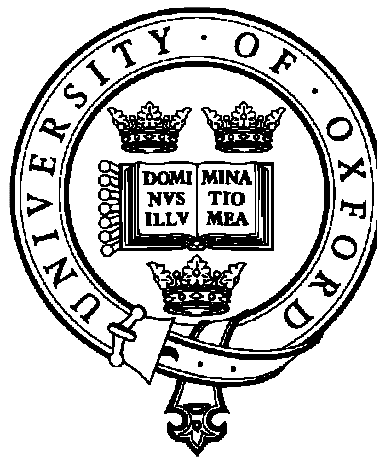


Mathematical Foundation in Pavel Florensky's Philosophical Worldview



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Abstract

In this thesis I conduct a comparative study between two works of Pavel Florensky – *Mnimosti in Geometry* and *Iconostasis*. While the former is a mathematical text on analytic geometry and the latter is a theological book on religious aesthetic in art and philosophy, we find a number of grand uniting factors between the two, including duality, perspective and a dividing plane.

I show that both works are manifestations of Florensky's focus on integrality, intended to paint a picture of a holistic world. He uses mathematics and art to describe the *mnimoie*¹ space, its relation to the real space, and the greater whole they both constitute.

¹ A commonly-encountered translation is "imaginary," though we will later go in depth about translating this term and intentionally leave it in the original Russian here.

Statement of Originality

The material presented in this thesis is my own work and, to the best of my knowledge, does not contain material previously published or presented formally, unless due reference is made in the text. No part of this thesis has been submitted for another degree or to another Institution.

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Introduction

1. Pavel Aleksandrovich Florensky: Background
 - 1.1 Upbringing
 - 1.2 Influences
 - 1.2.1 Mathematical Context
 - 1.2.2 Philosophical Context
 - 1.2.3 Political Context

2. *Mnimosti in Geometry*
 - 2.1 Problems of Current (1920's) Mathematics
 - 2.3 Measuring the Area of a Triangle
 - 2.3 The *Mnimoie* Space
 - 2.4 The Complex Space as a Holistic space

3. *Iconostasis*
 - 3.1 Critique of Western Art
 - 3.2 Duality
 - 3.3 Integral Vision

4. Comparative Argument
 - 4.1 Uniting Motivations
 - 4.2 Uniting concepts
 - 4.2.1 Perspective
 - 4.2.2 A dividing flat surface
 - 4.2.3 Duality
 - 4.3 Terminology

Conclusion

Introduction

Cited repeatedly as Russia's Leonardo da Vinci, Pavel Florensky has gained much attention from scholars and religious thinkers, particularly in the last two decades. He was first given that title by V. Filistinsky, who wrote an article about Florensky in the Pskov paper *Za Rodinu*² during the German occupation of the city (Lossky 176). Most recently, the reference appeared again in the title of the first biography on Florensky published in English by April Pyman. This reference to the prototypical "Renaissance man" is not surprising, given all the faces and influences Pavel Florensky had in his lifetime: a mathematician by training, he wrote serious papers in analytic geometry and number theory, as well as published the first Russian paper on Cantor's set theory; a theologian and ordained priest, he published a number of Orthodox Christian works that continue to influence academic and practicing Christian theology; a philosopher, he was openly committed to a holistic unison of mathematics, natural sciences, art history, linguistics, and religion; finally, a scientist in chemistry and material science, Florensky made great contributions to the development of various engineering advancements in the 1920s and 1930s in the USSR.

As Demidov and Ford point out in the conclusion of their chapter on Florensky, however, the title "da Vinci" can also be misleading. Florensky's primary drive behind all of his intellectual and spiritual endeavours did not lie in the simple "strive for knowledge." His goal was clear: to use all means possible in order to construct a unified world, where science and religion, phenomena and noumena, the spiritual and the rational exist in complement and in concord (Demidov and Ford 611).

Taking this strive for unified theory as a given, and based on the writings of numerous authors³ and Florensky himself, I accept concepts of holism, duality, and perspective to be global aims and ideas fundamental to Florensky's world view. I acknowledge also the fact that Florensky viewed the fields of mathematics and art to be the superior tools for understanding the universe. The aim of this text is to conduct a comparative study of the way Florensky's overarching ideas are manifested in two texts of very different nature published in the same year (1922): *Mnimosti in Geometry* on analytic geometry and *Iconostasis* on the art of icon-painting.

A note on translations: unless indicated otherwise, quotes from texts originally in Russian are translated by the author of this thesis. Where appropriate, the original wording is presented in Russian in the footnote. Where paraphrased, however, the original is not presented, but the referenced page number is given.

² "For Homeland"

³ I refer in particular to works of Pyman, Antonova, Demidov & Ford, Graham & Kantor, and Zdravkovska et al. See Bibliography.

Chapter 1

Pavel Aleksandrovich Florensky: Background

Section 1.1

Upbringing

Pavel Florensky was born on the 9th of January, 1882 in Yevlakh, present-day Azerbaijan. From a non-religious family of democratic intelligencia, half-Russian and half-Armenian, with a “faith in science as panacea for society,”⁴ it is perhaps surprising that his persona was and continues to be of great importance to the thought and practice of Russian Orthodox Christianity. At the age of seventeen he claimed to have undergone “mystical experiences,” most of which took place during sleep or on the verge of waking, and from which he was certain of the existence of God (Pyman 14).

Florensky went to school in Tiflis and wrote about the way the natural surroundings of the Caucasus affected him. His father, a railway constructor engineer who worked on the trans-Caucasian railroad, was not a religious man, but undoubtedly asserted the value of mathematics and science into the young Pavel. Even after his revelational religious experience described above, he still decided to study mathematics at university, though the purpose of applying mathematics was quite distinct to that of his father. Pavel Florensky wrote of having “necessity of a solid mathematical foundation for constructing a world view for a philosophical and theological understanding of the world” (Demidov and Ford 598). Thus, from a very early age, Florensky saw mathematics, philosophy, and theology as inherently connected, with mathematics as the foundational ‘glue.’

Section 1.2

Influences

A man able and interested in many fields, Pavel Florensky was likewise influenced by diverse people. Primarily, however, he gained inspiration from people much like himself – those who, beyond their primary field, sought connections with other observable phenomena or theoretical ideas.

The earliest thinker that Florensky writes about is Plato, whose conceptions of essences as pure, complete, eternal, and good were of no doubt influential: inherent goodness and completeness are central notions to Florensky’s philosophy. Kozin remarks that for Florensky, “the divine is everything; it is therefore plain. And, once it appears, it appears wholly” (Kozin 306). I note here the connection between holism and simplicity, which gives us motivation for the comparative study: while mathematics and religious philosophy may not be easy to understand, there must, for Florensky, exist some essence in the universe to unite the two, and the structure of this connection – again, not necessarily salient – must not be disgracefully complex. Pyman says that he was “under the spell of Plato” along with his friends at the Moscow Theological Academy, embarking on a proof for ‘justification of God’ that is later found in *Pillar and the Ground of Truth*, entirely unaffected by the tradition of scepticism prevailing in Russia at the time (Pyman 71).

⁴ Quote taken from Florensky’s school diary, found in Demidov and Ford (597).

Section 1.2.1

Mathematical Context

With his intuitive drive toward uniting mathematics and philosophy, Florensky found himself in an encouraging environment in Moscow State University, where he was admitted to the Physico-Mathematical Faculty. While the mathematical and philosophical schools of thought in St Petersburg were focused on positivism at the time, Moscow mathematical thinkers were at the height of questioning the developments of 19th century's mathematical analysis by addressing the ignorance towards problems of functional discontinuities and infinities. The Muscovites were driven by questions of application, mainly to philosophy and engineering, rather than questions of logical structure and inapplicable theory.

N.V. Bugaev, a philosopher and mathematician at Moscow University and a supervisor of Florensky's work, played a great role in the development of the young thinker. Traces of his influence are particularly evident in Florensky's focus on discontinuous functions as those we must not fear in order to achieve a cohesive worldview. The fact that Bugaev took both a mathematical and a philosophical approach on the matter encouraged Florensky to do the same in his work and in further pursuits. Together with another teacher D.F. Egorov and a friend N.N. Luzin, Florensky initiated the "Moscow School of Theory of Functions," which is known to have had immense influence in the development of 20th century analysis (Zdravkovska and Duren 40).

Besides discontinuities, Pavel Florensky was also intrigued by infinities. He was the first to publish an article in Russian on Cantor's work in cardinality – on infinite sets of different sizes – for the "Religious-Philosophical Society of Writers and Symbolists" at the turn of the century. In this article, he argued for the 'actuality' of infinity in the way that Cantor did, distinct from the 'potentiality' thereof, as many of his contemporaries (like Luzin) perceived (Graham and Kantor 90). Needless to say, this society was also a great support and influence in his objectives for unison of religion, mathematics, and philosophy. Moreover, the symbolists of this Society were among the many that discussed and promoted a religious revival in Russia, which I discuss in the next section.

Section 1.2.2

Philosophical Context

Besides mathematical studies at Moscow State, Florensky also attended lectures in the History and Philology Faculty by L.M. Lopatin as well as Trubetskoy's philosophy lectures, both of which had a profound impact in the history of Russian philosophy and in the general development of Russian intellectual thought. Upon entering the Moscow Theological Academy in 1904, there is no doubt that Pavel Florensky read the works of Gregory Palamas – the great teacher of Hesychasm within the Eastern Orthodox Church of the 14th century. Lossky et al write that Palamas's words defined God as light, experienced according to its energy. Moreover, they say "the divine light, for St Gregory Palamas, is a datum of mystical experience," which Florensky underwent during his "revelation" of God's existence (Lossky et al 58). The connection between light and God is also well-outlined in much of Florensky's work. As I will show in the next chapter, it is integral for understanding the nature of an icon. Lossky also wrote of the importance light had for Florensky, where the absence thereof was the defining feature of sin (Lossky 185). Hesychasm also promotes a

practice which connects the mind with the heart, allowing one to get closer to the light (and therefore to the Holy Spirit). This is an intricate process, in which one can be deceived and fall into *spiritual delusion* (Krausmüller 112). Florensky here is likewise worried about such a wrong that would result in self-centred ecstasy (Florensky *Iconostasis* 8)⁵.

