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TIME AND POLARITY
The Dimensional Thinking of Karl Heim

To be presented, with the permission of the Faculty of Theology of the University of Helsinki, for public examination in Porthania, hall IV, on October 21, 2000 at 10 AM.
Astonishing discoveries in the natural sciences are opening new paths of conversation among scientists, philosophers, and theologians. It has been recognized that each of their disciplines share a common basis: a desire to make sense of the unknown and the unknowable. Opposition and “creative dissonance” are changing into dialogue and consonance. On this common basis, it is possible to improve our understanding of reality, even though we can never fully resolve the whole mystery of reality in our quest.

Karl Heim (1874-1958) was one of the first theologians who deeply understood the necessity of a fundamental discussion among practitioners of science, philosophy, and theology. Heim argued that, first, we must construct an intelligible ontological, rather than epistemological, theory, although such a theory will have epistemological consequences. Heim’s dimensional doctrine was a coherent ontological theory of reality, a “theology of nature.”

The purpose of this doctoral dissertation is to analyze Karl Heim’s dimensional thinking in the context of philosophy, science, and theology. The main question is, is the “theology of nature”: a synthesis between the worldpicture of current natural sciences and the religious world-view possible on the ontological basis of Heim’s dimensional thinking? Two auxiliary questions are posed: What is the intension of Heim’s dimensional
thinking? And what is the extension of this thinking? The most important source of this dissertation is Heim’s six-volume work, *Der evangelische Glaube und das Denken der Gegenwart. Grundzüge einer christlichen Lebens-anschauung*, which was originally published between 1931-1952. The research method practiced here is a critical systematic analysis. Thus, my study is not comparative, even though I occasionally compare Heim’s thinking to other scholars’ arguments.

In order to provide a clear and systematic picture of Heim’s dimensional thinking, this study will proceed as follows: Chapter I presents a historical description of the evolution and philosophical battleground of his dimensional thinking. Chapter II provides an analysis of the basic concepts of his dimensional thinking. Chapter III analyzes and formalizes the intension of the dimensional thinking. The goal will be to answer the first question posed above. Chapter IV answers the second question. It is an analysis of the main contributions of Heim’s dimensional thinking to philosophy, science, and theology. The basic concepts of space, boundary, and polarity, with two-dimensional time as a general denominator of Heim’s dimensional thinking, have opened new perspectives for resolving such ultimate metaphysical questions as the controversy of idealism and realism, the problem of mind and body, the measurement problem of Quantum mechanics (QM), the problems of time, cosmology, and eschatology. This dissertation concludes with an estimation of the usefulness of Heim’s dimensional thinking for the discussion concerning ultimate questions related to a “Theory of Everything” (T.O.E).
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As a high school student, I had two earthshaking reading experiences. The first was Also sprach Zarathustra by Friedrich Nietzsche, and the second was Jesus der Weltvollender by Karl Heim. Both books were read in excellent Finnish translations. Without those two books, I would not have decided to start studying theology and philosophy.

Over thirty years ago the thesis for my Master’s and Licentiate degrees, Karl Heimin dimensio-oppi (The Dimensional Doctrine of Karl Heim), was evaluated by Professors Lars Haikola and Seppo A. Teinonen at the University of Helsinki. Haikola’s criticism arose from his phobia of metaphysics. He stated laconically: “It is difficult to evaluate this work, because it is related to too many sciences whose boundaries are undefined, and metaphysics is only a verbal game.” In his conclusion, Haikola recommended that it would be wiser to continue studying Heim’s thinking from the standpoint of the history of ideas. According to Teinonen’s evaluation, “the topic of this research is interesting and very little studied.” In his conclusion, Teinonen noted that Karl Heim’s dimensional doctrine and its philosophical problems were critically analyzed in my thesis for the first time. The Licentiate examination was held at Teinonen’s home, with Heikki Kirjavainen as the opponent. Almost all the scholars of that postgraduate seminar of Teinonen have received their Doctorates long ago. Now, finally, it is my turn.

I received the research topic from Professor Osmo Tiililä, who had been one of Heim’s postgraduates in Tübingen. After reading my Master’s thesis, Tiililä wrote a letter in which he advised me to continue my research and to find help from philosophers. However, he emphasized that it would be
wise to wait better times. When after over thirty years, I returned to this challenging topic, I did it thankfully to the above-mentioned teachers. Osmo Tiilikä’s recommendation to “wholehearted” pastoral work has guided me on a long journey on which preparing a doctoral dissertation was almost impossible, but on which my world-view has been widened. I have worked as a pastor in many parishes in Finland, as a missionary in Japan, and most recently as a pastor in the United States. During these thirty years, the scientific worldpicture has changed dramatically. Surely, it would have been easier to continue immediately my studies. On the other hand, now may be a better time to research this kind of topic than thirty years ago, because searching for a T.O.E. has become popular, the sciences are working ever closer with each other, and the puzzle-pieces are fitting together better and better, forming a clearer picture of reality.

I am grateful to Professor Eeva Martikainen who invited me to the project “Methodology of Modern Theology and the Change in Western Conception of Reality and History.” She has patiently guided me throughout the complicated process of doing research and arranging financial support for it. Many scholars have read drafts of my work and given me much appreciated advice and suggestions: Hans Schwarz (the University of Regensburg), Rainer E. Zimmermann (the University of Munich), Robert J. Russell (the Center for Theology and the Natural Sciences, Berkeley), Kari Enqvist and Heikki Kirjavainen (the University of Helsinki). Christopher Gardner (the John Hopkins University, Baltimore) and Eric J. Alava (science writer, Portland, Oregon) have improved my English in this endeavor. Special thanks belong to my wife, Michiyo. Without her patience and encouragement this dissertation would never have been finished. I dedicate this book to her with love.
INTRODUCTION

1. Research Problem

“If faith does not think, it is nothing.”
“If nobody asks me, I know what time is, but if I am asked then I am at a loss what to say.”

St. Augustine

Throughout the history of science, the “worldpicture”\(^1\) of physics has become more generalized.\(^2\) Nowadays, physicists are seeking the ultimate answer to the mystery of reality: a Theory of Everything (T.O.E.). If this “cosmic code” is discovered, it could reveal a strange realm of interdimensional wormholes and time warps. Such a theory would give us the ability to “read the mind of God,” as Cambridge cosmologist Stephen

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\(^1\) The concept “worldpicture” is strictly defined as the picture of reality in physics. The concept “world-view” is more comprehensive. Lars Haikola gave a useful definition of “world-view” in his essay, “Our need of a World-View. The Answer of Religion and Science,” in *Philosophical Studies in Religion, Metaphysics, and Ethics. Essays in Honour of Heikki Kirjavainen*, ed. Timo Koistinen and Tommi Lehtonen (Helsinki: Luther-Agricola-Society, 1997), pp. 60-76: “The world-view has one descriptive and one perspective aspect. It gives a description of reality in a general way. It gives a fundamental view of what is to be counted as real... It also includes fundamental moral convictions and other political and esthetical values and norms. The world-view is a pattern, a structure, of reality and life... It is not only a pattern for interpretation, but also a pattern for action.”

\(^2\) The first worldpictures were the cosmological theories of the ancient Greeks: Aristotle’s geocentric theory of spheres, Pythagoras’s heliocentric theory, and Ptolemy’s geocentric epicyclical model. Copernicus’s heliocentric model was a variation of these theories. These theories supposed that the stars and planets orbit in uniform circles. The next worldpictures were the cosmological theories of classical physics in the modern period: the cosmological theories of Kepler, Galileo, and Newton. According to these theories, the orbits of stars, planets, moons and comets are ellipses, parables or hyperbolas, and the law of universal gravitation prevails among them. Newton’s theory describes gravity in terms of force acting at a distance. It works well to explain our solar system, but it breaks down in strong gravitational fields. The next generation of worldpictures was the relativity theories of Einstein. According to his Special (SR) and General (GR) theories of relativity, the orbits of stars are open curves or orbiting ellipses. GR does not describe gravity as a mysterious mechanical force operating across distances but as a warping of space-time by mass and energy within it, as acceleration that depends on the curvature of space-time. Mass tells space-time how to curve, and space-time tells mass how to move. Objects try to move on straight lines, but their paths appear bent because space-time is curved. The next step was Quantum mechanics (QM), which is a worldpicture still under research. It describes phenomena at the atomic level and below, but not the substantial universe in any sense. Although contemporary physicists use “particle” language to describe the entities that they investigate, these entities themselves seem far from what is ordinarily called “bits” or “stuff.” At its most fundamental level, reality does not seem to be composed of stuff or things at all, but instead of dynamic relations. See, for example, Stephen Hawking, *The Illustrated A Brief History of Time* (New York: Bantam Books, 1996).
Hawking believes.\(^3\) There may be a fifty-fifty chance that someone will discover the “Holy Grail” of physics within the next twenty years. Then we could “play God”: master space and time, and create our future without limits.\(^4\)

On one side of the puzzle is Albert Einstein’s theory of GR. Einstein saw the large-scale universe as a smooth, curved surface in four dimensions, the three dimensions of space plus the dimension of time. The gravitational force that binds us to the earth arises from the very structure of that space-time continuum.\(^5\) On the other side of the puzzle is the theory of QM. Beginning in the 1920s, a generation of scientists defined the small-scale universe as a collection of fuzzy phantoms. These subatomic particles could not be precisely located in space-time, but their interaction could be described in statistical terms.\(^6\)

Both theories are proven successes in their fields, but taken together they are out of joint. The equations that explain gravitational fields are completely different from those used for electromagnetism and subatomic interactions. Moreover, each theory is incomplete by itself. GR cannot tell us how the Big Bang gave rise to the universe, as we know it, or what lies within black holes created by the collapse of massive stars. QM, meanwhile, only describes an assortment of particles, mathematical constants, and equations without divining the sense and symmetry underlying them all. For decades, theorists have tried various strategies to combine gravitational models and quantum models into one set of equations. All attempts have failed, even the most advanced form of QM, the so-called “Standard Model.” Whenever scientists tried to calculate the equations of these theories, they arrived at meaningless infinities.\(^7\)

The most promising candidates for a T.O.E. are the theories of Quantum gravity, which describe the real world in a philosophical sense: as the foundation of the modal

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\(^3\) Hawking, *A Brief History of Time*, p. 223, concludes: “…if we do discover a complete theory, it should in time be understandable in broad principle by everyone, not just a few scientists. Then we shall all…be able to take part in the discussion of the question of why it is that the universe and we exist. If we find the answer to that, it would be the ultimate triumph of human reason- for then we would know the mind of God.”


\(^7\) Hawking, *A Brief History of Time*, pp. 82-103.
world that we are able to perceive. Theoreticians have reproduced the ancient quest for finding the answer to a very old question that is intrinsic somehow in the very structure of consciousness. They ask: “What is the difference between a picture (or model, or metaphor) of the world and the world as object of which this picture is made by the process of mapping?” There are two competing theories of Quantum gravity: the theory of superstrings and loop quantum gravity.  

