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## University 4.0: What Type of Thinking is Coming? (Part I)

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**Abstract.** The study is framed by the concepts of 1) “university – cognitive institute” and 2) “generations of university”. Within different generations, the types of thinking (mindsets) that were generated and used in universities are considered (in pre-industrial society – scholastic, in industrial society – research, in post-industrial society – entrepreneurial). To characterize the mindset, a methodological scheme “object – manner – intention” is used:

Thinking at the University 1.0: object – Divine order, its metaphysical foundations; manner – positing mental entities, constructing reasoning; intention – understanding authoritative texts and creating a consistent doctrine (a common field of meanings).

Thinking in University 2.0: object – Nature (objects, processes, laws); manner – building models, creating ideal objects, mental experimentation, hypothesizing; intention – creating theories (ontologies of nature), setting tasks for observations and experiments, creating foundations for production technologies and projects (industrial civilization).

Thinking in University 3.0: object – Activity (subjects, actions, technologies, environments, opportunities); manner – analyzing possibilities based on multi-subject models, planning of innovations; focusing on entrepreneurial schemes that configure the participants, creating the basis for new social and production practices.

Thinking in University 4.0: object – The world of thinking and practices (subjects, principles, norms, foundations and boundaries of various thoughts and practices); manner – methodological reflection, positing and transforming the foundations of thoughts and practices; focusing on projects and technologies for collective and hybrid intelligences (cognitive civilization), new ways and means of thinking, social relations and institutions, new socio-anthropological experience.

The hypothesis that university of the future (cognitive civilization) will cultivate methodological thinking (“thinking about thinking”), and that its target will be in generating collective and hybrid (with AI participation) intelligence, as well as in developing compliant technologies for their work is substantiated. It will generate a new agenda for the society and create plans and precedents for new practices.

Part I of the article presents the basic research concepts and characteristics of the types of thinking that were generated and reproduced by first-generation universities.

**Keywords:** Future University, generations of university, University 4.0, cognitive institution, methodological thinking, cognitive civilization.

Research area: Theory and History of Culture and Art (Cultural Studies).

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## Университет 4.0: какое мышление будет культивироваться в будущем? (Часть I)

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**Аннотация.** Теоретической базой исследования являются концепты 1) «университет – когнитивный институт» и 2) «поколение университетов». Рассмотрены особенности типов мышления, которые рождались и воспроизводились в университетах разных поколений (университет в доиндустриальном обществе – схоластический, индустриальном – исследовательский, постиндустриальном – предпринимательский). Для характеристики типов мышления используется методологическая схема: «предмет–способ – направленность (интенция) мышления».

Мышление в Университете 1.0: предметность – Божественный порядок, его метафизические основания; способ – полагание мысленных сущностей, построение рассуждений; направленность – понимание авторитетных текстов и создание непротиворечивого учения (общего поля смыслов).

Мышление в Университете 2.0: предметность – Природа (объекты, процессы, законы); способ – построение моделей, создание идеальных объектов, мысленное экспериментирование, выдвижение гипотез; направленность – создание теорий (онтологии природы), постановка задач для наблюдений и экспериментов, создание оснований для производственных технологий и конструкций (базиса индустриальной цивилизации).

Мышление в Университете 3.0: предметность – Мир деятельности (субъекты, активности, технологии, среды, возможности); способ – анализ возможностей на основе полипредметных моделей, замысливание инноваций; направленность – создание предпринимательских схем, конфигурирующих деятельность участников инновации, создание оснований для новых социально-производственных практик.

Мышление в Университете 4.0: предметность – Мир мышления и практик (субъекты, принципы, нормы, основания и границы различных мышлений и практик); способ – методологическая рефлексия, полагание и преобразование оснований мышлений и практик; направленность – создание конструкций и технологий работы коллективных и гибридных интеллектов (базиса когнитивной цивилизации), новых способов и средств мышления, социальных отношений и институтов, новых социально-антропологических практик.