A thinker considered foundational to Russian religious philosophy and influenced by the school of Slavophilic philosophy, Vladimir Soloviev (1853-1900) was a great influence for Pavel Florensky. There exists a myriad of works⁶ comparing the two thinkers; here I list only a few examples. First and foremost, Soloviev's writing on wholeness and *sobornost'* paved the tradition for much Russian philosophy. He wrote about the need for "the universal synthesis of science, philosophy, and religion" (Kostalevsky 5). The focus of philosophy, according to Soloviev, should be on integrality, or unity, of all things in the universe, no matter how opposing they seem. He published a work titled "The Crisis of Western Philosophy" in 1874, calling for unison between "the logical perfection of the Western form with the fullness of the spiritual contemplations of the East" (Kostalevsky 11). What is particularly relevant to Florensky, given that this study looks at his work on icon-painting, is Soloviev's claim that "true philosophy" – a term close to "integral knowledge" – must be inherently linked with moral action and with genuine creativity (Kostalevsky 112).

The integrality of the world is likewise undeniably important for Florensky. For him, Truth, Goodness, and Beauty constitute a metaphysical triad that are a unit – they are not different concepts (Lossky 182). "If Truth *is*," Florensky said, "it is real rationality and rational reality, the Infinite conceived as an integral Unity"⁷ (Lossky 180). For the purposes of our argument, the integrality of rationale and intuition is essential, since for Pavel Florensky the latter holds a connection to the divine: again in his own words: "only at moments of illumination by grace are ... contradictions reconciled in the mind, not rationally but in a superrational way" (Lossky 181). Note that, while promoting intuitivism, he still values the process of thought, since the reconciliation must take place in the *mind* (in addition to the soul or the heart). That is, for Florensky "the divine must be apprehended in a thinking way," yet one that is not limited to "the rationality of geometry or logic" (Kozin 305). There is much more to be said about the comparison of these thoughts to Soloviev's philosophy, but I leave this here.

I have mentioned several people seeking at that time to establish a "religious renewal" in Russia, and Soloviev was a principal actor among them (Ivanova 10). In Florensky's time and with his involvement, this "renewal" turned into a strong counter-movement to the rise of Bolshevism and its concurrent rejection of religion (Demidov and Ford 598). Needless to say, this movement did not play a role as grandiose as was intended due to the quick curbing of religion with the coming of Soviet power, but its initial plans and acceleration were substantial.

Symbolist poets Andrei Belyi (son of N.V.Bugaev), Aleksandr Blok, and Biacheslav Ivanov had a notable involvement and thus a connection to Florensky's thoughts (Ivanova 9). The following quote, from *For My Children* (1925), has been reproduced in nearly every large text on Florensky, and it shows his defining features as a symbolist, a phenomenologist, and a seeker of unitotality:

⁵ Note the continuity of terminology here, where both Gregory Palamas and Pavel Florensky utilise the term *prelest'*, having the closest translation as "spiritual delusion."

⁶ Examples include Deane-Drummond (83-85), Pymon (41-59), and Slesinski (467-471). See Bibliography for detail.

⁷ This shows the influence of Hegel, whose famous words "all that is real is rational; all that is rational is real" closely resemble Florensky's thoughts I discuss here (Hocking et al 66-69).

All my life I have thought, basically, about one thing: about the relationship of the phenomenon to the noumen, of its manifestation, its incarnation. It is the question of the symbol. And all my life I have pondered one single question, the question of *the symbol* (*For My Children* 153⁸)

Discovering and describing this relationship, which in itself is obviously linked to the search for “integrality,” was clearly a mission Florensky hoped to fulfil in his lifetime.

Section 1.2.3

Historical Context⁹

It is beyond the scope of this thesis to discuss the details of the political developments that coincided with Pavel Florensky’s lifetime, but the obvious must be mentioned. World War I, Bolshevism, Russian Civil War, and the formation and evolution of the Soviet State could not go unnoticed in his biography.

Before the October Revolution Florensky struggled with sustaining the “religious revival movement” without upsetting the state. In 1905 he was arrested after his sermon “Appeal of Blood” against executions of revolutionaries. In prison for only a week, he used the time to write a short work “On the elements of the alpha number system.” In 1913 there was an “open conflict” between the Church and the government over the active “Circle of Seekers of Christian Enlightenment,” in which Florensky played an active role. His co-founder M.A. Novosiolov was arrested in 1928 for his writings “Praisers of the Name” that this Circle published.

Ironically, the year after the October Revolution – after the Church gained the long-anticipated independence from the state – the Theological Academy was closed by the new state. It continued to function underground, though the leaders – Egorov and Losev – were both arrested in 1930 for this. In 1921 Florensky attempted working with N.A. Berdiaev in the “Free Academy of Spiritual Culture,” but the following year Berdiaev was expelled from the USSR.

As a result, beginning in the year 1921, experiencing a spiritual crisis as a result of religious oppression and continuous stumbling blocks in his endeavours, Florensky committed much of his time and efforts to scientific and technological research. Notable achievements include construction of an analog calculator, of high-voltage and long-distance energy transmissions, and of various carbolite products. Moreover, he held high posts, including the Assistant Director for Science at the All-Union Electro-Technical Institute (1930-1933). Though he published much of his work, after his arrest his name was removed from many papers and from many of his entries in the *Technical Encyclopaedia*, making his exact contributions difficult to trace (Demidov and Ford 607).

His inquisitive mind continued to work even after his arrest in 1933. In the ‘corrective labour camp’ of Skovorodino, Amurskaia *oblast’*, he spent most of his time researching the properties of permafrost, intending to contribute to the industrial development of the country by providing solutions to construction problems in areas with permafrost. Letters home reveal his utter misery in learning that his library collection had been taken away by the KGB in 1934, showing his inability to

⁸ Translation taken from (Pyman 9).

⁹ Information presented here has been gathered from Pyman, Demidov and Ford, and Zdravkovska et al.

separate himself from intellectual pursuits, even in the forests of Siberia. Named “enemy of the people” in 1937, he was shot on the 8th of December of the same year.

Chapter 2

Mnimosti in Geometry

Though published in 1922, Florensky wrote most of the text for *Mnimosti in Geometry* well before the date of publication. It is a work of analytic geometry, focused on the description of *mnimoie* space and its analytic and geometric relationship to the real space. The author inserts a number of applications of his ideas to various fields, including electrical engineering, visual art, and philosophy. His Chapter 9, which has previously been looked at the most by scholars, compares Florensky's outlined geometric descriptions to Dante's *Divine Comedy*. The original publication had a cover illustrating the geometric ideas presented in the book. It was carved out of wood by Vladimir Favorskiy, and Florensky spent a full Appendix (titled *Clarification to the Cover*) explicating the meaning of this cover.

Before continuing with a description of this text, I would like to discuss the use of the word *mnimost'* and other variations (the verb *mnit'*, the adjective *mnimyi*). As this word is relevant not only to geometry, and as its use in this text is not only in the form of *mnimyye chisla*, or imaginary numbers, one should not immediately infer that that is the meaning the author implies.

Slovar' Velikoruskago lazyka¹⁰ defines *mnimyi* as "*neistinnyi, voobrazhaemyi, vidimyi, i obmanchivyi*", among others, translating to "non-genuine, imaginary, discernible, and deceitful." The same dictionary defines the verb *mnit'* as "to think, to suggest," while the reflexive verb *mnit'sia* is defined as "to seem, to appear," though more accurately in Russian as "*kazat'sia, predstavliat'sia, mereschit'sia*." Another dictionary¹¹ defined *mnimyi* as "not existing in reality, imaginary," but also as "*prityvorny, lozhnyi*," or "pretending, fallacious."

I point this out because in literature the title of this text is most frequently translated as *Imaginary Numbers in Geometry*. However, the title is not *Mnimyye Chisla v Geometrii*, but rather is it just *Mnimosti v Geometrii*, suggesting that the typical translation erroneously narrows the scope and implication of this work. What he refers to is, broadly, "the imaginary" that could imply various descriptions, not only that of numbers. Moreover, the "imaginary" is more closely associated with the Russian *voobrazheniie*, which describes the process of creative thought more so than visions of another reality. To avoid making assumptions, I will not translate the word *mnimost'* and all its derivations (adjective, noun) and will use the Russian term throughout the text.

I now present a summary of the points in *Mnimosti in Geometry* central to the argument of the text as well as to this dissertation.

Section 2.1

Problems of current (1900s) mathematics

The discussion begins with a critique of current interpretation of complex functions as depicted on a complex surface, developed from theories of Quine, Wessel, Argand, Gauss, and

¹⁰ "The Dictionary of the Great Russian Language," originally compiled by Vladimir Dal' in 1881, this edition of Moscow: Russkii lazyk, 1981

¹¹ 1983 edition of Akademiia Nauk, Institut Russkogo lazyka (Academy of Sciences, Institute of Russian Language) of USSR, Moscow: Akademiia Nauk, 1983.

Cauchy. This interpretation, Florensky claims, takes into account solely the *content* of the function, while missing its holistic point (Florensky *Mnimosti in Geometry* 7). More precisely: since independent variables of complex functions require a full surface to be depicted geometrically, the dependent variables must then exist on a wholly separate surface. The geometrical connection between the two variables, thus, is broken, and while the two types of variables are analytically connected, the two surfaces are not immediately (and causally) related in geometric space.

Since geometry has played a useful role in depicting concepts from analysis, we must also look, Florensky suggests, for a way that analysis is able to enrich geometry. The approach utilised at the turn of the century Florensky finds disjointed: one is forced to use analysis to fill the holes of geometric reasoning, but those holes, even when filled analytically, lack a geometrical interpretation. The main object of this text, then, is the following: “to find a place in [geometric] space for *mnimyie* representations, without subtracting any existing representations from the real space”¹² (*Mnimosti in Geometry* 10).

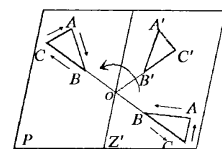
Section 2.2

Measuring the area of a triangle

The main methodological error of both Descartes and Cauchy, according to Pavel Florensky, is of assuming the incorrect fundamental unit of measurement. In studying a given surface, it is senseless to use a unit, like a point or a line, which is *neodnorodnyi*¹³ with the content of the given object. That is, in measuring a surface, one must use an infinitesimal portion of the surface as the basis for measurement (*Mnimosti in Geometry* 11-12).

Florensky views the following to be problematic: given a triangle, depicted on an x-y plane, with three points, each with a unique coordinate, we use the determinant (inputting those three coordinates) to obtain the value of the triangle’s surface. However, the sign of the area changes (from positive to negative) if the coordinates are entered in a clockwise order as opposed to a counter-clockwise order. We can think of this measurement as literally “walking around” – *obhod* – the triangle, thus able to obtain the area in two different ways (*Mnimosti in Geometry* 13).