Since the early 1980s, Superstring Theory has gained popularity. Brian Greene and Michio Kaku have attempted to make it more understandable in several books. There is a growing acknowledgment among physicists worldwide that the universe may actually exist in a higher-dimensional space than is commonly recognized. Superstring theoreticians imagine the core components of the universe as strings or membranes vibrating in at least ten-dimensions. Different “eigenmodes” of the vibrations correspond to different types of particles. Thus, electrons, neutrinos, and other elementary particles fit on a grand cosmic scale. Superstring theoreticians say it should come as no surprise that the universe makes more sense in higher dimensions, because, for example, Einstein made the universe seem more sensible by including time as the fourth dimension. However, if the universe we only dimly understand as having four dimensions really has ten, where are the other six dimensions? The answer may be that when the Big Bang inflated our four dimensions into the universe as we know it the other six dimensions collapsed into loops smaller than the smallest observed subatomic particle.

There are millions of possible solutions for superstring equations, and figuring out the right solution for our universe would be like picking a needle out of a galaxy-sized haystack. Even if the theory turns out to be right, probing such shrunken dimensions would require energies approaching the scale of the Big Bang. However, outer space

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could open a window to the hidden dimensions and provide at least some confirmation of the superstring theory. By observing patterns of particles and antiparticles flying through space, researchers just might find indirect evidence to back up this particular T.O.E. Superstring theoreticians claim that the importance of the Superstring Theory lies in its power to unify all known physical phenomena: gravity, electromagnetism, and strong and weak nuclear forces.\footnote{Green, 	extit{The Elegant Universe}, pp.178-190. Alan Boyle, “Big Mystery: A Theory of Everything” in MSNBC: Mysteries of the Universe (http://www.msnbc.com/news, 1998).}

The second, quite similar, approach to find a T.O.E. is the so-called “Loop quantum gravity.” Loop theoreticians try to find a background free quantum theory with local degrees of freedom propagating causally. In the 1960s, John Wheeler argued that if it is not possible to unify GR and QM within the world, it might be possible to unify them outside the world. His basic idea was to introduce an abstract mathematical structure from which space and time (and matter) as fundamental categories of the world could be eventually derived. Thus, everything outside the world from which we might be able to derive these fundamental categories is the foundation of the world and as such it is a non-being. The idea is to visualize the world as a parallel variety that has become out of a primordial unity. Loop theoreticians argue that, in fact, GR and QM are not so different at all. The concepts of space and state turn out to be two aspects of a unified whole, likewise space-time and process or emergence.\footnote{Zimmermann, “Spinoza in Context,” in ICD, pp. 12-13.}

Even if a T.O.E. is found, one always can and will ask how we might know that quarks or even superstrings are not composed of still smaller entities \textit{ad infinitum}. How do we know that the visible universe is not just one of an infinite number of universes? Why such a world and not something else? No matter how far empirical science goes, our imagination can always go further. We are curious, and this trait has driven us continuously to seek and organize our understanding about reality. We have the inner need to find “the answer”: a comprehensive picture of this world, and our own place in it.\footnote{For example, Stanley L. Jaki, in his essays, 	extit{The Limits of a Limitless Science and Other Essays} (Wilmington, DE: ISI Books, 2000), argued that it is, in principle, impossible to find a T.O.E. as long as Kurt Gödel’s incompleteness theories are valid.}
A senior writer at *Scientific American*, John Horgan, argued in his provocative study *The End of Science* that science has given rise to a marvelous paradox. The same extraordinary progress that has led to predictions that we may soon know everything that can be known has also nurtured doubts that we cannot know anything. When one theory so rapidly succeeds another, how can we ever be sure that any theory is true? It seems that Charles Sanders Peirce, a founder of pragmatism, was right when he offered the definition of absolute truth: “It is whatever scientists say it is when they come to the end of their labors.”

However, can scientists really prove a theory through inductive reasoning, repeated empirical tests, or observations? Karl Popper asserted that observations can never prove a theory, but they can only disprove or falsify it. He denied that science could ever be reduced to a formal, logical system in which raw data is methodologically converted into truth. A scientific theory can be true, but we cannot know absolutely that it is true. There are questions beyond our cognitive abilities. Science could never answer questions about the meaning and purpose of the universe, for example, because its answers are only quantitative. Similarly, the lesson of QM is that nothing is completely determined, nothing is certain, and nothing is predictable. There are only propensities for things to occur. Science ultimately depends upon the illogical creative exercise of human imagination for its development of explanatory theories.

Thomas Kuhn, in his book on the philosophy of science, *The Structure of Scientific Revolutions*, argued, against Popper, that falsification is no more possible than verification. *A priori* paradigms (which are collections of procedures or ideas, what to believe and how to work) guide scientists. If a paradigm does not work, its anomalies may trigger a revolution, and the old paradigm is abandoned for a new one. Therefore, science is neither a continual building process, nor constantly approaching the truth. It does not evolve toward anything, but only away from something. In addition, says Kuhn, some day science could end. All scientific theories are, in the end, equally untrue.

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because we cannot discover the truth, we cannot find any final answer. For as long as Gödel’s incompleteness theorems are valid, the mathematical structure of that theory cannot contain within itself its own proof of consistency. We can never be sure that the assumptions with which we started are self-consistent or true. There will be things that we assume to be true but they cannot be proved.16

Such metaphysical questions as “Why is there a universe?” “Why is there something, rather than nothing?” or “Why such and not something else?” are as real, but as unresolved, today as they ever were. It is a task of philosophers and theologians to answer those ultimate metaphysical and cosmological questions, but they have left this task to the physicists, even if the metaphysical problems have no much or nothing to do with physics, as Aristotle, Descartes, and Kant, among others, have proved.17

In recent years, a desire to make sense out of the unknown and the unknowable has brought philosophers, scientists, and theologians closer to each other. Astonishing discoveries in the natural sciences, such as mentioned above, are cultivating fruitful soil for dialogue. It seems likely that the scientific community is moving to an era of radically new possibilities of dialogue and consonance.18 To assist such a task, a functional metaphysics, especially one focused on ontology, could help us toward a coherent vision of reality, as Ian G. Barbour has emphasized.19 The purpose of this dialogue cannot be an integration of science, philosophy, and theology. It is impossible because scientists can only measure physical aspect of reality and present generalized sets

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16 See Thomas Kuhn, The Structure of Scientific Revolutions (Chicago, IL: University of Chicago Press, 1962), and Horgan, The End of Science, pp. 41-48. Physicist Charles H. Townes believed in his “Logic and Uncertainties in Science and Religion,” in ST, pp.45-46, that “science must operate with the faith of reason that human logic can, in the long run, understand nature’s laws, and that these laws are consistent.” See also Paul Davies, “Is the Universe Absurd?” in ST, pp. 65-76.


of quantitative correlations about it, and what remains, that is, non-quantitative aspect of reality, is the field of philosophers and theologians. Freeman Dyson explained clearly this truth by arguing, “Science and religion are two windows that people look through, trying to understand the big universe outside, trying to understand why we are here. The two windows give different views, but they look out the same universe. Both views are one-sided, neither is complete. Both leave out essential features of the real world, and both are worthy of respect.” On this common basis, it may be possible to improve our understanding of reality, even if we cannot ever solve the whole mystery of the world, of our minds, and of God.

Karl Heim (1874-1958) realized that theologians have to look at reality also through the “window” of science. He saw that it was necessary to start a constructive dialogue and interaction among philosophers, scientists, and theologians. In order to relate theology with science and philosophy, Heim understood the necessity of a consistent and coherent, adequate and applicable epistemology, language, and methodology with which to relate such ultimate mysteries as the world, the mind, and God. To assist such a task, he constructed his ontological theory of reality: “theology of nature.”

23 Manfred Büttner, “Das physikotheologische System Karl Heims und seine Einordnung in die Geschichte der Beziehungen zwischen Theologie und Naturwissenschaften,” Kerygma und Dogma 4 (1973), pp. 267-268, argued that Heim’s thinking was “physico-theological.” So-called “physico-theology” began in the seventeenth century in the work of Voetius. It means there is some kind of synthesis between theology and science, whose aim is to ask about the possibility of God’s existence in the gaps of science. I argue that the term of “theology of nature” explains Heim’s purpose better than the term of “physico-theology” because Heim was neither a theologian interested in such “gaps” in science nor a natural theologian, but a theologian who wanted to show what is important for the relationship between science, philosophy, and theology in God’s reality. For example, Barbour in “Ways of Relating Science and Theology,” in PPT, pp. 41-45, and Ernan McMullin in “Natural Science and Belief in a Creator: Historical Notes,” in PPT, pp. 63-
Karl Heim was one of the first theologians in the twentieth century who tried to make the worldpicture of natural science consonant with a biblical christocentric-eschatological world-view. Such consonance was possible, he argued, by thinking “dimensionally.” Heim’s dimensional thinking was based on the concept of two-dimensional time, which was a theory he developed from 1902. According to Heim, time has not only a physical dimension but also an eternal dimension. From this revolutionary concept of two-dimensional time, with the subsequent additions of the “dimensional boundary” and “polarity” versus “supra-polarity,” came a remarkable solution to the ultimate questions about reality, as we shall see.

Heim described his life and thinking in his autobiography and some other memoirs. He believed that the living heritage of Schwabian pietism in his home most heavily influenced his thinking. When Heim was studying at the University of Tübingen (1892-96), Albert Ritschl’s theology dominated there, as in most European universities. According to Ritschl, whose theology was influenced by Immanuel Kant and Friedrich Schleiermacher, there are two kinds of sentences: statements of facts and judgments of value. Statements of facts present scientific facts, whereas judgments of value describe other things, such as theological matters. René Descartes had already divided reality into the realms of matter and of mind, and Kant had divided it into the realms of pure and practical reason, of knowledge and faith, of facts and values, of

25 Mystic, spiritual, and pansophic Schwabian Pietism arose in the seventeenth century from the thinking of Johann Valentin Andréaüs, and its adherents included Johan Albrecht Bengel, Friedrich Christoph Oetinger, Michael Hahn, Johann Tobias Beck, Ludwig Hofacker, Johann Christoph and Christoph Blumhard. The synthesis of Christology, cosmology, and eschatology in their thinking was the key to interpretation of revelation in the cosmic process of the universal history. The famous representatives of German speculative idealism, Schelling and Hegel, were also heirs of Schwabian Pietism. See Adolf Köberle, “Das schwäbisches-spekulative Erbe in der Theologie Karl Heims,” in Theologische Beiträge 5 (1974), pp. 14-24.
science and religion. Ritschl’s Kantian assumptions continued to separate science and theology completely for another century.  