Обосновывается гипотеза: университет будущего (когнитивной цивилизации) будет культивировать методологическое мышление («мышление о мышлении»), его ключевой

задачей будет формирование коллективных и гибридных (с участием AI) интеллектов, разработка технологий их работы. Он будет обеспечивать генерацию новой повестки для общества, создание замыслов и прецедентов новых практик.

Часть I статьи представляет базовые концепты исследования и характеристики типов мышления, которые порожились и воспроизводились университетами первого и второго поколений.

**Ключевые слова:** университет будущего, поколения университетов, университет 4.0, когнитивный институт, методологическое мышление, когнитивная цивилизация.

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## Introduction

University development may pursue different targets and frames. On the one hand, there may be upgrades made to solve current issues or to implement the practices of leading higher education institutions; on the other – certain steps towards the *University of the Future*, which is yet to emerge following wave-like changes in technology and social life. This will call for dramatically innovative shifts in higher schools' system or for a new intellectual institution (*greenfield project*). A new *development assignment* is needed to catch up with such sweeping changes in human activities, society, and mankind type – it will enable universities to be effective in social transformation by integrating new forms of thinking, activity, and social relations.

This article is another part of (Efimov, 2014; 2016; 2017; 2020) – an attempt to describe a future university as one of the key entities in the social system.

J. Le Goff (1993), and P. Yu. Uvarov (2000) understand university as an institutional form of intellectual activity, a result of intellectual men's self-management. Universities as institutionalized “communities of thinkers” (from the Middle Ages to the Modern Times) were capable of intellectual work and training for new generations of professionals (“thinking possessors”). Thus, university means a “body” in the society and culture that creates, devel-

ops, and transmits complex forms of thinking and activity<sup>1</sup>.

As a public institution, university settles into a branched population<sup>2</sup>, in which not all members operate as “pioneers”, i.e. expand, or create new areas of reality mastered by thinking. Many of them are more focused on such specific tasks as training, and thus, are likely to fail the “idea of the University.” As to K. Jaspers (2021) this idea reveals in creating living spaces lightened by thinking activities through rationality and concepts (creative thinking that transforms a person). In this work, the main goal is not a diversity of universities; it is important for us to focus on representing the university as an institution of thinking.

To conceive the future of universities, it is necessary to grasp the history of both social changes and the changes in universities, as well. As a rule, such “vector”<sup>3</sup> is a result of

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<sup>1</sup> The fact that a university not only transfers, but also generates new types/forms/systems of thought is a non-obvious and risk statement. It can be justified by historical-genetic analysis (which was done, in part, in the works of Le Goff (1993) and Uvarov (2000)) and the study of turning points in the development of thinking and universities.

<sup>2</sup> The term “populous object” was suggested by G.P. Schedrovitsky (2005b)

<sup>3</sup> The very presence of such “vector” is a hypothesis. An alternative is possible, in which historical changes are chaotic (or multidirectional in the areas of different civilizations), and progress is relative. Such hypotheses are verified not by facts, but by the entire set of development practices of universities and other institutions, for which they set value and ontological guidelines.

identifying trends or drivers (technological, economic, sociocultural, etc.) that involve universities. Another approach means suggesting several “generations” in the universities’ history, while the future of universities is a birth of another generation (Nikitin, 1991; Wissema, 2009; Shchedrovitsky, 2015). In this term, a generation describes an ideal model, i.e. integrity, coherence of characteristics grounded in a certain way.

Following the idea, there is an original version of university generations (Efimov, 2016; 2017). Their nature is linked to the characteristics of technologies and activities, social structures, and cultural identities in each historical stage. This concept lacks the idea of what types of thinking were cultivated and developed by universities of different generations, and what new type of thinking will be deployed in universities of the next generation (University 4.0), so the article answers this question.

