been a renewed interest in the doctrine of natural law in the history of legal philosophy. Although most professional jurists of the past two centuries were convinced that this meaningless *metaphysical chimera* was absolutely dead, some lawyers called for its revival and reanimation (Stammler 1907; Stammler 1908; Hessen 1902; Novgorodtsev 1902; Novgorodtsev 1904a; Novgorodtsev 1904b; Pokrovsky 1909; Pokrovsky 1998: 60-76; Petrazhitsky 1913; Trubetskoy 1907; Kistyakovsky 1998), while others had principled objections to such revival (Kareev 1902; Kovalevsky 1902).

However, at the turn of the 19th and 20th centuries, under the strong influence of Kantian philosophy of morality and law, supporters of the so-called revived natural law had in mind its "trimmed" version – a "*kingdom of reason*" described in *purely natural* language. They were convinced that lawyers equipped with modern scientific theory could no longer be held responsible for the nonsense spoken by their Roman colleague Ulpian about natural law as necessarily universal and immutable, a law of nature uniting all people not only with all animals but with all forms of life (Kareev 1902: 2, 15; Kovalevsky 1902: 33, 62-63).

In fairness, it should be noted that in the 19th century, a doctrine based on *scientific knowledge of biology* – the theory of "mutual aid among animals" – stood in direct contradiction to the aforementioned critical (and demonstrably dismissive) attitude toward Ulpian's natural law concept, characteristic of modern times (Kropotkin 1904: 3-50). Prince P. Kropotkin, who developed an anarchist theory of state and law, argued that animals have a sense of justice; he claimed that in "the animal world, society has been found at all stages of evolution" (Kropotkin 1904: 39). His ideas, shocking to the average 19th-century jurist, closely aligned with what Ulpian once wrote about natural law (which should be common to humans and animals, uniting all living things). Critically re-evaluating and correcting the extremes of Darwinism, the rebellious prince insisted that "sociality is as much a law of nature as mutual struggle" (Kropotkin 1904: 6); mutual aid, he argued,

is "a law of nature and the main factor of evolution" (Kropotkin 1904: 7). In my opinion, Kropotkin's original, dissident reflections on "animal communities", on the "social life of animals" based on "mutual aid for the benefit of all members of the community" (Kropotkin 1904: 6), can be considered important historical precursors to the formation of an *abstract, idealized theoretical construct* that may be called a "natural state" and is necessarily connected with the *theoretically defined concept* of "natural law" (*within the algebra of actions*).

The presence in nature not only of struggle but also of "solidarity" and social alliances among living beings, specifically "animal societies" or "societies of animals", was also discussed by M.M. Kovalevsky, with a reference to A. Comte (Kovalevsky 1902: 34, 45-48). Kovalevsky was critical of the concept of "revived natural law" (Kovalevsky 1902: 33, 62-63). In his analysis of Comte's sociological ideas, he even discussed the latter's assertion regarding the existence of "peculiar societies characteristic of lower organisms" (Kovalevsky 1902: 47).

The intellectual movement that became known as "revived natural law" in the early 20th century ultimately led nowhere – essentially, it was much ado about nothing. No coherent theory of natural law emerged from it, neither as an abstract theory nor as one that aimed for any kind of universality. P.I. Novgorodtsev acknowledged this disappointing fact with the following statement: "If we take those names and works that are often cited in connection with the revival of natural law, it turns out that in the major theoretical works of our time, the problem of natural law was not only undeveloped but rather dismissed and replaced by other issues" (Novgorodtsev 1913: 18).

Why did a *genuinely* scientific theory of natural law – a *precisely formulated system of immutable and necessarily universal, formally defined laws* – fail to emerge at the turn of the 19th and 20th centuries? And was there ever, in principle, any real possibility of its emergence within the limits of that historically constrained intellectual movement? In my opinion, there was no such possibility: the "dead" or long "dormant" doctrine of natural law could not be revived or restored by the efforts of Stammler, Hessen, Novgorodtsev, Pokrovsky, Petrazhitsky, Kistyakovsky, and company; their desperate attempt was doomed to fail. Undoubtedly, such

a critical view requires justification. Let us consider the following arguments.