As traveling secretary of the German Christian Student Federation, Heim participated in the international conference of Christian students held in Paris in 1900. The theme of his lecture was “Belief and Thinking” (Glaube und Denken), which later became the title of his opus magnum. Heim metaphorically compared the process of his thinking with a “river” that must break a “channel” through a “mountain,” that is, through God’s revelation and action in the world. The curves of the river can be understood only if we can know the form of the mountain. He argued that the “direction” of his thinking was determined by a passion to understand the mysterious existence into which we are thrown. This endeavor was neither some exercise in Christian apologetic nor missionary work to fill the “gaps” of science, as some critics of Heim have asserted. Heim thought, as Fichte, Schelling, and Hegel had thought about philosophy, that theology must elevate itself to the level of “science on everything” (Wissenschaft vom Ganzen). Heim’s aim was to resolve the problem of how we could reduce the chaotic plenitude of phenomena to the fewest, simplest, and most reliable singularities (Urgegebenheit), and describe reality in consonance with scientific facts based on those singularities. This kind of “theory of everything” was such an important goal to Heim that he did not fear the criticism to be expected from theologians who strictly separated science and theology, as Ritschl and Karl Barth did. A “worldpicture of the future,” a “theology of nature,” where the conscious minds “I” and “Thou” and the objective world “It” are in a coherent and inseparable relationship with “God,” was the purpose of Heim’s work.  

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26 Heim’s studies under such Ritschlian theologian as Theodor Haering played a secondary role in his development. Of much greater influence was the revolutionary religious awakening that took place in 1893. According to Heim’s *Ich gedenke*, pp. 31-36, “Es geschah gleich im Anfang meiner Studienzeit etwas, das von entscheidender Bedeutung für meine ganze Zukunft werden sollte, ein Ereignis, das stärker auf mich einwirkte als die glänzenden Vorlesungen unseres Philosophen Sigwart über Logik und Anthropologie… Dieses Ereignis bestand darin, daß zum erstenmal ein wirklich grosser und geistesmächtiger Evangelist, nämlich Elias Schrenk, in meinen Gesichtskreis trat… Es gab ein kurzes, aber befreiendes und erquickendes Gespräch, bei dem es zur bedingungslosen Kapitulation kam und damit zu dem radikalem Neuanfang… Das war der schöpferische Neubeginn meines inneren Lebens.”

27 Ibid., p. 56.

28 *GL*, pp. 11-26.
Karl Heim was both an intellectual and a “therapeutic” thinker in his journey to build interaction between science and theology. Among theologians of the twentieth century, he was years ahead his time. In the opinion of Hans-Rudolf Müller-Schwefe, Heim was a genius of the caliber of Max Planck and Albert Einstein. Quantum physicist Pascual Jordan honored Heim by arguing that Heim proved how it is possible to understand God’s existence, revelation, and action in our world within a scientific context.

2. Previous Research on Heim’s Work

Heim’s distinctive method, which he termed “thinking in spaces” (Denken in Räume), to build an intelligible and reliable ontology of reality consonant with theology, philosophy, and the natural sciences has been without equal among theologians on the first half of the twentieth century, but it has largely been abandoned after the rise of Karl Barth’s dialectical method of theology. Heim’s thinking has been subject of quite a few
books or essays. Strictly speaking, Heim’s main contribution to the discussion concerning the ultimate questions of reality, dimensional thinking, has not been critically researched at all. 33

There were only five dissertations on Heim’s work written before his death in 1958. These dissertations focused on the concept of the certainty of faith in Heim’s thinking. When these were written Heim’s dimensional thinking had not taken the final form it would have since 1934, when the revised Glaube und Denken was published at first time. Heim continuously reconstructed his thinking vis-à-vis the scientific discoveries of his time.

In his dissertation, Hans Joachim Iwand critically analyzed Heim’s concept of the certainty of faith. 34 According to Iwand, Heim tried to prove with the help of Kant’s antinomies that faith is the fundamental motif or cause of all human experiences. Iwand argued that it is impossible to combine Kant’s antinomies with any theological system, and that Heim’s logical and epistemological argument was a circulus vitiosus. 35

Wilhelm Heyderich compared the theological basis of Heim and F.H.R. Frank in his dissertation. 36 According to Heyderich, the certainty of faith is the most important theological basis for Heim and Frank, but their models of certainty and the positions of these models in theology differ radically. Frank’s certainty of faith is psychological,

33 There are monographs and essays on various aspects of Heim’s theology, such as: Walter Ruttenberg, Die apologetisch-theologische Methode Karl Heims (Leipzig-Erlangen: A. Deither’sche Verlagbuchhandlung, 1925), Heinz Erich Eisenhuth, Die Entwicklung des Problems der Glaubensgewißheit bei Karl Heim (Göttingen: Vandenhoeck & Ruprecht, 1928), Erdmann Schott, Das Problem der Glaubensgewißheit. In Auseinandersetzung mit Karl Heim erörtert (Greifswald: Verlag Ratsbuchhandlung, 1931), Edgar Leonhard Allen, A Guide to the Thoughts of Karl Heim. Jesus Our Leader (London: Hodder & Stoughton, 1948), Heinrich Schulte, Vom Weltbilde Karl Heims. Zu seinem Gesamtwerk “Der evangelische Glaube und das Denken der Gegenwart” (Stuttgart: Druckerei Körner, 1963), and Horst W. Beck, Götzendämmerung in der Wissenschaften. Karl Heim-Prophet und Pionier (Wuppertal: Verlag Rolf Brockhaus, 1974). The Karl-Heim-Archive is located at the Albrecht Bengel House in Tübingen. It holds the largest bibliographical collection of Heim and on Heim. Unfortunately, the manuscripts and correspondence of Karl Heim are missing. Of course, these are still not all the materials on Heim from universities around the world.


36 W. Heyderich, Die Bedeutung einer christlichen Gewißheitslehre für die systematische Theologie in Auseinandersetzung mit den von F.H.R. Frank und K. Heim vertretenen theologischen Grundpositionen (Göttingen: Leopold Klotz Verlag, 1934).
whereas Heim’s idea is ontological. When Heyderich wrote his dissertation, the first part of Heim’s main work had just been published in 1931. It included Heim’s early ideas about dimensional doctrine, but Heyderich did not analyze them.

The next dissertations on Heim, after a twenty years’ silence, argued over the contribution of Heim’s method to the apologetic discussion in the secular culture of the twentieth century. Carl Michalson, Francis Burger, and John Pemberton analyzed Heim’s thinking only from this point of view. Their descriptions of Heim’s dimensional thinking are correct, but they did not systematically analyze it.37

Hans Schwarz compared the understanding of miracles in the theologies of Heim and Rudolf Bultmann.38 According to Schwarz, both Heim’s and Bultmann’s intention was to help skeptical and disbelieving people to believe in God without any sacrifice of the intellect. To both men the ontology of Heidegger was important for analyzing human existence. For both of them, Christology was the center of dogmatic study. However, there was a fundamental difference in their thinking. Bultmann demythologized the biblical world-view, whereas Heim demythologized the “modern” world-views. As the three dissertations discussed above, Schwarz’s analysis of Heim’s dimensional thinking was incomplete.

James Cecil Logan examined the work of three twentieth century theologians: Karl Heim, Dietrich Bonhoeffer, and Friedrich Gogarten. Their major efforts were directed towards explaining the relationship of Christian theology with the secular stance of modern man.39 Logan’s examination is an analysis within the history of ideas, that of “salvation history.” The crisis of secularism for Heim was the crisis of transcendence, and his dimensional thinking became the foundation on which a new expression of transcendence could be predicated. In his response to Heim’s thinking, Logan argued that Heim’s world-view rests upon a type of inward and primal cognition of values and


38 Hans Schwarz, *Das Verständnis des Wunders bei Heim und Bultmann* (Stuttgart: Calver Verlag, 1966).

not upon scientifically verifiable facts. According to Logan, Heim’s confusion concerning his metaphysical basis is furthered by his failure to distinguish between the metaphysical and the epistemological intentions of statements. Logan’s analysis of Heim’s dimensional thinking is, however, extremely cursory, and thus his conclusion is a jump into a swamp.

Hermann Timm focused on the interaction between faith and the natural sciences in Heim’s theology. He thoroughly analyzed Heim’s thoughts concerning the crisis in the natural sciences, the concepts of time and space, and the problem of transcendence in secular culture. His description of Heim’s dimensional thinking was, alas, not at all systematic. There are also shortcomings concerning the origins of Heim’s thinking. Timm forgot the impact of at least Johann Gottlieb Fichte, Heinrich Rickert, Paul Natorp, and Edmund Husserl on Heim.

Timm concluded his work by claiming that Heim’s thoughts provide a possibility for Christians to understand and speak about faith and science without linguistic troubles. According to Timm, Heim’s dimensional thinking, where theology and science are complementary, has resolved the problems of time and transcendence. However, he did not realize that Heim’s concept of time is two-dimensional.

Dwight Calvert Steward compared the concept of space in the philosophies of Heim and Alfred North Whitehead. The focus of Steward’s dissertation was the philosophy of Whitehead. His analysis of Heim’s philosophy was only a point of reference. However, Heim’s system, according to Steward, corresponds better to science as currently practiced, because its concept of space is n-dimensional, whereas Whitehead’s metaphysical system was based on the Newtonian three-dimensional world.

Steward traced some interesting similarities and differences between Heim and Whitehead. A doctrine of panpsychism found in both men’s work constituted a rejection of materialism and positivism. The concepts of consciousness-spaces (Heim) and actual occasions (Whitehead) are quite similar. Both men spoke of the “in-flux” character of

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the present as contrasted with the settled character of the past. Heim’s portrayal of the
process of becoming was similar to Whitehead’s doctrine of “perishing.” Finally, both
men rejected solipsism, Heim as a realist and Whitehead as a critical idealist.

According to Steward, the most important difference between Heim and
Whitehead is their concept of the transcendence of God. According to Heim, it is “supra-
polar,” which means that the personal God is unchanged and independent from the world.
According to Whitehead, God’s transcendence is “bi-polar,” which means that the
apersonal God is continuously changing and that God requires the world. Moreover, man
is a co-creator of the universe with God. Whitehead’s metaphysical system is
teleological but not eschatological. According to Steward, the main reason for
differences between Heim and Whitehead was their basic philosophy: Whitehead, a
mathematician, was a Platonist, whereas Heim rejected Platonism in favor of realism.
Altogether, Steward’s analysis of Heim’s dimensional thinking was incomplete.
Therefore, he did not realize that Heim’s aim was to unify idealism and realism.

Ingemar Holmstrand analyzed critically the concept of the transcendence of God
in Heim’s thinking.\textsuperscript{42} He constructed some analytical concepts, such as “total view of
reality” and “basic assumption,” and four criteria, those of “universality,” “philosophy,”
“science,” and “existential criterion,” to judge the problem of transcendence in Heim’s
thinking. Unfortunately, Holmstrand’s analysis concerning Heim’s dimensional thinking
was misleading. Selecting only a few texts from Heim’s oeuvre for his analysis did not
do justice to Heim. Holmstrand’s arguments raised more questions than they gave
answers.

The most interesting point in Holmstrand’s dissertation was his comparison of
Heim with Thomas Kuhn’s theory of paradigms, as applied to religion, and with Thomas
F. Torrance’s theory of multileveled knowledge. Holmstrand argued that Heim’s
philosophy of spaces could be seen as a theory of paradigms in the same way as Kuhn
used the idea. Heim’s “supra-polar space” is an effort to construct an ultimate paradigm
that unifies everything and eliminates every anomaly. Holmstrand also argued that

\textsuperscript{42} Ingemar Holmstrand, \textit{Karl Heim on Philosophy, Science and the Transcendence of God} (Uppsala:
Almqvist & Wiksell, 1980).
Torrance’s notion of “levels of inquiry” is similar to Heim’s notion of space. Both are conceptual frameworks for ordering continuous reality.