This is a review on an intellectual development within the history of European civilization (from an eidetic cognition to discursive, objective, and further, systemic, and methodological thinking), that links historical types of thinking to universities of different generations. A hypothesis on what type of thinking University 4.0 should form is discussed. This will help to set the “goal” for universities to become a competent institution of thinking.

## 1. Four Generations of Universities

**University 1.0 (scholastic).** Universities 1.0 emerged in the medieval Europe as networks of intellectuals who needed a communication environment, a community – for thinking and knowledge acquisition, for transferring knowledge and methodologies to students. Thus, University was an institutionalized form of intellectual work, a “social body” of thinking. In these times, the phenomenon of profession (vocation) arose – a cleric, lawyer, doctor, diplomat, teacher. Universities trained new professionals through lectures, academic debates, libraries, composing and defending academic theses (Le Goff, 1993; Uvarov, 2000).

**University 2.0 (research).** Universities 2.0 are the result of the industrial revolution, the birth of science and engineering, deter-

mined by the need to educate the national elites, researchers, and engineers. In University 2.0, students, on the one hand, goes through the training “assembling line” of educational programs; on the other – they are involved scientific schools’ life and work in laboratories.

**University 3.0 (entrepreneurial).** Universities 3.0 emerge as the post-industrial comes – they are the platforms for innovative, project-based work. This generation form an entrepreneurial competence and skills through team-and-network project activities. The Universities aims creating grounds<sup>4</sup> for new practices (humanitarian and cultural practices, in particular).

**University 4.0 (cognitive).** This generation results from the digital revolution, intellectual work massification, and changes in management systems (corporate, state, and public) towards a “collective mind.” Students receive education by participating in “thinking machines” creation, developing virtual realities and grounds for new practices (Table 1, Fig. 1).

## 2. A short excursus to the mindsets’ genesis

A University is treated as an institution of thinking in two senses: 1) it contributes to new mindsets forming; 2) it means a “social body” that spreads new mindsets among the society. We echo the cultural-historical view of thinking, in which orientation, content and forms of thinking travel a complex evolution accompanying the development of civilization and culture. Such historical approach emerged in philosophy (from G. Vico (1984), A.R. Turgot (1999), J.A. Condorcet (1955) to G. Hegel (2000), who discussed the “progress of human mind” (Shchedrovitsky, 2005a), history and methodology of science (Lakatos, 2008; Shchedrovitsky, 2005a; Rozin, 1989; Rozin, 2008); in cultural anthropology and cultural history (Lévy-Bruhl, 2012; Foucault, 2001; Gurevich, 1984); in psychology (Piaget, 1970; Vygotsky, 1983: 25–30; Luria, 1974; Cole, 1998, etc.).

At the same time, in terms of activity theory (A.N. Leontiev, D.B. Elkonin) and activity approach (G.P. Shchedrovitsky, M.V. Rozin), thinking is a part of a complex system – col-

<sup>4</sup> University’s status as operating at the foundation level is discussed in (Efimov, 2020).