According to the philosophy of science, a theory is a logically organized system of laws – that is, *necessary* and *general* statements about its objects; a theory must systematically ignore random details and specific cases, concentrating instead on its objects in the broadest, most general terms. A theory does not directly relate to material objects of the real world; rather, it directly pertains to its *abstract, idealized objects*; if such objects do not yet exist, then neither does a theory. Novgorodtsev and the other scholars mentioned above were largely unaware of this.

According to the theory of positive law, a necessary attribute of a true legal law is its strict *formal definiteness*. Legal positivism justifiably emphasizes the strict *formal definiteness* of positive law norms, in contrast to the "laws of natural law" referenced (and formulated in an exceedingly ambiguous natural philosophical language) throughout centuries of political and legal thought. Regarding the vaguely formulated "theory" of natural law expressed in purely natural language over many previous centuries, S.S. Alekseev rightly notes: "…the categories of natural law… lack the qualities of strict definiteness – the decisive and unique merit of legal regulation" (Alekseev 2010: 337).

However, in my opinion, the scope of truth of this quite justified remark has both historical and logical boundaries, beyond which it is no longer valid. In the third quarter of the 20th century, the situation changed significantly: in the early 1970s, a *bivalent algebra of actions and agents* (individual or collective – it doesn't matter) emerged. For the first time in history, the doctrine of natural law was precisely formulated in a *clear, artificial language*; the concept of "natural law" was given a strict (explicit and precise) formal definition within the *algebraic system of natural law as formal axiology*. From this historical moment onward, the critique of a lack (or insufficiency) of strict formal definiteness in the laws of natural law is no longer relevant (Lobovikov 2022: 81). Unfortunately, however, the vast majority of contemporary legal scholars are unaware of this. This circumstance highlights the importance of creating, progressively developing, and effectively applying a *fundamentally new* (modern) theory of natural law as formal axiology – a necessarily mathematized theory whose universal laws

are characterized by formal definiteness and immutability (to a far greater degree than those of positive law) despite the obvious empirical facts of the variability and relativity of evaluative judgments (Lobovikov 2022: 81). These evident facts of variability and relativity in evaluations do not contradict the eternal (immutable), necessarily universal, *formally defined* laws of the bivalent Boolean algebra of natural law.

The novelty of this research lies not in discussing the *strict formal definition* of laws within the *Boolean algebra of natural law*, which is quite unconventional for legal positivists, but in proposing the concept of "natural state" as an essential step for advancing the modern, mathematically-oriented theory of natural law. In my opinion, this psychologically unexpected (and potentially shocking for standard legal positivists) theoretical concept should somehow be integrated into the existing *discrete mathematical model of natural law* – namely, the algebra of formal axiology (Lobovikov 2002; Lobovikov 2022). This does not concern the empirical search, discovery, or sensory perception of the natural state (an *abstract, idealized object* of theory) in the material world, but rather the invention (intentional abstract-theoretical construction) of a *particular algebraic structure* closely related to the already existing algebraic system of natural law as formal axiology.

In both academic and educational literature on the theory of state and law, the view that *law and the state are necessarily interconnected* is, if not universally accepted, then at least clearly dominant. There are no fundamental disagreements on this point between respected theorists of state and law in the West (Kelsen 2007) and in the East (Alekseev 2015): virtually all respectable professional jurists in civilized countries recognize that the *state is the source and guarantor of the implementation of law*. However, this refers to positive law, created exclusively by people specifically authorized by the positive state, which itself is an *organization artificially created by people alone*. The term "natural law" is used by almost all legal theorists, whether frequently or rarely, explicitly or implicitly (see, e.g.: Alekseev 2015; Kelsen 2007). In contrast, the term "natural state" is either entirely absent or appears very rarely, revealing a clear asymmetry. To address this asymmetry, we need to acknowledge that there are systems in nature that can be called "*natural states*" – *sources of natural law, suitable forms for*

its existence, and effective means for its implementation. This unusual (psychologically unexpected for legal positivists) thesis was first presented over 20 years ago at the conference "The Logic of Tolerance and Law" (Yekaterinburg, December 24–25, 2001) and was subsequently published in the conference proceedings (Lobovikov 2002). Unfortunately, there was no response, although, in my opinion, this rather non-trivial philosophical and legal thesis deserves discussion among specialists in the philosophy of law, as it touches on significant aspects of the general theory of law and state.