Rolf Hille analyzed Heim’s apologetic and philosophical arguments toward idealistic philosophies and pantheistic religions. He produced a handbook on and about Heim, without which it would be much more difficult to research Heim. Roughly, the half of Hille’s book consists of an introduction and bibliographies, and only the remaining half contains any analysis. Although Hille agreed with Heim’s critics that the notion of dimensional thinking is an empty one, his work, nevertheless, discussed an important function of the dimensional doctrine in Heim’s thinking, namely, that it is a new method in the mission against all forms of absolutist world-views.

According to Hille, Heim argued that Christian theology is dualistic, yet its ontology is monistic, whereas both in pantheism and in idealism, theology is monistic and ontology is dualistic. However, Hille is incorrect with his assessment. Heim’s theology was also monistic, because between polar and supra-polar reality is continuity, not discontinuity, as we will see later. Hille has not noticed the continuity, because he did not analyze Heim’s dimensional thinking.

Elisabeth Gräb-Schmidt studied the certainty of faith in Heim’s epistemology, in the context of the philosophical influence of Edmund Husserl. According to her, Heim’s main concern was the unity of thinking and believing. The means to explore the unity demanded an exploration into philosophy, especially epistemology. In order to avoid conflict between thinking and believing, Heim argued against Kant’s idea of pure forms of intuition. Heim used the phenomenology of Husserl, but he misunderstood it in some crucial points. In the opinion of Gräb-Schmidt, Heim never was successful in his arguments against Kant. Instead, Heim developed his unique method, his “epistemology of faith,” on the ground of the concept of “non-objectifiable,” which is an absurd concept according to Husserl. Heim’s aim, according to Gräb-Schmidt, was to build an epistemological foundation of faith. His intellectual conscience could not rest before a

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solution was found to this problem. Either the epistemological conditions of reality were false or the Christian faith was an illusion. For Heim, knowledge is based on revelation, which means that faith and thinking belong together but faith goes before thinking. Therefore, Heim not only tried to justify faith with epistemology but also epistemology must be proven by faith, because believing and thinking (Glaube und Denken) belong inseparably together and are complement each other. Gräb-Schmidt asked: “Does Heim really want to think, or does he from the beginning want to prove possibility of faith?” Her dissertation is the critical analysis of Heim’s epistemology, and her criticism about Heim’s earlier works is as sharp as that found in Iwand’s thesis of 1924, but she was unaware what Iwand had said.

Toward the end of her analysis, Gräb-Schmidt made a brief reference to Heim’s dimensional thinking, but her question whether Heim’s dimensional thinking was epistemological (Erkennen) or only an emotional experience (Erlebnis) was not answered, because she did not analyze ontology of Heim’s dimensional thinking. She did not realize that Heim’s earlier thinking was also an endeavor, with the help of Husserl’s work, to construct an “ontological epistemology,” not just a “theological epistemology.”

Verena Grüter analyzed comparatively Heim’s Christology and eschatology in a theological and historical context. The development of Heim’s Christology and eschatology, and their position in the theological discussion are analyzed critically. However, Grüter did not analyze the role of dimensional thinking in Heim’s Christology or his eschatology. Therefore, she did not realize that Heim sought to provide clarity in theology with his dimensional perspective for those wrestling with theological questions, not to write an ecclesiastical dogmatics for theologians, as Karl Barth did.

Helmut Krause has written the most recent study on Heim. Krause studied the interdependence of theology, physics, and philosophy in Heim’s thinking. According to Krause, Heim battled with “twilight of the gods” of absolute space, time, object, and causal determinism in favor of faith in God. Heim proved how relative reality was

45 “Will Heim wirklich denken oder will er von Anfang an den Glauben als denkmöglich beweisen?” Ibid., p. 18.
47 Helmut Krause, Theologie, Physik und Philosophie im Weltbild Karl Heims. Das Absolute in Physik und Philosophie in theologischer Interpretation (Frankfurt am Main: Peter Lang, 1994).
constituted. He found a solution to the issues of subject-object, of monism-dualism, and of immanence-transcendence.

In the opinion of Krause, and many others, Heim’s concept of “supra-polar space” was a mistake because it meant that faith and thinking were no longer complementary but in conflict. Krause did not realize that in Heim’s dimensional thinking there is no discontinuity between polar and supra-polar reality. Regrettably, no scholar of Heim’s work has correctly understood his dimensional thinking, and especially his ingenious concepts of “two-dimensional time-space” and “supra-polar space.” The purpose of this dissertation is to fill this gap.

3. Research Method, Sources, and Literature

The purpose of this doctoral dissertation is to analyze Karl Heim’s dimensional thinking in the context of philosophy, science, and theology. The main question is, is the “theology of nature,” a synthesis of the current worldpicture of the natural sciences and a religious worldview, possible on the ontological basis of Heim’s dimensional thinking? Two auxiliary questions are posed: What is the intension of Heim’s dimensional thinking? And what is the extension of his dimensional thinking? The “intension” of a concept refers to the combination of qualities that is necessary for the application of that concept. The “extension” is the class of the objects to which the concept can be applicable. The meaning of “intension” in this dissertation is the structure of Heim’s dimensional thinking, which forms the ontological basis and language for the discussion among philosophers, scientists, and theologians. The meaning of “extension” in this dissertation is the contributions of Heim’s dimensional thinking to philosophy, to science, and to theology.48

48 According to Morris R. Cohen and Ernest Nagel, An Introduction to Logic and Scientific Method (London: Routledge & Kegan Paul, 1966), pp. 30-33, “intension” (connotation) and “extension” (denotation) are inseparable. There are three possibilities concerning “intension”: subjective, conventional, and objective. The subjective intension of term means the sum total of attributes that are present to the mind of any person employing the term. The conventional intension of term connotates the set of attributes those are essential to it. The objective intension or “comprehension” may signify all the attributes, which the objects in the denotation of a term have in common, whether these attributes are known, or not. See also Raili Kauppi, Einführung in die Theorie der Begriffssysteme. Acta Universitatis Tamperensis. Ser. A. Vol 15 (Tampere, 1967), pp. 12-18.
I have pursued a critical systematic analysis of Heim’s dimensional thinking by using the logical empirism practiced by the Vienna Circle as a point of reference (even if its arguments are commonly rejected nowadays), because it was a major current within philosophy in Heim’s lifetime, and because Heim’s attitude toward it was negative.\textsuperscript{49} The second, subsidiary, purpose of my dissertation is to present Heim’s dimensional thinking as a formalized appearance.

The most important source for this dissertation is Heim’s opus magnum, \textit{Der evangelische Glaube und das Denken der Gegenwart. Grundzüge einer christlichen Lebensanschauung}, which originally was published in six volumes between 1931 and 1952. To present a clear and systematic picture of Karl Heim’s dimensional thinking requires an outline of the evolution of his dimensional thinking,\textsuperscript{50} and a description of his philosophical battleground (Chapter I), a systematic analysis of the basic concepts of his dimensional thinking (Chapter II), and a systematic analysis of the intension of his dimensional thinking (Chapter III). One can then suggest an answer to the question concerning the intension of Heim’s dimensional thinking posed above. Finally, the answer to the question concerning the extension of Heim’s dimensional thinking requires an analysis of its contributions to philosophy, to science, and to theology. Although the intension of the dimensional thinking is concerning with ontology, its extension is focused on epistemology (Chapter IV). I conclude my study by estimating the usefulness of Heim’s dimensional thinking for the discussion about the ultimate questions related to a T.O.E.

While the focus of this dissertation is on the six volumes of Heim’s main work, an insufficient analysis of his dimensional thinking would result, if one did not consider all of Heim’s oeuvre. Moreover, although my study is not comparative, it is impossible to avoid a critical comparison among Heim, his critics, and other scholars.


\textsuperscript{50}The analysis of roots of Heim’s thinking is only indirect, because Heim’s whole library was sold and dispensed, soon after his death. In addition, Heim’s correspondence with such thinkers as Einstein is missing, and Heim seldom used bibliographical footnotes in his work. However, for example, the name index of his main work includes 367 names. Heim referred mostly to Fichte, Einstein, Hegel, Heidegger, Heisenberg, Jordan, Kant, Luther, Newton, Planck, Reichenbach, and Schelling.
Chapter I

AN OUTLINE OF HEIM’S DIMENSIONAL THINKING

1. Evolution of Heim’s Dimensional Thinking

There seem to have been four periods in Heim’s thinking. The first one ended around 1906, the second one in 1920, the third one in 1928, and fourth one lasted until his death in 1958. During each period, Heim’s thinking changed as he confronted with scientific discoveries and philosophical ideas of the day. He was not interested in traditional theology, but he wanted to construct a modern “theology of nature” in which believing and thinking worked in consonance with philosophy and science.¹

A. The first period (1899-1906): Heim’s Decision-category

Heim started his academic career by studying the epistemology and logic of Thomas Hobbes, who was perhaps the most well known materialist and nominalist of the seventeenth century.² Hobbes rejected free will in favor of determinism, and he rejected both Aristotelian and scholastic philosophy in favor of the philosophy of Galileo, which largely treated the cosmos as matter in motion. The motion of bodies was the basis of Hobbes’ metaphysics. For example, there are two kinds of bodies ruled by the fundamental principle of motion: natural bodies of the physical world and artificial bodies, or social groups, culminating in “the state.” Man moves in both of them. The mind is a link between natural and artificial bodies. Hobbes abandoned the obscurantism and dualism of Descartes and other rationalists, and he applied the new mathematical and mechanical principles of Galileo to the mind as well as matter. He thus established a mechanical empiricism in which thinking becomes arithmetic. Hobbes also imposed severe limitations on philosophical knowledge. He argued that we would never be able

¹ It is impossible to say exactly when one period ends and another one begins. I have supposed that changes in Heim’s thinking became visible in the fully revised editions of his works, and the publishing years serve as rough boundaries.
² Unfortunately Heim’s unpublished dissertation, Die Grundzüge der Erkenntnistheorie und Logik von Hobbes (University of Tübingen, 1899), is lost. Heim subsequently referred to it only in passing.
to know completely the external world. It may be real, but if so, we cannot detect or prove its reality. What we know about the world is the result of stimuli coming from the motions of the external world and acting upon the substance of our brains. The resulting sense perceptions are all that we can be conscious of, and they reveal only our reactions to external stimuli, not the external world as it really is. ³

Like Hobbes, Heim held a negative position toward Cartesian dualism. Descartes had argued that the human body was a machine, and subject to the same mechanical laws of nature as a machine. The mind, however, as an essence of the human being, was a non-material entity. Therefore, causal laws did not govern it. Because human beings were thought to be essentially non-material and spiritual beings, they could not be subjects of inquiry for a philosopher of nature. Hobbes had rejected this conception, but Heim argued that there is an inseparable relationship between mind and body. Epistemologically, knowledge depended on the relation between mind and body. Like Hobbes, Heim was interested in the physiology of the knowledge process. His aim, like that of Hobbes, was not to discover a soul or spirit in the brain, and thus renounce all speculations of faith, but to seek every possible connection between mind and body for the certainty of faith. ⁴

In his first, and I think most suggestive publication, Psychologismus oder Antipsychologismus. Entwurf einer erkenntnistheoretischen Fundamentierung der modernen Energetik (PA), ⁵ Heim tried to construct a new world-view from Kant’s epistemology ⁶ using Husserl’s phenomenology, ⁷ and both Wilhelm Ostwald’s and John Bernard Stallo’s “modern energetics.” ⁸ The basic idea of Heim’s book was that Kant’s argument concerning “true knowledge” is possible only intuitively. Kant believed that the elevation of metaphysics to the status of a science requires that metaphysics must be

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⁴ Krause, Theologie, Physik und Philosophie, pp. 11-14.
⁵ Berlin: C.A. Schwetschke und Sohn, 1902.
⁷ Edmund Husserl (1859-1938) had written his books Logische Untersuchungen I-II (1900-01), in English: Logical Investigations (1970), in Halle where Heim also then lived.
⁸ Physicist and philosopher Wilhelm Ostwald (1853-1932) was monist, anti-materialist, and anti-atomist. John Bernard Stallo (1823-1900) was a Hegelian idealist.
founded upon *a priori* knowledge. All attempts to establish an *a priori* base for the knowledge of things fail so long as we assume that our knowledge must conform to things. What we can know about objects *a priori* is limited to that which “we ourselves put into those objects.”