In an attempt to provide a reason for obtaining different signs (positive and negative) for measurement of area depending on the order utilized in calculations of the determinant, Florensky shows that “flipping” a triangle over a given axis would result in another triangle with coordinates in reverse order. Philosophically, he claims, these two triangles are then no longer congruent, pointing out that such statements have been previously argued by other scholars¹⁴. See the visual depiction of this reversal, reproduced here from the text (*Mnimosti in Geometry* 17).



Чертеж 5-й

¹² “необходимо науги ничего не отнимая от уже занявших свои места образов действительных” (*Mnimosti in Geometry* 10)

¹³ Translating as “non-uniform” or “not homogeneous,” this term is used in both texts and will later serve as an important uniting factor for the comparison between the dividing plane of the icon and the geometric space (see Section 4.2.2).

¹⁴ He references René de Saussure in the text (*Mnimosti in Geometry* 17).

The solution Florensky finds is introducing another parameter into the determinant, which physically carries the interpretation of *motion*, presumably on the surface of the triangle in the process of measurement. Through mathematical deduction – arithmetic, geometric, and logical – Florensky shows that the determinant sign (and thus the area of the triangle) must remain positive with this method (*Mnimosti in Geometry* 15-16). This remedy also allows Florensky to claim that “walking around” the triangle in measuring area is in fact an *absolute* motion¹⁵; it may appear as clockwise or counter-clockwise, but this is just a result of looking at the plane from different sides.

Section 2.3

Mnimoie Space

Since flat surfaces are just a type of surface, the method by which one interprets a given representation on a surface should be applicable to all surfaces. For a concave surface, for example, it would be senseless to assume that measurement of the same figure on both sides will be equal (*Mnimosti in Geometry* 18). By that reasoning, Florensky claims, the different signs account for a difference in *perspective* – the side of the surface from which the measurement is being taken influences the sign of the resulting value.

He suggests that, in order to understand why walking around a figure in two different directions will influence the sign of the area, one must take a less anthropocentric notion of *perspective* by assuming the dominant perspective to be that of the figure in relation to an observer, rather than of the observer in relation to the figure. The result necessitates the entire surface to be negative on one side and positive on another. The walk around, then, will generate a positive area if one is walking counter-clockwise on the positive side or clockwise on the negative side, and similarly it will be negative if one is walking clockwise on the negative side or counter-clockwise on the positive side.

Having found this inherent *duality*¹⁶ responsible for our misguided representations, these two worlds of real and *mnimoie* space, Florensky says, must be separated by a flat transparent plane, one in which both real and *mnimyie* depictions exist at once. One side of this plane comprises the real space, while the reverse constitutes the *mnimoie* space, and the points and lines located on that side are thus also *mnimyie* in nature (*Mnimosti in Geometry* 25).

In Chapter 5, Florensky looks at the *mnimaia* side of a flat object lying on a plane. Namely, he considers the *mnimaia* surface of a square, knowing it to be of negative value (both from determinant calculations and from the reasoning that the *mnimaia* side of a plane is altogether negative). To achieve a negative area, both sides of the square must be *mnimyie* (containing *i*) for an obvious mathematical reason, and therefore, any part – segment, point – of these lines comprising the sides of the square must also be *mnimyie*.¹⁷ Here he makes an important distinction: what for him is a *mnimaia* point is not the common use of the term (*Mnimosti in Geometry* 26). Usually, he says, a *mnimaia* point will refer to a point with complex coordinates, (e.g. $5+6i$). Florensky titles such

¹⁵ “абсолютный обход” (*Mnimosti in Geometry* 18)

¹⁶ “двойственность” (*Mnimosti in Geometry* 14)

¹⁷ Any portion of a greater whole, according to Florensky, must be *odnorodnyi*, ” or “homogeneous,” “of the same nature.” This term is important for the comparison of the dividing planes between the two texts (see Section 4.2.2) and is the antonym to *neodnorodnyi* mentioned in the previous Section.

a point *semi-mnimaia*, as it is made of both real and *mnimyie* numbers. A *mnimaia* point, on the other hand, is just the part containing i (e.g. $6i$).¹⁸ By this he concludes that the opposite side of a real x-y plane must be the domain of *mnimyie* numbers.¹⁹

Section 2.4

The Complex Space as a Holistic space

The real and *mnimoie* spaces described above, along with the plane separating them, altogether comprise a holistic representation of geometry – the complex space. To better describe this space in a non-fragmented way, Florensky devises his own classification system. Algebraic manipulation of complex numbers can lead to coordinates (describing a surface figure) that are real (ex: 2), *mnimyie* (ex: $5i$), or complex (ex: $2+5i$). A *point* in space, as defined by two coordinates, can thus be one of six types:²⁰

Type	Title	Example
I	Real	$(2,3)$
II	<i>semi-mnimyie</i>	$(2, 3i)$ or $(2i, 3)$
III	<i>mnimyie</i>	$(2i, 3i)$
IV	semi-complex	$(2, 3+5i)$ or $(2+6i, 5)$
V	complex	$(2+6i, 3+5i)$
VI	<i>mnimo-complex</i>	$(2+6i, 3i)$ or $(6i, 3+5i)$

In the previous sections, I discussed what geometric representations are held by real and *mnimyie* points (type I and III). These are points that lie on opposite surfaces of the dividing transparent plane. The following is presented through mathematical deductive reasoning (not through a proof): *Semi-mnimyie* points must be those that exist *inside* this plane, between the real and the *mnimaia* surfaces. This leads Florensky to conclude that lines, too, must exist in this infinitesimal space between those two surfaces (*Mnimosti in Geometry* 29).

Semi-complex points span this infinitesimal width by existing partially on the real surface and partially in-between the two surfaces. Similarly, *mnimo-complex* points exist partially on the *mnimaia* surface and partially in-between the two surfaces. The visualization Florensky provides for both of these points is that of a “nail, inserted half-way,”²¹ with half of its stem inside a wooden board (*Mnimosti in Geometry* 30).

A fully complex point, then, is one that combines all in itself, and spans the entire width of this infinitesimal slab: it is a *pillar* of four points, from which two are on the opposite sides of the plane, and two comprise the inner width. It follows that any given geometric “plane P is actually a

¹⁸ The lack of a unique term for such a point in contemporary (1900s) mathematics is clearly upsetting to Florensky, as such a point by itself does not exist in geometrical space, and this is precisely the issue he outlined with contemporary view of analytic geometry in his first chapter of the text.

¹⁹ Note that this example adds to the importance of *odnorodnost'* in *Mnimosti in Geometry*, as the parts of a domain of *mnymiy* “type” must retain that quality.

²⁰ This classification system is taken from page 27 of *Mnimosti in Geometry*, while the examples are my own.

²¹ “гвоздю, вогнанному до половины глубины” (*Mnimosti in Geometry* 30)

carrier of complex points”²² in space, which, in turn, have ‘height’ (*Mnimosti in Geometry* 31). The other five types of points exist either *in* this plane *P* or *on P*. Note that the described infinitesimal width does not undermine the transparent nature of this plane²³.

Mnimosti in Geometry is filled with a number of extensions of these geometrical ideas. Florensky points to manifestations in electrical engineering, in philosophy and in physics, among others. While presenting great potential for future work, these applications are outside of the comparative study, so I do not discuss them here.

²² “плоскость *P* есть носительница имено комплексных точек”(Mnimosti in Geometry 31)

²³ Mathematically speaking, the width x is a limit approaching zero ($x \rightarrow 0$)

Chapter 3

Iconostasis

In this section I will summarise the main ideas of Florensky's text *Iconostasis* that will be used as a basis for comparison in the next chapter. At the time of its publishing in 1922, Pavel Florensky was an active priest and a theologian. Though the main objective of *Iconostasis* is to communicate the unique nature of icon painting, in it the author emphasises many ideas fundamental to his philosophical worldview. He even states explicitly that "icon-painting is in fact metaphysics" (*Iconostasis* 63). Among those ideas are criticisms of Western art and more broadly, Protestantism and Catholicism, thoughts on duality, and the importance of integrality.

Section 3.1

Critique of Western Art

Through discussion of artistic norms and intentions, one of Florensky's objectives in this text is to show the inferiority of Western art. In particular, he compares icon-painting of the Eastern Orthodox tradition to religious paintings from the Western Renaissance.

Unlike an icon, according to him, a Western painting, even one that depicts a religious subject, is entirely unilateral (*Iconostasis* 47). That is, its aim is to communicate something greater about reality to the viewer, but that reality is confined only to the world the viewer can know and does not extend to the reality that is spiritual. Moreover, the creator of such art is partaking in *Izhesvidetel'stvo* – providing false evidence (*Iconostasis* 25). That is, a Western religious painter aims to bring a viewer to an awareness that exceeds one of the paint, the canvas, and the brush strokes. He hopes to make the painted image come to life – to speak to its symbolisms. All these symbolisms, however, even if religious, do not serve as witnesses or guides to a spiritual world, even if the image they are seemingly connected to is in their representation (*Iconostasis* 16). We will discuss more particular examples as they become relevant to the argument.

Openly critical of free will and individualism inherent to other denominations of Christianity, Florensky here states that Western visual religious representations are thus estranged from the Cult²⁴. Not only do they deviate from the unitary spiritual reality, but they also do not engage in the united search for such reality. That is, they do not require any specific action from the viewer that would allow him or her to feel the symbols within as representations of the "other side" – visual religious representations from the West do not necessitate prayer to extract meaning. As a result, for Florensky these pieces of artwork serve as nice visual representations that are void of spiritual power²⁵ (*Iconostasis* 31).

²⁴ Here *Cult* refers to religious rites and customs affiliated with serving God; spiritual devotion. It does *not* refer to an exploitative, exclusive religious group, as is used commonly in contemporary discourse. A primary driver of any given human act, *Cult* instigates the unison between things and ideas, between phenomena and noumena. The genesis of *Culture*, according to Florensky, is inherently dependent on *Cult*, which is absolute. *Cult* brings to life myths with their own terminology and formulae, which in turn bring to life literature, philosophy and science, all contributing to the development of *Culture*. *Cult* is thus primary, holistic, and absolute, thus intimately connected with God (*Filosofia Kul'tury*)

²⁵ This is similar to Hesychast warnings of seeking superficial "spiritual" experiences for pleasure.