Now, it is appropriate to move from substantive philosophical and legal discussions presented in the vague and ambiguous natural language to precise definitions of the natural-law concepts under discussion, using the completely unambiguous artificial language of mathematics. If we define *a natural state as a filter within a bivalent Boolean algebra of actions (or acts) and agents*, then what exactly does "filter on a Boolean algebra" mean? The following quote provides an answer to this question:

"*A filter on a Boolean algebra M* is a non-empty subset $D \subseteq M$ that satisfies the following conditions:

(1) $x, y \in D \Rightarrow (x \cap y) \in D$,
(2) $x \in D, x \leqslant y \Rightarrow y \in D$,
(3) $x \in D \Rightarrow (-x) \notin D$.

A filter D on a Boolean algebra M is called an *ultrafilter* if it satisfies the following condition:

(4) $x \in D$ or $(-x) \in D$ for any $x \in M$.

A filter D on a Boolean algebra M is called *simple* if it satisfies the condition: for any $x, y \in M$.

(5) $(x \cup y) \in D \Rightarrow x \in D$ or $y \in D$.

A filter D on a Boolean algebra M is called *maximal* if it is not contained in any other filter on M" (Lavrov, Maksimova 1975: 22). Precise definitions of the concept of a "filter on Boolean algebra" can also be found in the works of P.M. Kon, D.A. Vladimirov, and A.I. Maltsev (Kon 1968: 212; Vladimirov 1969: 39; Maltsev 1970: 193).

In my opinion, a crucial concept for those using mathematical modeling methods in rational philosophical and legal discussions

about the "City of God" (Aurelius Augustinus 1998) and the notion of a "natural state", which is necessary for modern theory of natural law, is "***Theorem 2.7:*** *Every filter of a Boolean algebra is contained in an ultrafilter*" (Kon 1968: 212).

To facilitate the understanding of the above, let us consider the following graphical model. Let the symbol M represent the set of either good or bad actions (acts) and actors (agents), depicted by the gray quadrilateral below, on which the *bivalent Boolean algebra of natural law is based*. The symbol T denotes a subset of set M (represented by a circle within the quadrilateral) that is confined to a specific time (epoch), space (territory), and the people living in that time and place, effectively controlling that territory in the given time period.
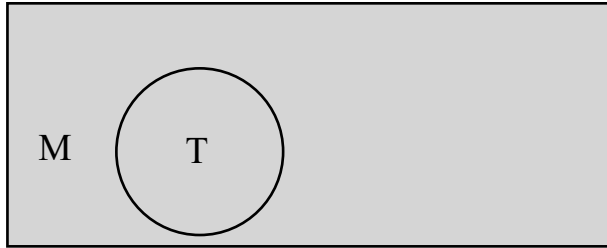

Fig. 1. *Positive* state T, defined on the set of actors and acts

Figure 1 presents the *positive* state T, defined by territory, history, and people: this refers to a definition that does not use evaluative categories of natural law, such as "good" and "just". In other words, Figure 1 graphically models the *positivist* definition of the state T, which steers clear of the concepts of good and evil.

Is it possible to visualize (represent through a graphical model) the precise formal definition of the abstract concept of "*natural* state" given above? In my opinion, it is. Let us consider the *natural* state in territory T. If all good (actions or individuals) are marked in white, and bad in black, the subset of T in the gray circle, belonging to the set M (modeled by the gray quadrilateral), would look as follows:
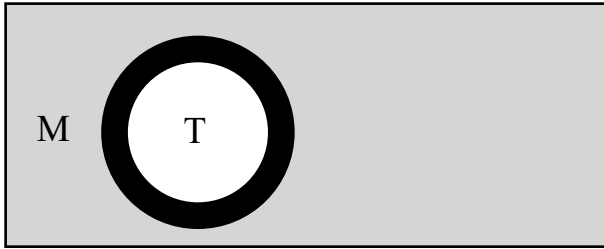
Fig. 2. The *natural* state T as a filter on the bivalent Boolean algebra
of natural law

The white circle inside the quadrilateral models the *natural state* T. In full accordance with the precise formal definition of the abstract concept of "natural state" provided above, this (white) circle represents a set whose elements are all and *only* good acts and actors belonging to the set T. There are no black elements in the natural state T; they have been "filtered out" and are exclusively concentrated in the subset of T that is highlighted in black.