Husserl argued that phenomenology must begin with the study of human consciousness, with *ego cogito* rather than nature, and take up the standpoint of “transcendental subjectivity.” It was an attempt to define the “structures” that are essential to any and every possible experience. Thus, Husserl’s phenomenology was ultimately a search for “foundations.”

Like Husserl, Heim attacked psychologism and naturalism, because necessary truths are neither psychological nor empirical truths. Husserl also had rejected Gottlob Frege’s argument that necessary truths are conventional truths. What makes necessary truths true, according to Husserl, is the very structure of human consciousness and a peculiar class of objects called “essences,” which are not to be discovered psychologically, syntactically, or semantically, but phenomenologically. Because Husserl’s phenomenology denies the existence of any external reality, it is solipsistic. Heim rejected solipsism. Nevertheless, he did embrace Husserl’s phenomenological method, which was important for his later dimensional thinking.

From the beginning of his work, Heim believed that space and time belonged inseparably together. This unity played an important role for outlining a new world-view that was no longer dependent on Newtonian concepts of absolute space and absolute time. In place of it, he tried to construct a new, physically energetic and philosophically phenomenological world-view based on the relativity of space-time. He argued that his philosophy is a philosophy of relations. Therefore, the principle of relativity was the basis of his world-view even before Albert Einstein’s formulation of SR. He justified it with a relational epistemology: knowledge was the understanding of relations. Heim

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9 Kant, B xvi-xvii.
12 PA, pp. 77-100.
13 Einstein spoke “space-time” in 1905. Heim had used the term of “time-space” since 1902.
argued that perception is impossible without a relationship of physical and phenomenal time.\textsuperscript{14}

“Time” in his space-time relationship is more important than “space.” Therefore, he preferred to explain the relationship of space and time as “time-space.” Time and its contents form a relational unity.\textsuperscript{15} Time-space was not only an \textit{a priori} form of intuition, as Kant had thought it is. Time-space is perspectival, relative, and an infinite reality.\textsuperscript{16} Like Leibniz, Heim argued that there is no fixed and motionless point in infinite space, but space is always in relative motion. From the perspective of possibility, the continuum of time-space is volitional, and from the perspective of actuality, it is energetic. Therefore, the continuum of time-space is, from the viewpoint of epistemology, decisional. According to Heim’s “decision-category,” the number or sum of real decisions is constantly one, while the number or sum of possible decisions is constantly infinite because energy is constant.\textsuperscript{17}

Heim had realized that an irrationality was within physical time, because at the “now” point, the past and the future, cause and effect, seemed to be simultaneous possibilities. As a solution to this antinomy, Heim argued that time must be two-dimensional, and reality is then a five-dimensional world of consciousness or experience (\textit{Bewusstsein oder Erlebnis}).\textsuperscript{18} Heim’s concept concerning time was breaking a new path, which, almost a century later, is now playing a crucial role in the Superstring Theory. Regrettably, Heim did not explain clearly his revolutionary idea and its consequences in \textit{PA}. He subsequently changed his ideas to agree with Kant, that time is somehow “supra-

\textsuperscript{14} \textit{PA}, pp. 69-71. “Ein Erkennen von Relationen ist. Es müssen also die Sätze gelten: Jeder Inhalt ist eine Relation relativ zu den Inhalten betrachtet, deren Beziehung auf einander er in sich darstellt. Und jede Relation ist ein Inhalt relativ zu den nächst höheren Relationen, in denen sie selbst wieder zu anderen Inhalten bzw. Relationen steht.”

\textsuperscript{15} \textit{PA}, pp.72-77. “Der Jetztpunkt ist nicht anders als die Unterscheidung von Inhalten, die in derselben als vergangene und zukünftige Inhalte auseinandertreten.” Heim argued that within consciousness logical principles are without time limits, thus supra-temporal. Heim, “Selbstanzeige,” pp.124-125.

\textsuperscript{16} \textit{PA}, p. 113. Heim had not recognized that the laws of thermodynamics deny infinite time and space.

\textsuperscript{17} \textit{PA}, pp. 122-134.

\textsuperscript{18} \textit{PA}, pp. 142. David Hume in his book \textit{A Treatise of Human Nature} (Book I, Part III, Sections ii and xiv, 1739), rejected the proposition that cause and effect could be simultaneous: “For if one cause were co-temporary with its effect, and this effect with its effect, and so on, ‘tis plain there wou’d be no such thing as succession, and all objects must be co-existent.” Therefore, physical time can be only one-dimensional. Heim made the right conclusion about the irrationality of time, but he did not yet realize that cause always happens at the eternal now-point, and effect appears always in the past. In other words, cause belongs to the dimension of eternal time, and effect to the dimension of physical time.
empirical,” and as such, a mathematical, logical, and an *a priori* form of intuition.\textsuperscript{19} Later his concept of two-dimensional time became the foundation of his dimensional doctrine and his main contribution to philosophy, science, and theology, as we will see.

On the other hand, Heim’s concept of space was consistently empirical, for geometry was an empirical science, not only rational, as Kant had thought. Heim also argued that the logical principles within consciousness are without time limits, thus supra temporal. Like Leibniz, Heim believed that it would be theoretically possible to calculate all possible experiences. According to Heim, this calculation is possible in a five-dimensional continuum of time-space.\textsuperscript{20}

Heim’s first attempt to construct the outline of a modern world-view did not receive much attention. However, from PA began a line of thought that continued through the rest of Heim’s work, and it is important for understanding his later, dimensional, thinking. More comprehensive was the next book, *Das Weltbild der Zukunft. Eine Auseinandersetzung zwischen Philosophie, Naturwissenschaft und Theologie* (WZ),\textsuperscript{21} in which Heim reconsidered certain old and unsolved metaphysical questions. He hoped that this book would help him receive a university appointment, but such was not the case. Students liked it, but the scientific community rejected it with shrugs.\textsuperscript{22}

The point of departure in Heim’s endeavor was an attempt to clarify Kant’s epistemology by using the work of such Neo-Kantians as Riehl and Natorp.\textsuperscript{23} The possibility of knowledge is not only dependent on what we put into objects, but also what objects are put into our minds. Kant had decided that neither the forms of space and time (his sensible concepts) nor the categories of causality and substance (his intellectual

\textsuperscript{19} Heim, “Selbstanzeige,” pp. 124-125. “Da nun nach unserer Raum- und Zeittheorie die *zweidimensionale Zeit* und der *dreidimensionale Raum* nur empirisch vorgefundene Beschränkungen der an sich unendlichen Dimensionsmöglichkeit des Bewusstseins sind, so darf der logische Dingbegriff nicht mit der empirischen Zeit- oder Raumanschauung verquickt werden, sondern muss an einem *überempirischen Zeitbegriff* orientiert sein… (italics mine).”

\textsuperscript{20} PA, p. 100.


\textsuperscript{22} “Wenn ich überhaupt vorwärtskommen wolle, so hätte ich das nicht dümmer anfangen können…Viel besser wäre es gewesen, zunächst einmal durch eine kleine historische Untersuchung zu beweisen, daß ich überhaupt instande sei, exakte historische Quellenarbeit zu treiben.” Heim, *Ich gedenke*, p. 76.

\textsuperscript{23} Heim often referred to Riehl’s *Zur Einführung in die Philosophie der Gegenwart* and Natorp’s *Platos Ideenlehre*. About interpretations of ideas in these books, see Cassirer, *Phenomenology of Knowledge*, pp. 51-57, 203.
concepts) applied to objective reality, that is, to the things-in-themselves. For Heim the concept of relation was so essential to consciousness that all genuine consciousness is relational. He argued that the contradiction between mind and reality, perception and existence, could be eliminated, but the elimination of those contradictions demanded a radical crossing of Kant’s “transcendental horizon,” that is, the limits of human knowledge to know anything about so-called noumena. The solution was in the either-or relations of consciousness (Bewusstseinswirklichkeit). Heim agreed with Leibniz that it is impossible simultaneously to determine the opposite directions of over or under, right or left, forward or backward, motion or rest. If there were only one being in space, we could not know whether it is moving or resting, because there is no absolute rest point. Therefore, space-time must be relative and proportional.

According to Heim, there are three different epistemological relations: a basic relation (Grundverhältnis) between unity and proportion, a relation between proportions (Proportionsverhältnis), and an alternative or exchange relation (Umtauschverhältnis). There are also higher and lower unities and proportions, which are arithmetical relations within the epistemological relations. Between relations, there are boundaries that separate, for example, form and its contents. The relation of proportions is “hard,” and both basic and alternative relations are “living” or “soft” relations. The relation of proportions explains the causal-mechanic reality, and the other relations, the organic reality.24

John Bernard Stallo, a Hegelian idealist, had claimed that Giordano Bruno’s idea of an infinite reality “is the background of all material actions and forms; no system of elements or forces can exist without it, or is cognizable without reference to it; and in this sense, and in this sense only, the universe is necessarily infinite in mass as well as in space and time.” Heim agreed with Stallo that reality is infinite rather than finite.25

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24 WZ, pp. 34-36. “Haben aber hiernach alle unsere räumlichen und zeitlichen Maße den Charakter von Verhältnissen oder Proportionen, die sich gleichbleiben, wenn man ihre Glieder mit denselben Zahlen multipliziert oder dividiert, so wird damit unsere ganze Naturwissenschaft zu einer Wissenschaft von Verhältnissen.” In GL, p. 26, Heim’s arguments about relations were based on the psychophysical law of Ernst Heinrich Weber (1795-1878) and Gustav Theodor Fechner (1801-87): \( d\gamma = k \frac{d\beta}{\beta} \), where \( \gamma \) is a quantity of emotion, \( \beta \) a quantity of stimulus, and \( k \) is constant. Heim said that Fechner also influenced his arguments in other books.