Table 1. Generations of University: activities, mindset, society, and human

		Generations of University			
Units	University 1.0 (pre-industrial society)	University 2.0 (industrial society)	University 3.0 (post-industrial society)	University 4.0 (cognitive society)	
Target activity	Individual mastering; activity relies on patterns, traditions; it creates goods (on the top – significant works/masterpieces)	Standardized, technological action. Studying natural systems (natural science) – observation, experiment, modeling; science for machine engineering and technologies	Project development; designing and implementing entrepreneurial schemes; creating foundations for projects (research in activity paradigm)	Developing principles for new practices (concepts, ontologies, values); technologization and instrumentalization of thinking, creation of collective and hybrid intelligences; virtual realities as “trial bodies” for invoking large-scale changes; developing methods and technologies for maintaining collective and personal “created worlds” (Genisaretsky, 1995).	
Type of thinking	Metaphysical thinking – reflecting the sources and principles of the things existent	Rational, natural scientific thinking – operating by “objects” and “processes”	Multi-subject – uses “objects”, “processes”, “subjects”, “activities”; forms new branches (politics, management, social design, etc.)	Methodological – reflection towards its ontology, objectivity, and tools; consciously operates with values, ontologies, and principles of practice	
Social dimension	Intellectual community: brotherhoods, fellowship of intellectual people, hierarchy in scholastic degrees	Social “machine”, in which relations and interaction are regulated and formalized (“Intellectual brotherhood” remains in the form of unofficial university communities)	A combination of vertical and horizontal relationships, administration and “team” work; flexible regulation and personalization in interactions. The University is organized through “competence centers”, “environments”, “resources” and “users”; included in research and educational networks, in technological ecosystems	“Intellectual meta-community”; University becomes integrated with the society, creating and maintaining intelligent networks and environments. Main type of internal and external interaction – positional conflicts and cooperation synergy	
Idea of a human as the target for education	A divine object, likeness of God, master (in philosophy, rhetoric, polemics); values and beliefs are perfectness in actions, continuity of traditions, “eternity” through works	A researcher (on the frontier of scientific world picture) and, at the same time, a teacher – performs a part within the “assembling line” of training system. His values and attitudes: rationality, individualism, pragmatism, instrumentality, technological effectiveness	A leader, entrepreneur, organizer, and meta-expert; values and targets are innovative approach, open-mindedness, social skills, willingness to learn new activities, to handle challenges and cases.	Person in search activity, “boundaries games”; intentions – implementation of “created worlds”; values and beliefs – creativity, independence, cognitive and volitional concentration, individuality, trust, synergy, integrity	