An integral element of an icon that is misused by a Western painter is light, which is symbol of the good and the pure that comes from God. It strives to have as little shade as possible, in an attempt to rid the image of what is unheavenly. For this reason materials like gold play an integral role. Moreover, the icon is meant to serve the role of a light source, to portray things that are born from light, emitted by light. Light constitutes reality, whether or not there exists an object that needs to be lit (*Iconostasis* 53).

A Western representation, on the other hand, paints things lit by a light source, resulting in an image of much less value. In general, the use of shadow is a technique that is applauded and regarded as “adding to the reality” of the painting in Western art. However, Florensky observes that shadow is the absence of light, and anything heavenly – inherently associated with light – only becomes further estranged from the image as the focus is shifted to the shadow, away from the light (*Iconostasis* 59).²⁶

Section 3.2

Duality in *Iconostasis*

The entire text begins with an in-depth analysis of dreams. Florensky discusses the role dreams play in connecting one’s conscious world with the world a person discovers through dreaming. Given that his awakening to the existence of God happened in a dream but on the verge of waking, as described in my Chapter 1, it is not surprising that dreams and the border between conscious and unconscious states are of great importance to him.

The first thing to note is that the two worlds of dreaming and being awake are juxtaposing: one is an “ontological mirror image”²⁷ of the other (*Iconostasis* 6). The same action can be interpreted in two dual ways – one in day consciousness and one in night consciousness (*Iconostasis* 3). Time runs in an opposite direction in dreams, *vivorachivayas*, or turning inside out, at the boundary between these two states of consciousness. On one (awake) side we know the reality that is visible (*vidimaia*); on the other (dreaming) we are familiarised with a world that is invisible to us otherwise (*nevidimyi*). When entering a dream, we leave the world that is real and enter one that is *mnimyi*²⁸. Florensky discusses the same duality in other juxtaposing phenomena we witness: the sky and the earth, separated by a translucent boundary; the heavenly and the distant images of our (seen) world; the church and the spiritual realm it is connected to, separated by the altar.

In fact, the boundary dividing such two worlds itself has a dual purpose. On the one hand, it divides these two worlds from one another. The holy creatures, according to Florensky, that exist on this boundary are the only ones able to distinguish the two worlds from each other and provide us evidence for it – they are “visible witnesses of the invisible world”²⁹ (*Iconostasis* 14). At the same time, however, the boundary is necessary for a holistic picture of reality – it serves the role of uniting the two mirror images into one complete whole. The holy creatures bring together the lives that

²⁶ I here too want to point to similarity with Hesychasm and Gregory Palamas’s teachings, in which “uncreated light” is a central feature – a limitless, immaterial embodiment of God (Nes 102).

²⁷ “онтологически зеркальном отражении мира” (*Iconostasis* 6)

²⁸ Florensky does in fact use this term, previously encountered in geometry, to speak about the “other” reality in *Iconostasis*.

²⁹ “видимыми свидетелями мира невидимого” (*Iconostasis* 14)

exist here and there (*zhizn' zdeshniuiu, zhizn' tamoshniuiu*); they are the living *symbols* of the harmony between the two dual worlds (*Iconostasis* 15).

Another type of duality – dualism³⁰ – exists between what is good and what is evil. Unlike the previously discussed duality, for Florensky there does not exist a boundary with an element of “mixing” between these two worlds – what is evil and impure lacks reality entirely, since the real is only the good and everything that drives it (*Iconostasis* 11). In a similar way, hell is juxtaposed with reality, since hell is void of a shape or an appearance, while a reality necessarily possesses a divine representation – a *lik*. It is important to note, again, that this is not the same duality as the one between the visible and invisible worlds. The duality discussed earlier brings two separate realities together into one whole, whereas all that is real is dual to all that is evil.

The role of an icon, according to Florensky, is one of a witness able to communicate the reality of the other world, dual to the one we can see. An icon is a *symbol* of holy creatures that exist at the boundary, who are the ones that inform us of the spiritual world that lies beyond the icon. The act of painting an icon is therefore an act of secondary witnessing (*vtorichnoye svidetel'stvo*) in the communication chain, making the identity of icon painters so selective, necessarily in line with the canon of the Church (*Iconostasis* 60).

Section 3.3

Integral Vision

I now come to a critical component of Florensky's philosophy, one that was influenced by the teachings of Soloviev, as discussed earlier, and one that is fundamental to his worldview – the integral, holistic nature of the universe. As I pointed out, the holy creatures discussed in *Iconostasis* are needed for the connection between the two parts of the real world. For that reason, among others, Florensky explains the Church's need for conservatism: fearing the collapse of Cult, it does everything to retain its integrity (*Iconostasis* 31).

As insinuated in the previous section, Florensky defines *reality* as a holistic union between the reality visible to us and the *duhovnaia* – spiritual – reality we are allowed to infer from things like icons and dreams. In fact, the specific term he uses for the reality that is all-encompassing is *podlinnaia*, or genuine, authentic, true, real. That reality embraces both our space (*prostranstvo*) and the world “beyond” the icon as necessary constituents of *podlinnost'*. I will come back to the discussion of reality in Section 4.3.

³⁰ I make a distinction between dualism and duality, as the former has great connotations to Christian theologians. St Augustine rejected Manichaeism upon his conversion to Christianity on the grounds of disagreement with the equality of forces between Good and Evil. He said that our world is made only of what is Good; what is Evil lacks any influence of the Divine, of our Creator, and must therefore not make up our universe. For Soloviev, then (and therefore for Florensky), dualism between Good and Evil was a Manichaean notion that contradicts holism, while ‘duality,’ on the other hand, can be used to discuss the juxtaposing phenomena in our holistic world (Gustafson 170-172).

An important symbolism that represents this reality is light. It makes up the space of *podlinnaia* reality, and it is a necessary keeper of balance between the two space-times running in inverse directions (*Iconostasis* 55). An icon, thus, as a representative of not just the boundary but the holistic nature of our universe, must *be* the source of light; it, and all its components, must be original and real.

In line with the dual nature of the boundary discussed above, the icon must also be of holistic nature. The order in which the plane is prepared is very particular for preparing the appropriate surface (*Iconostasis* 53). In the end the icon is *tselesobraznaia* – a holistic representation of everything that constitutes it within.

A human being, Florensky describes, is also a holistic exemplar. In fact, any organism, he says, is *tseosten*, or holistic; nothing happens in it by chance, thus extending the integrality to a nature that is inherent rather than probabilistic. This lack of chance is necessary for the harmony between the inner and the outer – between a human and nature (*Iconostasis* 51). And the harmony, in turn, is necessary for a real, whole world.

Chapter 4

Comparative Argument

Despite the fact that one of the texts I discuss is on mathematics and the other is on philosophy of religion and aesthetics, I argue here that the two have many uniting features. Among them are motivational thoughts, shared terminology, and overarching concepts of perspective, duality, and wholeness. Via different tools, both reflect the holistic nature of the world. My aim, then, is to present the reader with evident similarities between the two texts as manifestations of ideas Florensky held essential to his worldview. An insight into a particular concept within mathematics, as depicted in *Mnimosti in Geometry*, could elucidate his overall philosophy and enrich the interpretation of *Iconostasis*, and vice versa.

Section 4.1

Uniting Motivations

Deciphering the motivations is not very difficult in *Mnimosti in Geometry*, since Florensky spends the entire first chapter motivating the questions he explores in depth later. In *Iconostasis*, the motivation behind writing the text are less overt, but nonetheless fairly clear.

The second text often encourages creativity and imaginative thought. This is evident through the author's incessant use of symbolism, stressing the importance of interpretation beyond the obvious. For instance, a window can symbolise a face that receives the light of God, it can symbolise *tseleobraznost'* and the inseparability of a window's material composition from its essence, or it can simply be a symbol displaying reality, the outer image (*Iconostasis* 12). If a practical symbol "reaches its goal," he says, then in reality it is "inseparable from that goal, from the highest reality of what it represents."³¹ Either way, a window, like an icon, according to Florensky, *cannot* just be a window (16). Such statements challenge the reader to question the identity of a window, forcing one to look beyond the obvious.

Moreover, his parlance requires the reader to abstract from the actual words in order to comprehend the author's intent, in itself requiring 'creative reading'. For instance, he says "a brushstroke yearns to leave the limits of the visual plane," thus attributing an act of desire to a brush (*Iconostasis* 39). Another example occurs in his discussion of dreams. He says that time is "*vyvernuto cherez sebja*," translating to "time is turned inside out" (*Iconostasis* 5). The same is true for objects that appear as their ontological reflections, according to Florensky. Comprehending the way time (known to us as a linear parameter) and objects (known to us in a static form) can turn themselves inside out certainly takes imagination, particularly before discoveries in physics could have suggested an explanation.

Now I turn to *Mnimosti in Geometry*. As outlined in my Chapter 2, Florensky states that the main objective of this text is to find a geometric space for *mnimyye* representations in a way that retains a spatial connection with representations that are real. We have grown far too "calm,"³² he

³¹ "Если символ, как целесообразный, достигает своей цели, то он реально неотделим от цели — от высшей реальности, им являемой" (*Iconostasis* 16)

³² "успокоенность" (*Mnimosti in Geometry* 9)

says, in accepting the disconnect between the visual depictions of the real and the *mnimoie* spaces, making analytical geometry “no longer analytical and not quite a proper geometry”³³! (*Mnimosti in Geometry* 9) We must question and *imagine* solutions to this discrepancy rather than simply leave the matter as is and blindly trust the current framework of interpretation.

This concern with lack of a holistic representation is a substantial influence in this work, and in Section 2.1 I discussed other problems of similar nature he finds in mathematics practices of his time. Not only is this a clear encouragement to look beyond the visible – the known – in search of an explanation that is greater and more complete, but it is a declaration of the necessary integrality of our world – the “wholeness” – that Florensky is known to endorse.

In the concluding chapter of the mathematical text, Florensky also stresses the need for creative thought in physical developments. Defining a factor β ³⁴ for speeds (in a given system) that exceed the speed of light brings him to conclude about the possibility of a space-time in which time runs in the opposite direction, where length and mass of objects have *mnimyie* values. This deduction, Florensky says, is difficult to cope with for our mind due to its lack of concreteness and its allusions to *mnimost'*, which is difficult to define in itself. However, he stresses: “it is time we get rid of *horror imaginarii* and of *horror discontinuitatis*”³⁵ and embrace the *possibility* of a world entirely unknown and unimaginable to us! (*Mnimosti in Geometry* 52) For cases where $\beta=0$, Florensky attributes characteristics much resembling those of a black hole (not yet discovered at that time, but characterised by ideas from Einstein’s relativity). He interprets these cases to be the boundary between Earth and Heavens (*Mnimosti in Geometry* 52).