Heim’s continuum of time was a dynamic and infinite relation with double alternatives, where the present is the eternally permanent and constant duration (or point) between past and future. Both future and past are transformed into a unity in the present. Time has also a certain simultaneous content and form: the basic relation of unity and proportion. The continuum of space is an alternative relation. If in one point of time, there is always only one relation but many proportional contents simultaneously real, then it is possible to experience these contents separately.  

By studying colored surfaces and optical phenomena, Heim argued that the pure time duration is originated by the “first grade” of the alternative relation, and the spatial surface by the “second grade” of the alternative relation. Space itself is second grade time, which means, two time-lines becomes one space-line. When the space-lines are restored to the pure time-line, we can experience the depth-dimension. Heim thought that the full explanation of the space of colors needs at least a four-dimensional perspective.

George Berkeley, an empiricist, had summoned inner experience to battle against outward experience, psychology against physics, especially against the foundations of Newton’s mathematics and his theory of motion. Nevertheless, nineteenth-century physics underwent a strange shift in the field of epistemology. Ernst Mach used Berkeley’s theory of knowledge in his physics and psychology. In his analysis of sensation, Mach expressly stated that the central methodological purpose of his theory was to eliminate the arbitrary distinctions between inner and outward experience, that is, between psychology and physics. Heim’s purpose was similar, but he rejected Mach’s positivism.

The most important problem for Heim was, what is the relation between consciousness and reality, are they identical or separated? If they are identical, solipsism cannot be avoided. Heim had already battled against solipsism in *PA*, concluding that reality and consciousness cannot be identical. The only possibility was that these must be

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27 *WZ*, pp. 59-89. Heim’s thought that space is the “second grade time,” is, in fact, similar with Einstein’s space-time concept. According to Einstein, it is incorrect to speak about time and space. We must speak only about space-time. Heim’s conception was time-space, which means, that time is more important than space in this relation.
in a relationship. Reality is both “become” (Geworden) and “becoming” (Werden) by decisions of energetic wills, “Thou” or “I,” between which is the alternative relation. Both “Thou” and “I” are the centers of the perspectival world. From that situation follows the decision of will: either-or. The continuum of time-space is the battleground of wills. The purpose in the battle of wills is the will from disunity to unity, where “soul is the universe,” as WZ argued. However, it is necessary that there is also chaos because the cosmos originated from chaos. If reality could be explained wholly, it would be absolute nothingness, as is thought in Japanese Buddhism. The same move from disunity to unity is also evident in the battles between determinism and indeterminism, and between matter and energy. The last unity is possible only in the transcendent Oneness, which is divine reality (Raum) and the origin of all.

In his earliest period of thought, Heim tried to construct a world-view that was based on epistemology. He started with the materialistic epistemology of Hobbes, continued through the phenomenological epistemology of Husserl to the transcendental epistemology of Neo-Kantianism, the positivistic or physiological epistemology of Mach’s and Avenarius’ empirism, and through the energetic epistemology of Stallo’s and Ostwald’s Hegelian idealism. Heim’s purpose was to clear Kant’s transcendental epistemology of its fatal flaws. The fundamental category in the structure of his world-view was the epistemological “decision,” which means that the energetic and volitional aspect of the mind has the priority within the human actions. During his second period, Heim focused on ontology rather than epistemology, which meant that he had to cross Kant’s transcendental horizon. Heim’s world-view was then monistic, psychophysical,

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28 Heim quoted books of Richard Avenarius, Kritik der reinen Erfahrung and Der menschliche Weltbegriff, and Ernst Mach, Analyse der Empfindungen, and he argued that these books eliminated the “I-myth” of German absolute idealism and made possible the modern research methods of science.
29 Arthur Schopenhauer had thought that a universal will is the primary reality, and the individual’s will forms part of it. In his view, the will dominates every aspect of an individual’s personality, knowledge, feelings, and directions in life. Heim’s thought was similar, but he did not mention Schopenhauer in his book.
30 Japanese Buddhism influenced Heim’s thinking, as could be seen in many pages in WZ and, for example, in his essay, “Der Zen-Buddhismus in Japan,” in GL, pp.144-159.
indeterministic, energetic, and religious. Heim believed that his new vision of the cosmos harmonized such opposites as: dualism and monism, science and religion.\textsuperscript{32}

\textbf{B. The second period (1906-1920): Heim’s Destiny-category}

After this exceptional start of his academic career as a theologian, Heim followed the advice of his advisors, such as Friedrich Loofs, and turned to traditional historical studies. Loofs advised him to study pre-Thomist scholasticism. Heim analyzed the concept of grace and its relation to the natural functions of human beings by Alexander Halesius. This was a preliminary exercise for his historical analysis of the concept of the certainty of faith used in systematic theology until Schleiermacher.\textsuperscript{33} The problem of the certainty of faith became the main theme of Heim’s thinking in his second and third periods. Methodologically these studies were important for Heim’s later development as a philosopher. Heim said in his autobiography that the scholastic method of Halesius was a good foundation for his later thinking.\textsuperscript{34}

Even though he did not hold a position at a theological school, Heim was allowed to assume duties as a private docent in the department of systematic theology at the University of Halle in 1907,\textsuperscript{35} and in 1914, Heim was invited to be professor (\textit{Ordinarius}) of systematic theology at the University of Münster. Because of World War I, Heim did not start teaching until 1918. During the war, he was developing his world-view, which sought to justify the certainty of faith. Heim considered his book, \textit{Glaubensgewißheit. Eine Untersuchung über die Lebensfrage der Religion (GG)}, the main work of his second period.\textsuperscript{36} The world-view of the certainty of faith followed the arguments of his earlier thinking: relational reality had a decision-making characteristic. However, because the

\textsuperscript{33} Karl Heim, \textit{Das Wesen der Gnade und ihr Verhältnis zu den natürlichen Funktionen des Menschen bei Alexander Halesius. Die Lehre von der gratia gratis data nach Alexander Halesius} (Leipzig, 1907), and \textit{Das Gewißheitsproblem in der systematischen Theologie bis zu Schleiermacher} (Leipzig, 1911).
\textsuperscript{34} Heim, \textit{Ich gedenke}, pp. 78-79.
\textsuperscript{35} According to Martin Thust, “Christliche Revolution in der Wissenschaft, Karl Heim 75 Jahre alt,” in \textit{Zeitwende} 20 (1948-49), p. 523, there were in Halle in 1910s, “Drei ein wenig verrückte Akademiker, über die man den Kopf schüttelte”: the mathematician Moritz Cantor, the philosopher Edmund Husserl and Karl Heim.
“decision”-category was too narrow and insufficient to justify the certainty of faith, Heim borrowed the “destiny”-category (Schicksal) from Oswald Spengler.37 This category allowed for greater emphasis on God’s continuing activity in the world than had the category of “decision.” Spengler had formulated a speculative philosophy of history that explained the whole history of human culture. He attempted to suggest that each individual culture possesses a unique soul or style of art and thought, and that all cultures pass through an irreversible life cycle of growth and decay that is comparable to the biological cycle of living organisms. According to Heim, Spengler tried to release the science of history from the random ways of human decisions. Spengler’s world-view of destiny unfolded a new organic, supra-personal, absolute, and immortal interior of reality, which was the opposite of the relative, causal-mechanic, and physicalistic world-view of physics. Heim rejected Spengler’s ideas as inadequate. The destiny-category meant to Heim that ego as a perspectival center of reality could consider its own personal destiny in the flux of space-time as either external chance or internal necessity. My personal destiny is the irreversibility of time and the non-exchangeability of it. Thus, a new question was asked: how it is possible to decide the issue of external contingency or internal determinism? According to Heim, neither human experience and scientific measurement nor pure intuitive thinking was capable of resolving it. Therefore, it was necessary to find another solution for this problem that was both epistemological and ontological. Hans Vaihinger’s fictionalism (Philosophie des Als-Ob) seemed to be a possibility, but Heim rejected it as too easy a solution.38 According to Vaihinger, there are only fictions and illusions: space and time as infinities, necessity and possibility as abstractions, and subject and object as primordial illusions. Fictionalism, in which even the concept of fiction was untrue, could not be the necessity of reason in a Kantian sense or the real structure of reality. It could not be any solution for the dilemma of our destiny and of faith’s certainty.

Inspired by Einstein’s SR, Heim analyzed how the absolutes of space and time have changed from Copernicus and Kepler to Einstein. On the one hand, Copernicus’s

heliocentric system had made relative Ptolemy’s geocentric worldpicture with the center position of human soul in space, Darwinian evolution took away the center position of human soul in time, and physiology undermined the meaning of human soul in nature. Thinking and willing consciousness had changed to a pure chemical process. Heim asked, did such an understanding not mean the end of religion? However, there were opposite speculations such as the theosophical system of Paracelsus who had speculated that nature was the incarnation of God, and God itself was soul in this body of nature. Kepler believed in animate stars, and Jacob Böhme dreamed in his natural philosophy that there are no transcendent heaven and hell but rather they are supra-spatial spaces of the soul. Schelling thought that reality was theosophical and polar, and Gustaf Theodor Fechner argued in favor of space of consciousness in which the whole nature from the inorganic atoms was constructed from animate circles. The physical cosmos was changed to the religious and mythological world. Heim rejected all these speculations and argued that speculative natural philosophy was not an adequate conception of reality. Heim’s vision was a "theology of nature," that was a synthesis of the worldpicture of modern science and world-views of philosophy and theology. Heim argued that the theologians must follow the developments of science and of philosophy.

Although Heim shifted his interest from epistemology to ontology in his second period, his concept of time-space developed not only ontologically, but also epistemologically. An interesting endeavor was Heim’s analysis of Neo-Platonic and Aristotelian dualisms. According to Heim, neo-Platonic dualism was one-dimensional: subject and object belong together, and Aristotelian dualism was two-dimensional: subject and object are opposite. Heim argued that reality was a monistic relation, in which transcendence and immanence are inverted. Heim argued based on Kant’s space-time antinomies that the past, future, and present within the continuum of time are a unity

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39 Heim was influenced by Jakob Böhme’s conception of ultimate reality as a coincidence of opposites, as also was Paul Tillich, who developed from it the notion of the multi-dimensional unity of all things. The first dimension was the primal, non-rational dimension, which was both a creative and demonic reality at the same time. The second dimension was ontological and a dialectical kind of rational reality. The third dimension was ontic and a scientific kind of rational reality. About Böhme and Tillich, see Roy D. Morrison, II, Science, Theology and the Transcendental Horizon. Einstein, Kant and Tillich (Atlanta, GA: Scholars Press, 1994), pp. 141-142.