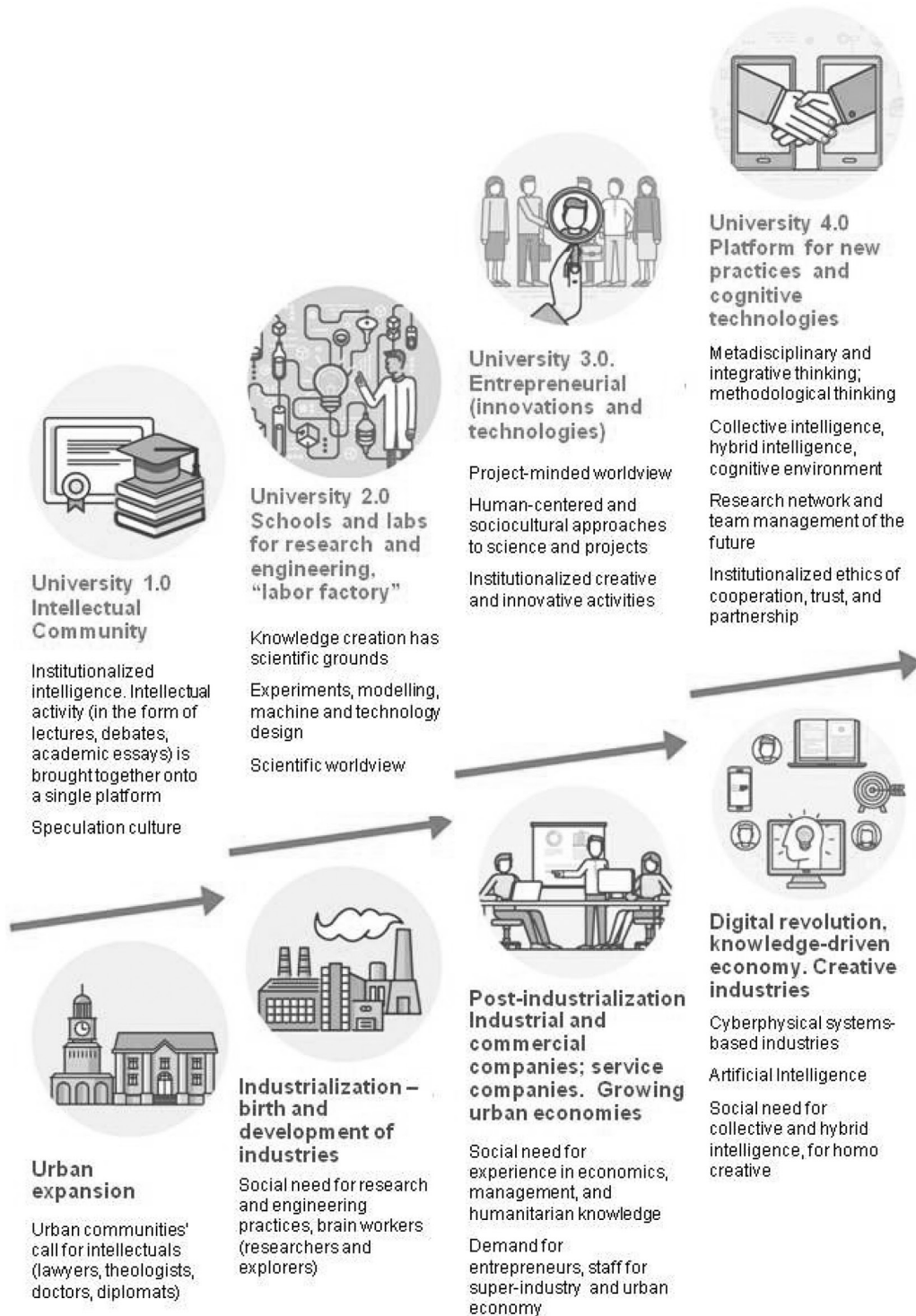


Fig. 1. Generations of University and social development

lective activity, which requires: 1) human interaction, 2) use of symbolic means that replace material objects and can organize activities.

An example is a proposed by V.M. Rozin (1993) pseudogenetic reconstruction of geometry appearance – its ideal objects and operating system. The sign organization of the activity *scope* identifies and structures the *subject* in it. Since the signs (with the abstract, non-active content captured) turn into the functional subject, and, further, there are interactions of the signs (abstract contents) – a “thinking at Large” rises. Pure thinking suggests idealization – bringing the links captured by signs to an extreme, “refined” form – and ideal objects designing. Through these objects, it develops an ideal reality (theory) of mathematics, philosophy, law, physics, etc. Theoretical knowledge can be tried on the “real world” through special procedures (by reflexing the experience, or through experiment, construction, and design), and constitutes various practices<sup>5</sup> (Rozin, 1989; 2008).

The history of thinking can be seen through its objectified forms – texts, artifacts, and events. Stepping aside the possibilities and limitations of reconstructing bygone mindsets, let’s note that the European history distinguishes such socio-cultural stages as Antiquity, the Middle Ages, Modernity (Modern Times) and Post-Modernity. Considering the production capabilities and socio-economic systems, the last two are also called the Industrial and Post-industrial eras.

Currently, many (philosophical, psychological, “science about science”, interdisciplinary, etc.) “research programs” (in the sense of I. Lakatos (2008)) for the mindsets’ history rebuilding have been suggested, but only par-

<sup>5</sup> The concept of practice is devalued by its use as a synonym for effective performance. Dating back to the Ancient philosophy, practice meant using of any doctrine, system of ideas, or theory. “Praxis” is an activity of a free person, that is, the freedom to express one’s beliefs and ideas about the beauty. The main result is testing of ideas and practitioner’s self-development. The Young Hegelians and Marxists used the concept of “revolutionary practice,” which meant the transformation of reality. Thus, practice is a system that includes foundations (idea, views, doctrine, theory, etc. and super-tasks formulated on their basis) and the “implementation” of these foundations into activity – adequate goals, tasks, methods, tools, products.

tially implemented. Things are better with the history of ideas created as there is a good heritage in the history of sciences (mathematics, physics, biology, linguistics, etc.). Still, with few exceptions (Akhutin, 1976; Stepin, 2003), the mind that created all these objects remains out of analysis.