Naturally, imagination and creativity is tied with the *process* of searching for truth. While certain processes (like icon-painting) are restricted to specific people, according to Florensky, a crucial aspect of the imagining process is available to all. He highlights this in both texts: in *Iconostasis* he says “an icon presents truth to anyone, even to an illiterate human being”³⁶ (*Iconostasis* 25). A person can experience an icon much in the same way that one can experience *gadaniia s zerkalom*³⁷, again a process that requires no prior knowledge or special talent. In the first chapter of *Mnimosti in Geometry* Florensky gives the example of a mathematics student who grows confused early in his studies by the terms *mnimyie representations*, *mnimaia point* and others that are defined by derivations but not by geometrical representations. The holes in the framework, he claims, are evident even to a beginning student, and thus one can infer that even this student is just as capable of raising deep questions about the integrality, cohesiveness, and explainability of the given mathematical field as a whole (*Mnimosti in Geometry* 9).

³³ “уже не аналитична и еще не геометрия” (*Mnimost in Geometry* 9)

³⁴ This is known as the Lorentz factor, though Florensky does not reference the name

³⁵ “пора избавиться от *horror imaginarii* и *horror discontinuitatis*!” (*Mnimost in Geometry* 52)

³⁶ “иконы — это возвешение истины всякому, даже безграмотному” (*Iconostasis* 25)

³⁷ Fortune-telling with a mirror

Section 4.2 Uniting Concepts

I now outline the specific examples through which Florensky's logical reasoning appears to be similar across these two texts.

Section 4.2.1 Perspective

As stated before, the *process* of searching for truth, just like the process of making a measurement, is inseparable from the perspective of the one doing the searching or the measuring. In the third chapter of *Mnimosti in Geometry* Florensky accuses the mathematical community of inherent anthropocentrism: our present methods of calculating the area of a triangle can lead to both a negative and a positive value, depending on the order in which the coordinates are entered into the determinant. While walking around the triangle's perimeter, we presume a fixed perspective on the plane that contains the figure, which allows us to judge whether that circumambulating is clockwise or counterclockwise. However, note that shifting our perspective from the front of the plane to the back of the plane that contains the triangle results in perceived reversal of direction (ie, counterclockwise changing to clockwise, or vice versa) without any change of direction actually having taken place on the plane itself. To resolve the issue of negative area, all one needs to do is 'look' at the plane from the other side, taking away the feared contradiction!

Another way of resolving the problem, as discussed in Section 2.3, is thinking from the perspective of the figure rather than from the perspective of an observer (*Mnimosti in Geometry* 18). Fixing this perspective allows Florensky to resolve the problem via introducing an extra parameter into the determinant. From this "omniscient" perspective, Florensky concludes that the two sides of the plane upon which lies the triangle each have a unique sign attached to it – positive and negative. Directionality of the coordinates on the plane can alter those signs, but the initial difference in perspective that the signs describe is crucial to eliminating confusion and having a consistent process of measurement.

The importance of perspective is likewise evident in *Iconostasis*. Explicitly, Florensky talks about the *eye* of God, the *eye* of the Apostle, alluding to the unique perspective both of those entities have (*Iconostasis* 54, 67). In fact, the uniqueness of a given perspective, much like in the mathematical text, has great implications: "a perspective is singular"³⁸ (*Iconostasis* 54). One cannot simultaneously have two different perspectives. In order for us to explore a greater reality, we must use our imagination to eliminate our inherent anthropocentricity.

Recall the discussion on light in *Iconostasis*. An icon is not a painting which must communicate a message through light; an icon itself *is* a light source (*Iconostasis* 61). Florensky also says that an icon has its own perspective, one that *sees* the world. As in the text on geometry, though there can exist different perspectives of motion being clockwise or counterclockwise, resulting in area that is positive or negative, the motion is actually absolute and happens in only one way (*Mnimosti in Geometry* 19). That is, area cannot actually *be* negative, it can only *appear*

³⁸ "единство перспективы" (*Iconostasis* 54)

negative for a given observer. In the same way, an icon only has one true perspective, which coincides with the perspective of the light source, and it is the job of the icon painter to communicate that singularity of perspective to the observer (*Iconostasis* 60).

The spiritual perspective, as it seems from *Iconostasis*, is omniscient, able to inquire into both realms. Antonova³⁹ writes on Florensky's thoughts: "to a divine vision, objects would not appear from a single point of view; all sides of an object would be perceived at the same time" (Antonova 467). The human perspective, on the other hand, has almost a "reflective" quality, where the inquiry into the spiritual realm is met by a boundary not immediately permeable to an observer.

I would like to briefly point out the distinctions. In 1967, University of Tartu published "*Obratnaia Perspektiva*"⁴⁰ – a recovered original work by Florensky on the subject.⁴¹ All the uniting concepts used in our comparison one also finds in this text. What characterises the spiritual space, he says, is the fact that an object further away appears larger, and an object located close by appears smaller. In clear duality of the way we commonly view visual representation, Florensky titles this the *reverse perspective*. There are suggestions in *Iconostasis* that this is the case for the world "beyond" the icon, but nothing in *Mnimosti in Geometry* makes that apparent. Perhaps there existed a mathematical explanation for such a perspective in Florensky's mind that he did not clearly outline in this text, but this inquiry requires separate consideration.

Section 4.2.2

A dividing plane

The dividing plane in *Mnimosti in Geometry* is rather obvious, as the boundary between the *mnimoie* geometric space and the real geometric space is the central point of discussion for much of the text. In *Iconostasis* the dividing plane in question is the icon itself, but also other symbolisms thereof, such as the boundary between the conscious and unconscious, the visible and invisible worlds, spiritual and material realities, and others I discuss here.

I will compare particular characteristics of such a plane between the two texts, namely its ability to both separate and unite, its surface, its transparent qualities, and the process of movement associated with it.

Florensky claims in *Iconostasis*, "nothing exists on the surface without being a manifestation of the inside"⁴² (*Iconostasis* 34). In order for an icon to achieve the desired effect of communicating spiritual reality to the observer, the paint laid on the surface must be of very specific consistency. Moreover, the use of gold in addition to the whitewash at specific times is crucial for making the icon *be* a source of light. This very careful make-up of the paint "gives the icon depth" and meaning (*Iconostasis* 35).

³⁹ Her larger claim argues that in comparison with those in the West, thoughts on "reverse perspective" of many Russian thinkers were more spiritually-influenced and thus more imaginative, beyond a 3-dimensional space.

⁴⁰ "Reverse Perspective." *Trudy po znakovym sistemam* (III): 390. Tartu, 1967.

⁴¹ Florensky, Pavel. "*Obratnaia Perspektiva*." *Trudy po znakovym sistemam* (III): 381-416. Tartu, 1967.

⁴² "нет ничего внешнего, что не было бы явлением внутреннего" (*Iconostasis* 34)

In Chapter 6 of *Mnimosti in Geometry*, Florensky is similarly concerned with the inner content of a dividing plane, claiming that it must be a carrier of complex points (see Section 2.4) (*Mnimosti in Geometry* 31). He stresses that these points are *of* the plane, not *on* the plane (*Mnimosti in Geometry* 27). There is geometrical space for every kind of point – for real, *mnimyie*, complex, semi-*mnimyie*, semi-complex, and *mnimo*-complex points – *inside* the plane.

This all-encompassing, holistic geometric plane thus has a uniting role between various types of points, which in turn are representations of different kinds of geometrical spaces. Moreover, it is of transparent nature, and when we see the axes in space we are actually seeing both the roots of the *mnimoie* space and of the real space at once (*Mnimosti in Geometry* 25).

There is reason to believe that transparency was also an important quality of the boundary in *Iconostasis*, also necessary for the boundary to be a uniting factor. For example, when approaching the border between the conscious and unconscious states, the two seem to merge and the other side influences us to behave and feel differently (*Iconostasis* 7). He seems to claim that we experience a novel space-time, which defies physical laws of conservation and linearity. The quality of merging is also outlined by the whitewash (which Florensky titles *promezhutochnaia*) used in painting the icon – between the inner world and the outer world (*Iconostasis* 51).

Note that Florensky works hard to unite two worlds that otherwise seem separated. An icon brings qualities to our visible world that are *odnorodnyie*, or of same nature, to the *duh*, or spirit, that exists in the invisible realm. At the same time, the iconostasis, as a part of the altar, separates these two worlds, brings it to our awareness that the two are inherently different and that it takes effort to achieve an awareness of what lies beyond the altar (*Iconostasis* 15).

Thus we see that the nature of the boundary is quite particular in both texts. Could it be that Florensky's visualisation of six types of points inside the plane (from *Mnimosti in Geometry*) inspired the visualisation of holy creatures inside the icon (see Section 3.2)? His careful description of both holy creatures and of the points in the plane *P* as well as their dual role of uniting and separating two very different spaces is certainly reason enough to suggest this similarity.

The consistency of the paint also extends to his concern with not just the depth but also the surface quality of the image. Various elements in precise proportions are necessary for the paint to be of holy quality and to be capable of producing a truly holistic representation. Note that the image *on* the surface of the plane is not realisable without a careful consideration of perspective and without an understanding of the inside of this plane.

This is relevant to Florensky's discussion of *odnorodnost'* in Chapter 2 of *Mnimosti in Geometry*. What we should strive for, he says, is comparable to the way in which we measure time: the fundamental unit of measurement should be of the same nature as the thing being measured (*Mnimosti in Geometry* 12).

In the case of area, what he alludes to here is a differential. Though a differential can be approximated and described by points and lines, i.e. by things that constitute it, ultimately it is a unit fundamentally different from both points and lines. Similarly, every drop of paint used to paint the icon, while can be described by the collection of elements that comprise it, is a unit of something

inherently different. It is a unit of holy quality that is essential to proper portrayal of the holiness of an icon.

Motion is an important uniting factor, necessary for both dividing planes to be realisable. An icon (though not the wall on which it hangs, which is immovable) creates the image of movability, necessary for its purpose of “moving” the senses of an individual beyond those of the visible real world (*Iconostasis* 47). When one approaches the icon, the physical distance between the actual body and the icon becomes insignificant, since, one could suggest, the process of merging with “*ta deistvitel’nost*” – that other reality – is taking place (*Iconostasis* 70, 17).