40 Heim, "Der Gegenwärtige Stand der Debatte zwischen Theologie und Naturwissenschaft" (1908) in GL, pp. 39-68.
in the eternal consciousness, *solinuncism*. On the other hand, perception of space is paradoxal: either-or and both-and are simultaneous.\(^{41}\)

For Heim, time-space was relative, as Einstein had proved. The continuum of time was irreversible, and the destiny of the “I”-space was not an alternative. The disjunction dominates in logic, and the conjunction in reality. They both are unified irrationally in a double way. Heim believed that this thought could resolve all paradoxes of space and time.

C. The third period (1920-1928): Heim’s Non-objectifiable- and Perspective-categories

In 1920, Heim was invited to be the professor of systematic theology at the University of Tübingen, as a successor to his own teacher, Theodor Haering. In 1922, he traveled to China for an international conference of Christian students, and from there, he traveled through Japan and the United States back to Germany. The journey apparently had a great influence on him. Although Heim rejected the pantheism of eastern philosophies, its influence could be seen in his thought. One of the basic concepts in his dimensional thinking would be the “Yin-Yang” of Taoism, namely, “polarity.”\(^{42}\)

After Einstein had formulated his GR, Heim considered it in his essay *Gedanken eines Theologen zu Einsteins Relativitätstheorie* (1921).\(^{43}\) Heim’s question was: Are the theories of relativity only applicable in the territory of physics, but not those of philosophy or of theology? What is the essence or purpose of these theories? Heim argued that Einstein’s theories have changed the assumptions of all sciences, including philosophy and theology. It is impossible to study theology without knowing the consequences of Einstein’s theories of relativity. Heim argued that the epistemological subject as a perspectival center has become more important in Einstein’s space-time than

\(^{41}\) See Ruttenbeck, *Die apologetisch-theologische Methode Karl Heims*, pp. 47-54.

\(^{42}\) See Heim, *Ich gedenke*, pp. 104-162, and “Der Zen-Buddhismus in Japan,” (1923) in *GL*, pp. 144 -159. “Polarity” was one of the central concepts in the transcendental idealism of Schelling, whose influence on Heim was notable, for he referred to it as early as 1908. See F.W.J. Schelling, *System of Transcendental Idealism* (1800), trans. Peter Heath with an Introduction by Michael Vater (Charlottesville, VA: University Press of Virginia, 1997).

\(^{43}\) *GL*, pp. 125-143.
it had been in Newton’s absolute space and absolute time. The “knowing I” is in an inseparable relation with reality. In addition, if it is so that the “knowing I” is in a relation with reality, then so too are the “willing I” and the “evaluating I.” Because SR displaced the notion of an absolute objectivity, reality must be not only physical but also psychic or spiritual. However, there is no neutral and absolute perspective in our relative reality. The only possible absolute center must be a theocentric space beyond relative and polar reality.

The main result in the third period of Heim’s intellectual history was the fully revised third edition of *GG*. In this book, Heim’s time-space concept crystallized. There are two opposite worldpictures of physics: a causal-mechanic worldpicture, where time is without a now-point and space without a here-point, and a dynamic and phenomenal worldpicture, where time has a now-point and space has a here-point in the perspectival center of non-objectifiable “I.” Heim borrowed the concept of “non-objectifiable” (nichtgegenständlich) from Heinrich Rickert, who was a Neo-Kantian philosopher. This concept became fundamental to Heim’s dimensional thinking. It opened a new “dimension,” the unseen reality beyond the objectifiable world. However, Heim’s world-view did not change to one of Cartesian dualism. It remained monistic, because he argued that there could not be two layers in reality: material and spiritual. Reality is one relational unit, as Einstein had argued in his theories of relativity. Heim outlined a scheme in which the world of objects is formed perspectival around the non-objectifiable center. Non-objectifiable reality is neither spatial nor temporal. It is theologically the most real, always present, eternal, and transperspectival space of God.

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44 Leipzig, 1923.
45 Heinrich Rickert (1863-1936) completed his habilitation work in 1891, *Der Gegenstand der Erkenntnis*, which was a general introduction to the problems of epistemology from a Neo-Kantian perspective. According to Rickert, there are three kinds of subjects: psycho-physic, psychic, and epistemological. See Guy Oakes, “Introduction: Rickert’s Theory of Historical Knowledge,” in H. Rickert, *The Limits of Concept Formation in Natural Science. A Logical Introduction to the Historical Sciences*, ed. and trans. Guy Oakes (New York: Cambridge University Press, 1986), p. vii. In this period of Heim’s thinking, “non-objectifiable” is the same as the epistemological subject, but it is also the space of God. It is impossible to define the concept of “non-objectifiable.” It is also impossible to prove non-objectifiable from the antinomies of experience. As a *via negationis*, it is a non-temporal, non-spatial or non-causal concept, and as such, irrational. Logical negation cannot implicate anything, but according to Heim, reality is more important than logic. Non-objectifiable reality is not real deductively or inductively, because it is scientifically unexplored. However, it is intuitively the most real reality, where the now-point and non-spatial here-point are eternal.
which opens upon us by God’s grace. Without it, we cannot know and experience anything, but with it, the knowledge and belief are complementary. In the opinion of Heim, the concept of non-objectifiable reality has resolved the controversies between realism and idealism, and between subject and object. Non-objectifiable reality is “we-space” that is the volitional, ethical, and indeterministic reality. According to Heim’s doctrine of perspectivity, for example, the risen Christ is now the eternal non-objectifiable center of all possible temporal human destinies. However, this formulation was not sufficient, because in it, the dependence on Christ was parallel with other contingent dependencies, which could not be exchanged with others. I cannot change my self or my homeland. It is not possible that I could have been born in some other place or time. On the other hand, it is possible to look at the world from some other centers than from Christ, for example, from only my own center.46

Heim’s concept of time had an important eschatological viewpoint as well.47 He asked, what is the relationship between time and eternity? The answer depended on both the concept of time and the experience of time. If we could know what time is, we could resolve all metaphysical questions. If time is “straight,” where it is running? From inside time, belief in the future can be pessimistic or optimistic, as in the anthroposophical thinking about the evolution of the soul. From outside time, belief in the future can be only optimistic, as in the philosophy of Plato or in German idealism from Leibniz to Kant, Fichte, Schelling, and Schleiermacher. Einstein’s concept of space-time had changed Kant’s formal and illusory conception of time and space. However, if time is relative, is it a bridge to somewhere that is already existing but not yet visible?48 Henry Bergson had argued that because time is immeasurable, we could only experience it. Heim argued that time itself is the existence-form of “I,” and we can experience time only non-objectifiably.

The last question Heim asked in his GG is, is there only this temporal form of existence (Dasein), or is there also another form of existence? There must be an end of

46 Heim, “Geleitwort,” in GG (1923). See also Ruttenbeck, Die apologetisch-theologische Methode Karl Heims, pp. 64-82.
48 GL, pp. 539-545.
this form of time, in the biblical sense, telos. The answer of existential theology was that in every point of time, eternity is present, and time is always immediately consummatio mundi. The end, which is already here, is becoming. Heim rejected this answer, because it is not a solution to Kant’s antinomies of time. According to Heim, God will create some new form of time in the end of time. For now, any given moment is, on the one hand the last point of time, and on the other hand, eternity in which the creative, invisible, and healing will of God’s possibilities is acting. Thus, Heim’s conception of time was two-dimensional in which one dimension is physical, and the other is eternal.\textsuperscript{49}

The final solution of Heim’s third period was a negation: all perspectives have lost their meaning in the non-objectifiable God. God is beyond the world, and He is both metaphysically and scientifically unexplorable. God’s revelation in Christ was a “transperspective event.” Its consequence was a new transcendent perspective whose center was Christ. The origin and meaning of all intra-mundane propositions was in this supra-mundane world. Thus, Heim rejected Karl Barth’s dialectical theology as inadequate. According to Heim, such ideas of Barth as: God and world were diametrically opposite, and God’s revelation was “straight from above,” were misconceptions. From the dialectical contradictions between Creator and created, life and death, judgment and grace, follows the conclusion that the intersection of vertical and horizontal lines must be in every point of relative time. Heim agreed with Paul Tillich, “Here and only here, namely, in the incarnate Christ, is that genuine place where the vertical line from the top down crosses the horizontal line of events.”\textsuperscript{50}

\textbf{D. The fourth period (1928-1958): Heim’s Dimension-category}

The thinking of Karl Heim continuously sharpened: from the epistemological “decision”-category through the ontological “destiny”-category to the “perspective”-

\textsuperscript{49} GL, pp. 545-568.
\textsuperscript{50} GL, pp. 32-34. Heim, however, rejected Tillich’s purpose to de-literalize, de-onticize, and de-theify Christian theology. Instead, Heim agreed with Tillich’s similar conception with Heidegger about the unity of being and time. About Tillich’s world-view, see Morrison, \textit{Einstein, Kant, and Tillich}, pp. 113-192.
category. This was not the endpoint in the dynamics of his thinking, but only the first round in the battle to understand the relation between God and reality.

Toward the beginning of the fourth period of his thinking, Heim argued that the age to construct new world-views might be over. Belief in a specific world-view has become impossible. However, we must battle with ultimate questions to find a useful solution for them and a way for the steadfast “view of life.” Heim believed that if we could find the answer to the problem of time, it would be possible to answer the other ultimate questions of life. Present and past are not parts of the same continuous interval of time in which consciousness could be experienced, as had been thought from Descartes to Husserl. A new ontology, in which consciousness and physical time belong together, but in different dimensions, must replace this old one. We can measure time, but we cannot know or define it. We can only experience it. Reality is not a thought reality, as the idealists believed, but the experienced reality of a non-objectifiable “I,” as the existentialists argued. The time-space continuum is the basic form of experience, and its zero-point is the perspectival center, the non-objectifiable and eternal presence.

The core of Heim’s thinking was moved toward the “dimensional” thinking. According to Heim, time is a two-dimensional and infinite “space.” Physical time that is one of dimensions of time is formed from time-points, and there are no empty spaces between them. These points flow in the same direction one after another, so that one time-point is always present. In the perception of time, there are disjunctive and conjunctive relationships between time-points simultaneously, which is logically contradictory within physical time. The solution to this antinomy can only be that the ontological concept of the non-objectifiable center point in consciousness of reality is the second dimension of time: nunc aeternum.

Three-dimensional and infinite space is formed from space-lines, which are bi-directional. Space-surfaces are formed from these bi-directional lines. In the perception of space, there are disjunctive and conjunctive relationships. According to Heim, the space-relation is the second level of the time-relation. The three-dimensional experience

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51 See the first edition of Glaube und Denken (1931), pp. 1-22.
52 Ibid., pp. 23-38.
of space is possible only through the synthesis of those contradictory disjunctive and conjunctive relations.

In Heim’s continuum of *five-dimensional* time-space, time is more important than space. The perspectival center of time is not a mathematical point but many simultaneously seeing, knowing, and willing points, which are non-objectifiable, infinite, and conscious spaces. The non-objectifiable and trans-perspectival center of the whole reality is God’s space.