Thus, only few episodes have been articulated through hypotheses, which make it possible to see its framework. Philosophical, cultural studies or science about science, can give just a sketchy idea of what the thinking in different periods of European history consisted of.

Thinking has come a long way in its history from practical intelligence to theoretical one, building systems of concepts, mental objects, and models. This is the path from ensuring the “smartness” in certain activities to the cognitive reconstruction of the whole world in its scopes and complexity.

As the history shows, methodological thinking emerges and targets thinking as its research subject. It reflexively operates with the types of thinking, constructively uses the ideas and models born by different grounds. Methodological thinking can identify and present the very paradigm<sup>6</sup> of thinking as an object – explicit and implicit speculations, categories, concepts, and rules that outline what is possible or impossible, acceptable or unacceptable for a given thinking. Expectedly, the “breakthroughs” and overcoming existing paradigms are not spontaneous, but rather projected.

In the 20<sup>th</sup> century, computer technology made it possible to teach the machines the operational part of thinking – calculations, or operations with signs. Recent years have witnessed Generative Pre-trained Transformers (GPTs) that can generate user-determined text and images. A task has been set to create a universal artificial intelligence capable of understanding and solving any-type-problems, and of communicating with new meanings generation. Being technologized and machine-enhanced, thinking will give a birth to a new round of civilization development, just as agriculture or metallurgy gave rise to the past civilizations.

<sup>6</sup> A paradigm and a “scientific revolution” as a change in the paradigm of thinking was introduced by T. Kuhn (1970).

Historical type of thinking are characterized by: 1) initial ontological questions, i.e. a problematic area; 2) new objects and ways of thinking that determine the very space of mental activity and the type of results obtained; 3) vector (intention) of thought, firstly, on “packaging” of all kinds of contents into certain categorical, eidetic and conceptual schemes, i.e. creating a coherent picture of the world; secondly, to justify and equip transformative actions – new socio-productive and socio-anthropological practices.

Each mindset has its own horizon, and what is beyond and cannot be thought, is concerned illogical, absurd, and “nonsense”<sup>7</sup>. In historical transitions, the capabilities of thinking are aimed at overcoming the existing and opening a new horizon of thinking by forming new ontological issues; setting new subjects and ways of thinking; anticipating of different practices.

Thus, there are cultural-historical types of thinking that can be discovered when studying the peaks of civilization development within historical periods. These types are the framework for thinking in certain fields of activity (religion, science, engineering, etc.) or science (if they existed). They can be characterized through their subjects, methods, and vectors.

**The object of thinking** is universal definitions of *what* is thought in certain era. The ultimate form of objectivity is *what basically* can exist and can be thought; it forms ontology, the ontological basis of the mindset<sup>8</sup>.

**The manner of thinking** is a set of forms and means that thinking uses to create various contents (for example, modelling, principles, and laws formulating). Extreme forms

<sup>7</sup> For example, in the Medieval thinking, “nature”, which arose independently of God, is an absurdity; an arbitrary creation of the universe “out of nothing” is something that cannot happen in the natural scientific thinking of the New Age. Operating with infinitesimal quantities was impossible before differential formulas; a chaotic motion of particles was indescribable to thought before the statistical physics appeared.

<sup>8</sup> “Everything is a game of elements”, “everything is a rational creation and can be understood through the idea of creation (and there is nothing but what is created)”, “everything is things and processes and can be understood as the interaction of things (and there is nothing but things and processes)”, “everything is acting subjects with their realities”.

of conceivability are categories and categorial schemes<sup>9</sup>.

**The intention of thinking** are tasks solved by thinking peculiar to a certain period: 1) “social-cognitive” means creation of ontologically and logically coherent ideas, in the peak – a holistic picture of the world; 2) social and practical ones create new activity, or technological, social, and production opportunities.