The mathematically precise *natural law* definition of the concept of "state" does not contradict the existing positive legal definition; instead, they complement each other, creating a harmonious conceptual synthesis. For example, the presumption of innocence – a key element of positivist legal technique – fits perfectly with the notion that, in a natural state, only good acts and actors exist, while bad ones are "filtered out" elsewhere. Similarly, in a positive state, all actors are considered innocent according to this presumption. However, if an actor is found guilty by a court, he/she is subsequently "filtered out" by the state to another place.

It is clear that the concept of the "*natural state*" discussed in this article – defined as "*a filter on the Boolean algebra of actions and agents (subjects)*" – is not inherently connected to concepts such as "reason", "rational beings", "natural intelligence", "human", "God", and so on. While such a connection is *possible*, it is *incidental* and represents only a specific case. Therefore, when discussing the natural state in its most general sense, we should set aside these associations. From this perspective, *agents or actors (the subjects of actions) can be any living beings*, in line with the ancient

Roman natural law theory of Ulpian and Paulus (see: Peretersky 1984: 23-25). In this case, the natural state can be understood as a harmonious community – a "*commonwealth*" *or symbiosis* – of living systems that engage in mutually beneficial *cooperation (mutual aid)* and *solidarity* aimed at the common wealth. Within this framework, the "City of God" (Aurelius Augustinus 1998) represents an important example of this universally abstract system of bivalent formal axiology. It functions as the *maximal* filter in the bivalent Boolean algebra of acts and actors (whether individual or collective – this distinction is irrelevant).

References

Alekseev S.S. 2010. *Collected works. In 10 vols. [+ Reference. vol.]. Vol. 6. Ascent to Law: Searches and Solutions*, Moscow, Statute, 558 p. (in Russ.).

Alekseev S.S. 2015. *State and Law*, Moscow, Prospekt, 152 p. (in Russ.).

Aurelius Augustinus. 1998. *Creations by the Blessed Augustine in Four Volumes. V. 3. The City of God. Books I-XIII*, St. Petersburg, Aleteyya, Kiev, UTsIMM-press, 595 p. (in Russ.).

Cohn P.M. 1968. *Universal Algebra*, Moscow, Mir, 352 p. (in Russ.).

d'Entreves A.P. 1951. *Natural Law: An Historical Survey*, New York, Macmillan Co, 658 p.

Finnis J.M. (ed.) 1991. *Natural Law (a collection of papers)*, Oxford, Clarendon Press, 843 p.

Finnis J.M. 1980. *Natural Law and Natural Rights*, Oxford, Clarendon Press, 425 p.

Hessen V.M. 1902. *Revival of Natural Law*, St. Petersburg, Tipografiya E. Evdokimova, 43 p. (in Russ.).

Hobbes T. 1936. *Leviathan, or Matter, Form, and Power of a Commonwealth Ecclesiastical and Civil*, Moscow, Sotsekgiz, 503 p. (in Russ.).

Kantorovich Ya.A. 2012. *Trials against Animals in the Middle Ages*, Moscow, KRASAND, 64 p. (in Russ.).

Kareev N.N. 1902. Is It Worth Reviving the Natural Law? *Russkoe Bogatstvo*, no. 4, pp. 1–15. (in Russ.).

Kelsen H. 2007. *General Theory of Law and State*, Clark, NJ, The Law-Book Exchange, Ltd., 516 p.

Kistyakovsky B.A. 1998. *Philosophy and Sociology of Law*, St. Petersburg, Izdatel'stvo Russkogo Hristianskogo Gumanitarnogo Instituta, 800 p. (in Russ.).

Kovalevsky M.M. 1902. Sociology and Comparative History of Law, *Vestnik Vospitaniya*, no. 2, pp. 31–63. (in Russ.).

Kropotkin P. 1904. *Mutual Aid among Animals and Humans*, St. Petersburg, Izdanie Tovarishchestva M.D. Orekhova i KO, 211 p. (in Russ.).

Lavrov I.A., Maksimova L.L. 1975. *Tasks for Studying Theory of Sets, Mathematical Logic, and Theory of Algorithms*, Moscow, Nauka, 240 p. (in Russ.).