Motion is also significant for time. Florensky says that in dreaming, time *runs* towards reality, which is directionally against the axis of real time. This motion, necessary for the inversion of space-time, Florensky calls *vyvorachivaniie*, or “turning inside out” (*Iconostasis* 6). Chapter 9 of *Mnimosti in Geometry* uses the same exact words to help the reader visualize the crossing from the real surface to the *mnimoia* surface. This movement, according to Florensky, is only possible through breaking of space and turning the bodies (or objects) inside out of themselves (*Mnimosti in Geometry* 53). Though somewhat away from the precision of even descriptive mathematics, this analogy supports his interpretation of having coordinates of the same object exist in reverse order if depicted on the opposite side of the dividing boundary. The use of the word *vyvorachivat’*, common in neither mathematics nor philosophy, seems far from coincidental.⁴³

Going back to Chapter 2 of *Mnimosti in Geometry*, recall that the addition of an extra parameter, which Florensky interpreted as motion, into the determinant was the key to explaining the difference between negative and positive area measured on the surface of a plane. “Walking around the triangle” in a clockwise as opposed to counter-clockwise motion was precisely the element causing the discrepancy. Though indirectly, this example also brings in the boundary as a necessary explanation, and it does show that, much like approaching the icon, movement has great influence on the interpretation of the two spaces on either side of the dividing plane.

Section 4.2.3

Duality

Much of what I have already discussed points to the centrality of duality in Florensky’s formalism. A dividing plane, be it in geometry or in an icon, has the dual role of both dividing and uniting; the perspective of a given observer defines a given world by the dual qualities of visibility or invisibility; the spaces on the different sides of the dividing plane display duality in being each other’s “ontological mirror images” (*Iconostasis* 6). As I have said, time and objects on one side are much like on the other, except *vyvernutyie*: “We can imagine space as dual... transition [from real to *mnimoie*] is only possible through ‘breaking’ of space and through a body turning inside out from itself”⁴⁴ (*Mnimosti in Geometry* 53). In chapter 6 of the text, Florensky discusses the *dvoichnost’*

⁴³ Though the term “*vyvorachivaniie*” is uncommon in the contexts of analytic geometry and religious philosophy, it has great implications in physics. There, the term “turning inside out” is in fact used to describe the collapse of space-time into a black hole. Though black holes were not discovered or postulated at the time of Florensky writing this text, it is possible that similar ideas contributed to his view of reality.

⁴⁴ “Пространство мы можем представить себе двойным... переход возможен только через разлом пространства и выворачивание тела чрез самого себя” (*Mnimosti in Geometry* 53).

(duality) of the complex space, as half of it consists of real, half of *mnimoie* space-time. Moreover, he says, “Complexes generate a twofold, doubly-extended plurality”⁴⁵ (*Mnimosti in Geometry* 11).

The duality, however, does not stop with the dividing plane and extends to many other instances. Recall the beginning of *Iconostasis*, which does not at all discuss icons but is rather focused on dreams. Besides time turning itself out at the barrier of consciousness (much resembling the boundary between the real and *mnimy* worlds, as Florensky himself points out), duality is manifested in the way events are perceived in a dream and in an awoken states. That is, the same exact event can be perceived in two (opposing) states of consciousness: in a “day consciousness” the event appears to be χ , while in the “night consciousness” it appears to be x . What ties χ and x together is beyond accidental similarity, according to Florensky, and it is important to note that, on the axis of time, where the moment of awakening is zero, the two will be located at the same absolute distance away from the origin, i.e. mirrored around the origin.

Beyond dreams, Florensky finds duality between nature and man. The inner world he equates with *lik*⁴⁶ and the outer with nature. The painting of clothing and other portrayal of reality, he says, is an important connection between “two polarities of creatures – human and nature” (*Iconostasis* 56). While this brings out the anthropocentric nature of Florensky’s thought, it also shows his dual perception of nature and man.

There exist indirect references to duality in *Mnimosti in Geometry* as well. The issue of area of a given triangle being either positive or negative (itself a problem of dual representation) was explained by the dual motion of clockwise or counter-clockwise tracing of the triangle’s coordinates. However, as Florensky says in Chapter 2, “we must search deeper for a cause of this duality,”⁴⁷ and he find it in the differing perspectives. In one case, we observe a coordinate system that coincides with reality, in the other case one that diverges from it (*Mnimosti in Geometry* 25). He concludes that *pri istinnyh dvizheniiakh* – when the movement is true, perfect – the determinant sign, and thus the area of the triangle, will remain positive. In this example the duality manifested actually led to an exploration of a holistic representation, one not fragmented by the dual qualities within. This is much like the way the complex space unites the real and the *mnimoie*, and much like the way *podlinnaya* reality encompasses both the spiritual and the visible realities.

Since these arguments for duality presented in both texts are intimately connected with both the icon in *Iconostasis* and with the geometric boundary in *Mnimosti in Geometry*, these two dividing planes hold much more than just similarity in qualities to one another. They are both symbols of greater duality inherent in our universe, known to be important in Florensky’s worldview. The clarity of this symbolism is amplified by cross-referencing terminology between the two texts, which I turn to now.

⁴⁵ “Комплексы образуют множество друкратное, множество двояко-протяженное” (*Mnimosti in Geometry* 11)

⁴⁶ “divine representation” or “divine face”

⁴⁷ “причину этой двойственности нужно искать [...] глубже” (*Mnimosti in Geometry* 14)

Section 4.3 Terminology

In the opening chapter of *Mnimosti in Geometry*, Florensky mentions the importance of using consistent terminology. Specifically, he criticises usage of same terminology across different mathematical fields without the intended conceptual cross-referencing. Furthermore, as we introduce new ideas and criticise contemporary developments, we must not break away, he says, from the tradition and the history of mathematical thought, but rather build on previous findings and studies (*Mnimosti in Geometry* 9).

This leads one to believe that correspondence in terminology between *Mnimosti in Geometry* and *Iconostasis* is not accidental. I explore the suggested intentionality of those ideas here.

mnimyi

In the opening of my Chapter 2, I mentioned the use of the term “*mnimosti*,” calling for consideration of other potential implications and extended usages of the term commonly translated as “imaginary numbers” in the title of *Mnimosti in Geometry*. Let us now search for those other interpretations of this term.

Concluding his argument about the *mnymiy* nature of points and lines comprising negative area (see Section 2.3), Florensky arrives at the following conclusion: “The new interpretation of *mnimosti* lies in the discovery of the opposite side of a plane and in designating this side as the domain of *mnimiyie* numbers.”⁴⁸ It is clear that for Florensky *mnimosti* on its own needs an interpretation; it is a concept, here characterised by an imaginary space, but not equivalent to it. His search for this new interpretation lies in the disconnect found in contemporary analytic geometry between the complex plane and the real plane, and the solution he finds allows the *mnimoie* space to exist as a geometrical dual to the real space. The aim of this new definition, then, is to erase the discontinuity between *mnimiyie* and real depictions in space, and a distinction between the terms “*mnimosti*” and “*mnimiyie* numbers” is necessary to achieve that. Only then can we properly define a “*mnimaia* point” and a “complex point” (along with the other four types – see Section 2.4) and depict their relationship in space.

The term is used as a noun in *Iconostasis* very much in the dual sense to reality: “...when our life transitions from the visible to the invisible, from real – to *mnimoie*”⁴⁹ (*Iconostasis* 2). Here it is clear that reality is directly tied to the visible world, while all *mnimoie* is tied to the invisible. Acknowledging the difficulty in recognising this dual notion, Florensky says that lack of understanding of *mnimosti* (and, moreover, fear thereof!) has prevented philosophers⁵⁰ in the past (like Carl DuPrel) from making the most important and fundamental discoveries (*Iconostasis* 2).

In another passage he calls *mnimoie* an “inverse world,”⁵¹ an “ontological mirror image,” in which all that is *mnimoie* becomes *podlinno* (genuinely, authentically) real for those who have

⁴⁸ “Новая интерпретация мнимостей заключается в открытии оборотной стороны плоскости и приурочении этой стороне - области мнимых чисел” (*Mnimosti in Geometry* 25).

For a discussion leading up to this conclusion see Section 2.3

⁴⁹ “...когда наша жизнь от видимого переходит в невидимое, от действительного — в мнимое” (*Iconostasis* 2).

⁵⁰ He mentions Carl DuPrel in the text (*Iconostasis* 2). обратный мир

⁵¹ “обратный мир” (*Iconostasis* 5).

“turned inside out” and reached the spiritual focus of the world – the boundary between the two worlds he describes (*Iconostasis* 5). Notice here that the movement itself is *absolute*, as is the human being in question, once he is able to realise both perspectives and achieve the transition between real and *mnimyi* worlds. Such movement is absolute in the exact same sense as the movement around the triangle in *Mnimosti in Geometry*: as already discussed, perspective and direction account for differences in measurement, but the actual movement is objective and happens in only one way.

Closely related to the noun *mnimoie* is a frequently-encountered term “*mnimoie prostranstvo*,” or *mnimoie* space, in *Iconostasis*. Florensky writes, “we have changed to the realm of *mnimoie* space”⁵² when time, together with all figures it contains, becomes turned inside out (*vyvernuto*) (*Iconostasis* 5). This is exactly his reasoning at the end of Chapter 9 of *Mnimosti in Geometry*:

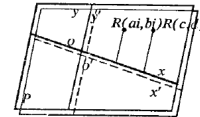
“But, as “falling through” of a geometric figure does not at all mean its annihilation, but only its transition to the other side of the surface and, therefore, its accessibility to creatures on that other side of the surface, so we must understand the *mnimosti* of a body’s parameters - not as a sign of it being *unreal*, but as evidence of the body’s transition into a *different* reality. The realm of *mnimosti* is real... the transition from the real surface to the *mnimaia* surface is possible only by “breaking” of space and a body “turning inside out” (*vyvorachivat’sia*) from itself”⁵³ (53)

Together with the physical description he provides earlier in that chapter, one can see the resemblance to relativity and black holes, as I suggest in footnote 42. Florensky here exploits the popular scientific ideas of the time for a definition of a different space-time, one unfamiliar to our visual and sensory knowledge, and one requiring imagination of a “different” reality. The connection between the term *vyvorachivaniie* in the two texts is obvious: the “falling through” of some boundary via this turning inside out marks the transformation from one space-time to another and unites his mathematical, physical, and spiritual worldviews. Moreover, Florensky’s discussion of “creatures” inhabiting the “other side” points to unitotality: the universe can be described with two different languages – one by humans from our visible world, one by these “creatures” from the *mnimyi* world – but both are just two perspectives onto the same, holistic, reality.