### 3. Mindsets in Universities of different generations

The proposed overview on the stages of thinking development is based on F. Kh. Kessidi (2003), S.S. Averintsev (1975; 1989; 2010), A. Ya. Gurevich (1984), P.P. Gaidenko (1996), V.S. Stepin (2003), V.S. Bibler (1975), A. V. Akhutin (1976), V.M. Rozin (1989; 2008), T. Kuhn (1970), I. Lakatos (2008) and other Russian and foreign philosophers and cultural scientists.

#### **Background: Classical thinking**

Thinking as a special activity with its own tasks and results occurred long before the universities. In European civilization, a move from eidetic and syncretic thinking to a discursive and objective one was in the days of Antiquity. In this time, the basic (classical) reflection (*what is discussed*) gave a way to *noemas* (i.e. units of conceivable content). Unlike the mythological consciousness, for which “everything can be everything,”<sup>10</sup> the objective consciousness accepts *something* that remains itself; *ideas* (i.e. eidos – basic relationships, which are perceived figuratively) are formalized.

In some areas, this work has reached the level of ideal objects, i.e. the units of theoretical thought:

1. Ideal objects are the result of semiotic objects’ transformation into operative objects; they mean a special “reality” with its own laws and content (e.g. ideal objects in geometry (Rozin, 1993)).

2. Ideal objects reflect ontological construction (the “elements” that form every-

<sup>9</sup> To sample: space – time and casualness in traditional science.

<sup>10</sup> Kessidi (2003).



thing, or “atoms and emptiness” in ancient metaphysics).

The Ancient mindset views the world through measures and forms, values and their relationships, figures, and their conversion. It builds statics (equilibrium configurations of bodies) and regards movement as a time-and-distance traveled ratio. At the same time, eidetic thinking (intuition of mental objects and relationships) evolves into a discursive one, suggesting reasoning and proof. To some extent, reasoning-centered reflection made it possible to “separate” grammar from logic, to establish the rules for logical analysis and argumentation<sup>11</sup>. There also were first attempt to transform knowledge into a logical system (Euclidean geometry).

Reasoning itself was formed out the discussion and “integrated” in texts – essays and letters<sup>12</sup>. Thinking began to exist as a special reality “above” individual mental acts. “Sign bodies” of ancient thinking are oral and written statements, and drawings.

The intention of thought was to create a sound integrality, revealed through temples, poleis, or a harmonious person (i.e. kalokagathia which means combinations of physical, intellectual, and moral perfection).

Next, we will outline the nature of generations of universities through the characteristics of thinking forms peculiar to each era. First, there is a “draft”, an empirical picture of what thinking looked like in different periods of history; the results are pushed through the methodological scheme “object – manner – intention”.

### 3.1. University 1.0

In the Medieval Europe, advanced thinking was a thing of scholastics (Averintsev, 2010), who were engaged in teaching, philosophy, and specific areas of knowledge. The scholastic scientists discussed the Church Fathers’<sup>13</sup> essays and translated fragments of Plato and Aristotle. In the 12<sup>th</sup> century, Aristotle’s

<sup>11</sup> In Aristotle’s essays – Analytics, Topics, etc.

<sup>12</sup> To sample: the letters of Archimedes to his friend Dositheus, in which Archimedes explains the relationships he discovered in the field that we today call statics (a branch of physics).

<sup>13</sup> Outstanding church leaders who were distinguished by orthodoxy of teaching, holiness of life, remarkable scholarship

*Categories* and *On Interpretation* became also available. The early scholastics “looked at Aristotle’s views through a tiny window”, that was a ground for problems and contradictions which were explained in Aristotle’s system, but in other (unknown) works. Scholastics’ thinking turned out to be focused on trying to put together fragments, resolve contradictions and, moreover, “match” the ancient philosophers with the Church Fathers.