Leibniz G.W. 1971. Elements of the Natural Law, *G.W. Leibniz. Philosophishe Schriften. Erster Band (1663–1672)*, Berlin, Akademie-Verlag, pp. 431–485. (in Latin).

Lobovikov V.O. 2002. A Discrete Mathematical Model of the Natural Law and State: from Logic of Rigorism to Logic of Tolerance, *Logika Tolerantnosti iPprava : materialy nauch. konf. (Yekaterinburg, 24–25 dek. 2001 g.)*, Yekaterinburg, The Ural State Univ. Press, pp. 159–187. (in Russ.).

Lobovikov V.O. 2022. Natural Legal Law as Mathematics of Freedom (Four Mathematically Different Moral-Legal-Value-Functions "Freedom" and Four Ones "Slavery" Defined Precisely in Two-Valued Algebra of Formal Axiology of Ethics and Jurisprudence), *Antinomies*, 2022, vol. 22, iss. 1, pp. 65–90, doi 10.17506/26867206_2022_22_1_65

Locke J. 1988. *Essays in Three Volumes. Vol. 3*, Moscow, Mysl', 668 p. (in Russ.).

Maltsev A.I. 1970. *Algebraic systems*, Moscow, Nauka, 392 p. (in Russ.).

Montesquieu C.L. de. 1999. *The Spirit of the Laws*, Moscow, Mysl', 672 p. (in Russ.).

Novgorodtsev P.I. 1902. Moral Idealism in Philosophy of Law. (Towards Revival of Natural Law), *Problemy Idealizma*, Moscow, Moskovskoe psihologicheskoe obshchestvo, pp. 236–296. (in Russ.).

Novgorodtsev P.I. 1904a. State and Law, *Voprosy Filosofii i Psikhologii*, no. 74, pp. 397–450. (in Russ.).

Novgorodtsev P.I. 1904b. State and Law, *Voprosy Filosofii i Psikhologii*, no. 75, pp. 508–538. (in Russ.).

Novgorodtsev P.I. 1913. Current Position of the Problem of Natural Law, *Yuridicheskiy Vestnik*, no. 1, pp. 18–24. (in Russ.).

Peretersky I.S. 1984. *Justinian Digesta. Selected Fragments with Notes*, Moscow, Nauka, 458 p. (in Russ.).

Petrazhitsky L.I. 1913. To the Problem of Social Ideal and Revival of the Natural Law, *Yuridicheskiy Vestnik*, no. 2, pp. 5–59. (in Russ.).

Pokrovsky I.A. 1909. *Natural-Law Trends in History of Civil Law*, St. Petersburg, Tipografiya B.M. Volfa, 53 p. (in Russ.).

Pokrovsky I.A. 1998. *Fundamental Problems of Civil Law*, Moscow, Statute, 353 p. (in Russ.).

Rousseau J.-J. 1994. A Discourse on a Subject Proposed by the Academy of Dijon: What is the Origin of Inequality among Men, and is It Authorized by Natural Law? *A. Mortimer (ed.). Great Books of the*

Western World, Chicago ; Auckland ; London ; Madrid : Encyclopedia Britannica, Inc. Vol. 35: Montesquieu; Rousseau, pp. 323–366.

Rousseau J.-J. 1998. *Of the Social Contract. Treatises,* Moscow, KANON-press : Kuchkovo pole, 416 p. (in Russ.).

Spengler O. 1928. *The Decline of the West (in two volumes). Vol. 2. Perspectives of the World History*, New York, Alfred A. Knopf. Inc., 408 p.

Stammler R. 1907. *Economy and Law from the Viewpoint of Materialistic Understanding History. Vol. 1*, St. Petersburg, Nachalo, 408 p. (in Russ.).

Stammler R. 1908. *Essence and Tasks of Law and of Jurisprudence*, Moscow, Tipografiya Tovorishchestva I.D. Sytina, 326 p. (in Russ.).

Trubeckoy E.N. 1907. *Encyclopedia of Law,* Moscow, Izdanie Studentov, 224 p. (in Russ.).

Vladimirov D.A. 1969. *Boolean Algebras*, Moscow, Nauka, 318 p. (in Russ.).