⁵² “мы перешли в область мнимого пространства” (*Iconostasis* 5).

⁵³ “Но, как провал геометрической фигуры означает вовсе не уничтожение ее, а лишь ее переход на другую сторону поверхности и, следовательно, доступность существам, находящимся по ту сторону поверхности, так и мнимость параметров тела должна пониматься не как признак ирреальности его, но - лишь как свидетельство о его переходе в другую действительность. Область мнимостей реальна... переход от поверхности действительной к поверхности мнимой возможен только чрез разлом пространства и выворачивание тела чрез самого себя.” (*Mnimosti in Geometry* 53).

Florensky also treats the transition from *mnimoie* space to real space as a descent, and in the other direction – an ascent (*Iconostasis* 7). In the former case, he says that visual art acts as a symbol, “incarnating a *different* experience in real images,”⁵⁴ thereby making it into reality. In the latter, he says that naturalism gives a *mnimy* image to reality. The geometric duality (and thus the parallel to *Mnimosti in Geometry*) is obvious, but what is more, note one’s ability to “see into” the other space. Though dual in its description to real space, *mnimoie* space is not isolated from it. This coincides with the claimed transparency of the boundary between real space and “the space of *mnimyie* numbers.” In Florensky’s new geometric system, “this plane have become transparent, and we see both coordinate systems at once.”⁵⁵ The image of this plane, with both real (solid lines) and *mnimaia* (dashed lines) coordinate systems, is reproduced here (*Mnimosti in Geometry* 25).



Чертеж 15-й

As an adjective, *mnimy*(/–*aia*) is applied to things other than space in *Iconostasis*: images can also appear to be *mnimyie*. “The same phenomenon can be perceived from both perspectives. When it is perceived from the real space, it appears as reality. When perceived from the other side – from the *mnimoie* space – it seems *mnimym*, ... as a goal, an object we strive towards”⁵⁶ (*Mnimosti in Geometry* 5). We run into a problem, he says, when viewing this *mnimy* image from this (real) side – it appears as an ideal, but one that is “lacking energy”⁵⁷ – unrealistic, even false (in line with the possible definition of *mnimy* as “*lozhnyi*,” as stated in the opening of my Chapter 2). When viewed from the *mnimoie* space, however, *mnimy* image is alive with energy; it forms reality. The edifying statements that continue from this reasoning in the text can be summarised as follows: what appears as an unattainable ideal can be reached if approached from the other perspective. Notice that this is exactly the same reasoning that led Florensky to find a way of calculating absolutely positive area of the triangle – walking around the figure on the other side of the plane.

Here used as a verb, the word “*mnilos*” translates to more than just “imagined”; the response to that which *mnilos*’ elicited realisation, emotion, and transcendence.

“Inexplicably moved, he looked at [his unfinished painting of Madonna] with teary eyes, and every minute it seemed to him that the image wanted to move; even *mnilos*’ to him that it in fact was moving. But most marvellous of all was the fact that Raphael⁵⁸ found in [the image] that for which he searched his whole life and about which he had a vague premonition”⁵⁹ (*Iconostasis* 22).

A *mnimy* image became reality, in the same way as the concluding paragraph of *Mnimosti in Geometry* states “the realm of *mnimosti* is real”⁶⁰ (*Mnimosti in Geometry* 53).

The negative connotation of *mnimoie* – when viewed from a single, closed perspective as an unobtainable ideal – Florensky references to Protestant individualism, which, according to him,

⁵⁴ “..воплощает в действительных образах **иной** опыт..” (*Iconostasis* 25)

⁵⁵ “плотность стала прозрачной, и мы видим обе системы осей зараз” (*Mnimosti in Geometry* 25)

⁵⁶ “Тогда то же самое явление, которое воспринимается отсюда — из области действительного пространства — как действительное, оттуда — из области мнимого пространства — само зрится мнимым, ..., как **цель**, как предмет стремлений.” (*Iconostasis* 5)

⁵⁷ “лишенным энергии” (*Iconostasis* 5)

⁵⁸ Florensky discusses Raphael to show that even in the West there existed faith in the truth behind an icon-like representation

⁵⁹ С каким неизъяснимо-трогательным видом он смотрел на него очами слезными, и каждую минуту, казалось ему, этот образ хотел уже двигаться; даже мнилось, что он движется в самом деле. Но чудеснее всего, что Рафаэль нашел в нем именно то, чего искал всю жизнь и о чем имел темное и смутное предчувствие” (*Iconostasis* 22).

⁶⁰ “Область мнимостей реальна” (*Mnimosti in Geometry* 53)

encourages individualistic behaviour and freedom of choice. He calls this freedom “*mniimaia*.” It abuses the ideal of freedom, he says, and coerces people into a pre-formed notion of individuality, thereby misusing and abusing the actual notion of freedom (*Iconostasis* 41).

Western rationalism, too, *mnit* (here translating to ‘leading astray’) in claiming to “deduce something and everything from this nothing”⁶¹ (*Iconostasis* 56). It presents logical schemes as tools having potential, in the Aristotelian sense, to achieve utmost reality. But these potentials, says Florensky, lack the fundamental characteristics needed to connect them with what is actually real, and they lead one away into *samoobol’scheniie*⁶²: into self-delusion, self-indulgence, as well as pride, that “*mnit* itself as directed in a perpendicular relation to the perceptive world”⁶³ (*Iconostasis* 8). The use of the verb “*mnit*” here is rather different from the others I have pointed out, but here there is connotation of false confidence with which this *samoobol’scheniie* imagines its own directionality. Geometrically speaking, perpendicularity implies complete disconnect⁶⁴. Perpendicular movement, therefore, makes an emotive world eternally unattainable.

This discussion of *mnimosti* frequently referenced reality; at times what is real is the dual to what is *mnimoie*, but in other instances what is real refers to something much greater, nearly all-encompassing. The negative connotation *mnimoie* can have, as discussed above, surely contributes to the lesser potency of the seemingly dual term, but also it is worth looking at the term “real,” its usage and definition across the two texts, for an elucidation of its implications and superiority.

real

Though both terms can be translated as “real,” there exists a distinction between “*deistvitel’no*” and “*real’no*” for Florensky.⁶⁵ *Deistvitel’no* is used very much as the real geometric space – one made of real coordinates and one containing real representations. This term one finds throughout the text, in very straight-forward, mathematical usage. *Real’no*, on the other hand, appears significantly less frequently, and seems to refer not merely to the geometric space, but rather to a more holistic quality of all space. This is most notable in an already-discussed quote from the concluding chapter of *Mnimosti in Geometry*, restated here with the specified Russian word used: “The realm of *mnimosti* is real (*real’na*)”⁶⁶ (*Mnimosti in Geometry* 53).

Let us look at a single statement that utilises both of these terms. For clarity, I will translate *deistvitel’no* here as “actual” instead of “real.”⁶⁷ “True art,” Florensky says, “brings into *actuality* a *different* experience, which can transform into the highest *reality*”⁶⁸ (*Iconostasis* 7). A similar line of

⁶¹ “вывести из этого ничто — нечто и все” (*Iconostasis* 56)

⁶² Recall the influence of Husechasm regarding this subject (section 1.2.2).

⁶³ “**МНИТ** себя направленным по перпендикуляру к чувственному миру” (*Iconostasis* 8).

⁶⁴ For example, the dot product of two perpendicular vectors is equal to zero. Another example is from linear algebra, where two non-zero orthogonal (or perpendicular) vectors are always linearly independent

⁶⁵ I indirectly suggest here that “*real’no*” implies “*podlinnost*”, as defined earlier, even when the adjective “*podlinnaia*” is not utilised, thereby carrying all the connotations discussed in Section 3.3.

⁶⁶ “Область мнимостей реальна” (*Mnimosti in Geometry* 53)

⁶⁷ Such translation, though not consistently, has been noted in the translation of *Iconostasis* by Donald Sheehan and Olga Andrejev

⁶⁸ “художество ...воплощает в действительных образах **иной** опыт, и тем даваемое им делается высшею реальностью” (*Iconostasis* 7)

thought can be found in *Mnimosti in Geometry*, where *deistvitel'nost'* represents the 'real geometric space,' while *real'nost'* carries a more holistic representation similar to that of *absolute* motion.

The distinction between the two terms is also evident in the author's on-going criticism of Western art: "Western religious painting, beginning with Renaissance, was pure artistic falsehood, and, while claiming proximity and truth of the depicted reality (*deistvitel'nost'*), these painters, without any connection to *that* reality (*deistvitel'nost'*), which they were bold enough to depict, did not consider it necessary to know what the spiritual world is like..."⁶⁹ In other words, these Western artists, according to Florensky, claimed knowledge of the *mnimyi* world (that could be described as the *deistvitel'noie* space, depending on one's perspective), without ever having touched it – without having come close to the boundary. Icon-painting, on the other hand, is capable of much more: it can serve as a witness of the reality (*real'nost'*), encompassing both *deistvitel'nost'* and *mnimost'* and inherent to "*nebesnyie obrazy*," or "heavenly images" – a witness of ideas beyond our spiritual intuition (*Iconostasis* 17).

The reason for believing that *deistvitel'nost'* is comparable to no more than real geometric space is evident in the opening of *Iconostasis*, throughout Florensky's description of a dream. There, the term mostly used to refer to the conscious state is *deistvitel'nost'* rather than *real'nost'*. Very explicitly, he says, "In reference to the simple images of the visible world, in reference to that, which we call '*deistvitel'nost'*', dreaming is 'just a dream,' nothing, nihil visible, yes, nihil, though nonetheless visible – nothing, yet visible, contemplating, and therefore bringing us closer to the images of this '*deistvitel'nost'*'"⁷⁰ (*Iconostasis* 6). Thus, the term is clearly defined as the visible world, which one "sees" from the boundary of consciousness. Later in the same paragraph, he uses the phrase "other reality (*deistvitel'nost'*)" to emphasise that both are available to a person dreaming – both *mnimyi* and *deistvitel'nyi* worlds are attainable.

Here one can see the connection to perspective, discussed broadly in Chapter 3 of *Mnimosti in Geometry*. One side of the plane which carries the triangle is *deistvitel'naia*, the other is *mnimaia*, but both can appear positive or negative to the viewer depending on his or her perspective. That is, both of the *deistvitel'nosti* – one of which is located in real space, the other in *mnimoie* space – are real (*real'ny*). In fact, he says that "reality [must be] capable of doubly perception"⁷¹; if reality existed only in the spiritual world, it would not be able to mark the boundary between the visible and invisible worlds – it would not *know* where it is (*Iconostasis* 14). What is evident here, again, is that the holistic notion of reality necessitates two worlds, both of which can be viewed as *deistvitel'ny*, depending on one's perspective.