Inevitably, metaphysical questions<sup>14</sup> arose, and scholastics tried to find the answers in various texts, including those that – in current terms – lied at the intersection of logic and linguistics. Scholasticism focuses on definitions, carefully found authoritative quotations, compilation of comprehensive reviews, discussion of similarities and differences in texts, and formally deductive reasoning. At the same time, book-learning was highly valued, while the real experience was not. Knowledge acquisition was available either through divine revelation – the Bible, – or the “natural ability of the mind”, i.e. the logical operations over existing definitions and judgments.

In the 13<sup>th</sup> century, almost all of Aristotle’s works became available, and scholasticism flourished, preserving its key features – formal rationality and book-learning; “summas” – extensive essays that included the whole written data for a certain area – were created (“Summa Theologica”, “Summa Musica”, etc.). The Middle Ages used a mix of thinking techniques, combining speculations on entities and logical inference with metaphors and analogies<sup>15</sup>. The schemes are hierarchy<sup>16</sup>, opposition<sup>17</sup>, genus-species, etc.

In certain areas (mathematics, mechanics) models and operating systems were developed (as compared to the Ancient Times); thus, im-

(Ambrose of Milan, Gregory the Theologian, Saint Augustine, St. Jerome, etc.).

<sup>14</sup> Issues of first principles.

<sup>15</sup> For example, the human body parts were compared to the elements that form the universe (flesh resembled earth, blood – water, breath – air, heat – fire). Allegorical comparisons served as a means of classifying things and events and relating them to eternity (Gurevich, 1984, 63–65).

<sup>16</sup> Heavenly hierarchy of spiritual entities, earthly hierarchy of classes, occupations, living beings, etc.

<sup>17</sup> Good and evil, righteous and sinners, spiritual and fleshy, pure and dirty, terrible and funny, etc.

plementing Arabic numerals radically improved the understanding and use of numbers; representing the ratio of variables as a value made it possible to model the movement, etc.

The intention of thinking was to comprehend the world as a divine order; to coordinate the human life and activity with this order (righteous life and redemption); to achieve success in different activities (household, family, craft, healing, etc.) through matching the actions with the principles identified by thought or given by tradition.

During this period, the most important thing was to *establish* the objects of thinking, opposed to a sensually determined reality and human activity; to maintain this space of thought without “falling” into a profane consciousness. The symbols and attributes of the university, debate and statement ethics, professors’ appearance – all this and many others have served as a means of collective “keeping oneself within thought” (in speculative reality).

Established in the 13<sup>th</sup> century, universities became centers and carriers of scholastic knowledge and ways of thinking. Students had to master the methods and techniques of brain work, e.g. defining terms, constructing judgments and conclusions. They had to listen to lectures delivered by professors and read scien-

tific treatises (to understand how scientists argue), participate in debates (develop their own thoughts) and, in the end, write and defend an academic thesis.

• **Object:** The world as a divine order; men and society<sup>18</sup> are seen in the context of divine creation and eschatological perspective; speculative essences are metaphysical foundations of the sensually determined world (matter, form, act, potency, goal, absolute, etc.).

• **Manner:** speculation on “entities”, holding the domain of thought, opposed to the one of experience and activity; thought articulated in speech (argumentation); search for matches and analogies between the intelligible and the experienced.

• **Intention:** 1) “extracting” thoughts (entities and their system) from an authoritative text; linking texts into a coherent mega-text (doctrine); formulating morals; 2) rationalizing practical actions. This work determined<sup>19</sup> the principles of European civilization (Christianity).

<sup>18</sup> In the Medieval thought, semantic dominants are time (of a person’s life), social relations (visible through the prism of “love for one’s neighbor”), labor, wealth and property, law, social status and vocation of a person, personality (persona) (Gurevich, 1984).

<sup>19</sup> Together with the church, monastic orders, diplomats, etc.

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