Florensky returns to drawing an 'ontological mirror image' of these two worlds, saying that we can imagine a "reflection of reality (*real'nost'*)" (*Iconostasis* 46). From all discussed, I would suggest that this reflection can occur in both *mnimoie* and *deistvitel'noie* spaces. The *truth*, however,

⁶⁹ "Религиозная живопись Запада, начиная с Возрождения, была сплошь художественной неправдой, и, проповедуя на словах близость и верность изображаемой действительности, художники, не имея никакого касательства к **той** действительности, которую они притязали и дерзали изображать, не считали нужным знания, каков духовный мир,..." (*Iconostasis* 17)

⁷⁰ "В отношении обычных образов зримого мира, в отношении того, что называем мы "действительностью", сновидение есть "только сон", ничто, nihil visibile, да, nihil, но, однако, visibile, — ничто, но, однако, видимое, созерцаемое и тем сближающееся с образами этой "действительности" (*Iconostasis* 6).

⁷¹ "реальности двойственной способности восприятия" (*Iconostasis* 14).

seems to exist in a higher dimension, since it is not a reflection, but it is “reality itself”⁷² (*Iconostasis* 46). Thus, *real’nost’* is holistic – coming into existence through happenings of daily life rather than through a composition of pieces (*Iconostasis* 50). It includes all images, ideas, realms, for anything that lacks those is unreal – *irrealen* (*Iconostasis* 58). It contains within both *mnimoie* and *deistvitel’noie* spaces, into which it can project (or reflect) its images. It follows that “all evil” – everything characterised by darkness and lack of representation – “is deprived of *real’nost’*, for only the good and everything moved by it can be real”⁷³ (*Iconostasis* 11). The complex geometric space is much the same: a unifying space-time will not incorporate images that are in complete disconnect with the domains that comprise it.

The proposed superiority of *real’nost’* comes across via the frequent use of the phrase “*real’nost’ duhovnogo mira*” or “*real’nost’ inogo mira*.”⁷⁴ This makes the term not a simple reference to the real geometric space, but rather to the non-geometric quality of both real and imaginary geometric spaces known to us. *Real’nost’* speaks to the truth one can attribute to the *mnimyi* world and points to its necessary existence.

An Apostle, says Florensky, gives evidence of the “ontological reality of the other world” (*Iconostasis* 60). Having access to the boundary – the spiritual focus of the world – the Apostle is able to communicate this greater truth to a fragment of the Universe that is unaware of it – the people inhabiting the visible – the *deistvitel’nyi* world. Humans, in turn, learn of this other world as well as of this greater truth through feeling: “at least a distant sensation of the reality of another world is stimulated”⁷⁵ (*Iconostasis* 16). And, of course, it is the icon that serves the great role of providing evidence of the reality of that other world, instilling that feeling in us: “that poignant feeling of the reality of the spiritual world, one that penetrates the soul and, like a strike, like a burn, suddenly affects nearly everyone who sees the holiest creation of the art of icon-painting for the first time”⁷⁶ (*Iconostasis* 19).

plane vs surface

I have come back to discussing the icon, the “visual plane,” as it is often called in *Iconostasis*, and now I would like to call attention to the terms “plane” and “surface” and the consistent distinctions I have found between them in the two texts of this comparative study.

Both terms are common in mathematics, and throughout most of *Mnimosti in Geometry*, there is find discussion pertaining to “plane *P*” and its two sides – one negative, one positive, as Florensky deduced (*Mnimosti in Geometry* 19). It is evident that the surface of plane *P* and the plane itself are very distinct geometric notions for Florensky, since the plane is a carrier of all (six) types of points, while the surface only contains one whole point – whose coordinates are both real – and fragments of two other points (semi-*mnimyye* and semi-*complex*). Moreover, In Chapter 8 of his text,

⁷² “сама реальность” (*Iconostasis* 46)

⁷³ “Злое и нечистое вообще лишено подлинной реальности, потому что реально только благо и все им действующее” (*Iconostasis* 11).

⁷⁴ “reality of the spiritual world” or “reality of another world”

⁷⁵ “возбуждается хотя бы отдаленного ощущения реальности иного мира” (*Iconostasis* 16).

⁷⁶ “то острое, пронзающее душу чувство реальности духовного мира, которое, как удар, как ожог, внезапно поражает едва ли не всякого, впервые увидевшего некоторые священнейшие произведения иконописного искусства” (*Iconostasis* 19).

shows that all surfaces can be classified into one-sided or two-sided, odd-sided or even-sided, via observation of the normal flipping (or not flipping) as a result of measurement. Since nothing of the sort is discussed for planes, again we infer that these physical qualities are insignificant for it – that “the plane” is a more holistic concept than “the surface.”

In discussion of the icon, the usage of those two terms is similarly distinct. The material onto which paint is laid will naturally influence the resulting image. But what is more, what the painter should be concerned with is not just the surface, but the entire plane – the *type* of material one is working with. “A painter must either submit to the plane or search the world for another adequate plane: it is not within his power to change the metaphysical make-up of the existing surface”⁷⁷ (*Iconostasis* 36). The inside of the plane, just as in the geometric explanations, is intimately tied with the representations that appear on (either side of) the surface. Thus, the plane itself influences the perception and nature of the images it carries.

For this reason, it seems, Florensky spends a great deal of time explaining to the reader the way one must adequately prepare – not the surface! – but the “visual plane” upon which the icon is to be painted. The object, he says, is to transform a wooden board into a wall, where a wall is an object he compares to an altar. A wooden board is treated by polishing and grinding with specific instruments, whitening, layering of various materials, all in a very particular order. Only then, he says, “the visual surface of an icon is ready”⁷⁸ (*Iconostasis* 53). Notice that while one must adequately prepare the *plane*, the actual painting takes place on the *surface*.

More obvious is Florensky’s statement, “the entire material matters, including the nature of the plane, and therefore of the surface, upon which paint is laid”⁷⁹ (*Iconostasis* 36). He mentions the Egyptian sarcophagus, noting the historically significant change from using cypress wood only for the surface to using the same wood throughout (*Iconostasis* 68). Such transformation brought *odnorodnost’* to the entire object, allowing the surface to be a continuation, a reflection – in the same sense as in geometry! – of the inside, rather than existing as a distinct object.

There are other terms to discuss, namely ones from other areas of mathematics and science. He frequently says in *Iconostasis* that a given phenomenon is “not accidental” and, similarly, in *Mnimosti in Geometry* will talk about “invariance” and absoluteness. The world is clearly not built probabilistically in his view, but I will not go further on this, as more research is needed about his studies and thoughts on probability theory.

⁷⁷ “Художник либо должен подчиниться, либо отыскать себе в мире подходящую плоскость: не в его власти изменить метафизику существующей поверхности” (*Iconostasis* 36)

⁷⁸ “Только теперь изобразительная плоскость иконы готова” (*Iconostasis* 48)

⁷⁹ “...имеет значение **весь** материал, в том числе и природа плоскости, вообще поверхности, на которую накладывается краска” (*Iconostasis* 36)

Conclusion

What this work has done, above all, is raise many issues that need further examination. I have outlined clearly the connections between the manifestations of Florensky's worldview in *Mnimosti in Geometry* and in *Iconostasis*. But a similar, more extensive comparison is needed for all of his mathematical and scientific literature (some of which still requires discovery, due to his name being erased in given Encyclopaedia entries, as I have discussed in Section 1.2.3).

There are many known mathematical texts that have not been looked at, including *Pythagorean Numbers* and *Privedeniie Chisel*. Together with all the scientific literature Florensky published after the time of the two texts discussed in this thesis, an extensive study needs to be conducted investigating the connection of these works to his overall philosophical worldview, as I did here. Moreover, something I did not do enough in this work that needs to be expanded is the contrasting side of the argument; I presented many more similarities than distinctions in this work.

As mentioned in the last paragraph of the previous chapter, there is much more terminology to be compared across different fields of Florensky's disciplines, as well as across his works and the works of those he was influenced by. I touched on the term *vyvorachivaniie*, but there is much more to explore regarding its connection to both religion and physics, as its usage reflects Florensky's mutually reinforcing physico-mathematical and religious intuitions. We find this term throughout secondary literature and throughout *Iconostasis* in addition to Chapter 9 and Appendix of *Mnimosti in Geometry*, and I would like to connect it briefly with a potential physical manifestation Florensky could have intended.

Though neither black holes nor the Big Bang theory had been postulated in 1922, it seems that his reasoning was moving in that direction, perhaps ahead of his contemporaries. Undoubtedly inspired by then recent developments in Einstein's *special relativity*, Florensky argued for the possibility of existence of a different reality – a different space-time. He reasoned that there must exist a space in which the laws of physics and universal constants, as we know them, may be entirely different. Or rather, that nothing so far has shown us that such a space could not exist. *Vyvorachivaniie* seems to be his rationale for getting to that space – the physical transformation that a body can undergo, upon which the principle of general covariance⁸⁰ will not hold. Matter forming into a black hole (body tied up in zero space), for example, undergoes such a transformation, as did our Universe during the Big Bang. The “breaking of space” and the “turning inside out” (*vyvorachivaniie*) that Florensky emphasizes so often are concepts essential for black hole formation as we know it today. What is startling is that his description of the transformation is oddly accurate to the processes physicists presented over a decade after he wrote this work and are still examining.

Glatzer Rosenthal writes that Florensky expected “some sort of an apocalypse, which he described in scientific terms as a black hole that swallows everything up” (Steinberg and Coleman 354). Though I would challenge the accuracy of that comment on the grounds of the term “black hole” not having been coined until late thirties, Florensky did make allusions to physical manifestations that resemble a black hole, as discussed above. It is not surprising that he united absence of time with an apocalypse (Valliere 84). Time, by Christian Orthodox teaching, exists only

⁸⁰ “General covariance is the invariance of the form of physical laws under arbitrary coordinate transformation” (Wikipedia).

because of the death our bodies experience, but the greater spiritual realm is time-less, eliminated with the coming of the apocalypse.

This strive for unison of the religious with the rational caused Florensky to be regarded as “having an appearance of agnostic naturalism” by his contemporaries (Lossky 188). This very combination, however, existing in unusually equivalent proportions, presents an interesting case of rational intuitionism and opens many doors for future inquiry.

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