After 1928, Heim began to write his *magnum opus* of six volumes: *Der evangelische Glaube und Denken der Gegenwart. Grundzüge einer christlichen Lebensanschauung*. It was the crystallization of over twenty years of work on a Christian world-view in which the conscious “I” and “Thou,” the world, and God are in a meaningful relationship. Its first three volumes form a philosophical and theological trilogy, and its last three volumes are a scientific and theological trilogy.

The first volume, *Glaube und Denken. Philosophische Grundlegung einer christlichen Lebensanschauung* (*GD*) was an endeavor to give an intelligible, ontological foundation and structure to reality and to God’s revelation and action in it. Heim constructed a dynamic and dimensional world-view, and put it up against the static, mechanic, and materialistic world-view that was the predominate conception of reality in his lifetime.

The second volume, *Jesus der Herr. Die Herrschervollmacht Jesu und die Gottesoffenbarung in Christus* (*JH*), was an endeavor to explain how the supra-polar space of God opened upon us in the incarnation and resurrection of Christ. This and the next volume, mentioned below, were endeavors to explain important theological propositions by using his new language of dimensions.

The third volume, *Jesus der Weltvollender. Der Glaube an die Versöhnung und Weltverwandlung* (*JW*), was an endeavor to solve dimensionally the theological questions

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of guilt and power. The question of guilt is solved first, and the question of power will be solved in the second coming of Christ, when all kind of relativism and contingency will end.


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56 WW, p. 191.
2. The Philosophical Battleground of Heim’s Dimensional Thinking

Throughout his career, Heim’s main battle was with the ideas of Immanuel Kant. Kant’s critical idealism and epistemology were Heim’s point of departure. Heim tried to clarify Kant’s work on the base of the absolute idealism of Johann Gottlieb Fichte, Friedrich Wilhelm Joseph von Schelling and Georg Wilhelm Friedrich Hegel, the Neo-Kantian idealism of Paul Natorp and Heinrich Rickert, the phenomenology of Edmund Husserl, the existentialism of Martin Heidegger, the theories of relativity and critical realism of Albert Einstein, and the quantum idealism of Werner Heisenberg. As was discussed in Chapter I.1, since the second period of his thinking, Heim shifted his focus from epistemology to ontology, which became the new foundation of his dimensional thinking, although the conclusions of his ontological thinking were epistemological. In order to understand Heim’s dimensional thinking, we must first outline Kant’s critical idealism and the most important post-Kantian philosophies with which Heim was debating.

A. Kant’s Critical Idealism

First, it is necessary to understand Kant’s position, the philosophical background to which he was reacting, and the basis of his central thesis. Secondly, it is necessary to understand Kant’s concepts that Heim developed in his dimensional thinking, namely, concepts of space, time, and the self.

Over the centuries, the epistemological questions “What can we know?” and “How can we know?” had been asked mainly in terms of how the mind as an immaterial entity could comprehend to material objects in the world. There were two intellectual

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60 There are many controversial interpretations about Kant’s transcendental idealism and its position in philosophy. Although many arguments against Kant’s idealism claim that it is an incoherent blend of phenomenalism and skepticism, these arguments also have their own inadequacies. Henry E. Allison, Kant’s Transcendental Idealism. An Interpretation and Defense (New Haven and London: Yale University Press, 1983), provides a defending interpretation on Kant. Nevertheless, it is not the purpose of this dissertation to resolve such controversies, but only try to explain those ideas in Kant’s thesis, that are important for understanding Heim’s dimensional thinking.
movements in the early modern period of philosophy that had a significant impact on Kant: empiricism and rationalism. Kant argued that both the method and the content of those ideas contained serious flaws. The empiricists sought an answer to these epistemological questions through the senses and *a posteriori* reasoning, which depends upon experience or contingent events in the world to provide us with information. The rationalists attempted to use *a priori* reasoning, which depended, not upon experience, but on reason itself to inform it.

Empiricists such as John Locke, George Berkeley, and David Hume argued that human knowledge originates in our sensations.61 Locke, for instance, argued that all knowledge of things was derived from sensations that were imprinted on the *tabula rasa* of the mind. His concept of knowledge was that of a classical realism. Experience teaches us everything, including concepts of relationship, identity, and causation. Kant countered that the “blank slate” of the mind is insufficient to explain the beliefs that we have about objects, because some components of our beliefs must be brought by the mind to experience. He had to respond to Locke’s logical “guillotine,” according to which, from what we know, we could not conclude how things really are. Locke’s empiricism was challenged by the material idealism or phenomenalism of Berkeley, who argued that only sensations or ideas were known in human experience. Berkeley explained this in his well-known dictum, “esse est percipi.” For him, material objects were impossible and unknowable outside the mind. In sense-experience, we only have access to our mental representations, not to the objects themselves. Kant rejected this by arguing that Berkeley’s material idealism was actually indefensible in that we are capable of making judgments about our experience. Hume asserted that the only responsible attitude one could take to the question about knowledge was skepticism. In Hume’s opinion, we cannot know the world as such at all, but only our own ideas about it, and these are commonly mistakes. Kant was not satisfied with those incompatible answers of

empirism about knowledge. He asked not how the mind conformed itself to the world, but how the world conformed itself to the mind.62

Rationalists like René Descartes, Baruch Spinoza, and Gottfried Wilhelm Leibniz approached the problems of human knowledge from yet another angle.63 They believed that it was possible to construct knowledge of the external world out of the simplest, indubitable, ideas possessed innately by the mind. Leibniz, in particular, thought that the world was knowable a priori, through logical analysis and derivations of ideas. For Leibniz, supersensible knowledge could be achieved by means of reason. Truths of reason are explicit statements of identity, or reducible to explicit identities by a substitution of the definitions of their terms. Since a finite analysis always reveals the structure of the identity of such truths, they cannot be denied without contradiction and are perfectly necessary. Truths of fact, on the other hand, are implicit statements of identity. These truths are merely contingent and may be subject to dispute, since only an infinite analysis could show them to be identities.

Descartes, armed with the knowledge of his own existence, hoped to build a foundation for all knowledge. Kant argued that knowledge of external objects could not be inferential. The rationalists presupposed that the existence of objects in space and time was outside the mind. Kant’s answer was that our knowledge is constrained to mathematics and the science of the natural, empirical world. Therefore, it is impossible to extend knowledge to the supersensible realm of speculative metaphysics. The reason that knowledge has these constraints is that the mind plays an active role in constituting the features of experience and limiting the mind’s access to the empirical realm of space and time. Kant’s antinomies proved that the rationalists’ position revealed fundamental methodological and metaphysical mistakes. The contradictory claims of rationalism could both be proven, because they both shared the mistaken assumption that it is possible to have knowledge of things, as they are in themselves. These antinomies could be resolved, if we could understand the proper function and domain of the various

faculties that contribute to produce knowledge. It is necessary to recognize that it is impossible to know things as they are in themselves and that knowledge is subject to conditions of experience. Kant’s critical philosophy was an endeavor to redefine the foundations and limits of metaphysics by a novel synthesis of rationalism and empirism.64

Kant’s first task, his “Copernican revolution” in philosophy,65 consisted of asking and answering two kinds of questions: questions of fact (quid facti) and questions of legality (quid iuris). In theoretical, practical, aesthetic, or teleological thought, we make factual claims, accept certain judgments, or employ certain concepts, which must be justified. Kant’s critical or transcendental method was the answer to these questions.66

Kant claimed that the old division between a priori truths and a posteriori truths employed by rationalists and empiricists was insufficient to describe the sort of metaphysical claims that were under dispute. An analysis of knowledge required a distinction between “synthetic” and “analytic” truths. Therefore, according to Kant, if we are to solve the problems generated by empiricism and rationalism, the central question of metaphysics should be reduced to “How are synthetic a priori judgments possible?”67

If we could answer that question, then it would be possible to determine the possibility, legitimacy, and range of all metaphysical claims. A judgment is synthetic if and only if, its negation is not self-contradictory, and a priori if, and only if, it is logically independent of any judgments describing a sense experience. Kant made three claims about synthetic judgments a priori of pure reason: that there are synthetic judgments a priori; that there is only one internally consistent set of synthetic judgments a priori; and that this set has been completely exhibited in his Kritik der reinen Vernunft (Critique of Pure Reason). The set of such synthetic judgments a priori comprises all axioms and theorems of Euclidean geometry, all true arithmetical propositions, and certain

65 Copernicus recognized that the movement of stars could not be explained by making them revolve around the observer; it is the observer who must be revolving. Analogously, Kant argued that we must reformulate the way we think about our relationship to objects. See Cassirer, Kant’s Life and Thought, trans. James Haden (New Haven: Yale University Press, 1981), pp. 148-149.
67 Smith, Commentary, pp. 43-44.
assumptions of Newtonian physics, such as the principles of causality, of the conservation of substance, and of continuity. Kant’s revolutionary notion of synthesis *a priori* was the idea that objects are not simply given in experience but rather constituted as a necessary condition for experience by pure concepts of understanding. The justification of those three claims of the existence, uniqueness, and completeness of the synthetic *a priori* judgments was based on some important presuppositions of a transcendental argument. Kant supposed that we have experience of objects, and that it is possible to distinguish what is “given” to the senses as *a posteriori* content from what is yet ascribed by us to the objects as *a priori* forms. The *a priori* features of the given experience are the necessary conditions of its objective character, which means that an objective experience is not possible without some *a priori* forms. Kant's touchstone was “what we can know *a priori* about objects is limited to that which we ourselves put into those objects.”

Synthetic *a priori* claims are true because of the structure of the mind that knows them. For example, “Every event must have a cause” cannot be proven by experience, because the causal connection is not given in experience, as Hume had argued. Nevertheless, experience itself is impossible without a cause, because it describes the way the mind must necessarily order its representations. The experience is explained by the understanding of the mind, which is a necessary condition of every experience. Empiricists and rationalists think that the mind is passive, either because it finds itself possessing innate, well-formed ideas ready for analysis, or because it receives ideas of objects onto a blank slate. Kant claimed that the experience of the world is possible only actively, because the mind builds a systematic structure of its representations. Therefore, philosophical investigation into the nature of the external world must be as much an inquiry into the features and activity of the mind that knows the external world. It is the mind itself that gives objects at least some of their characteristics, because they must conform to its structure and conceptual capacities, not the reverse.

Kant’s second, subsidiary, task was the justification of his system of categories, which he also regarded as unique and complete. There are four classes of categories:

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68 Kant, B xviii, (III 19). See also Cassirer, *Kant’s Life and Thought*, pp. 157-158.
quantity, quality, relation, and modality, with triadic subcategories. Categories are concepts that occur in non-mathematical and synthetic *a priori* judgments, are *a priori* in the sense of being applicable to, not abstracted from, sense experience, and are applied to what is given to the senses that confer objectivity upon it. The justification of the categories was “transcendental deduction,” which means that what has been established, as being *de facto* is also appropriate *de jure*. Thus, Kant combined the empiricist principle that knowledge has its source in experience with the rationalist belief that knowledge is obtained by deduction. The conditions on which experience as a function rests are at the same time the conditions of everything it yields us. Every determination of an object rests on the interpenetration of the pure forms of intuition and the pure concepts of understanding, through which the manifold of mere sensations is first woven into a system of rules, and thereby constituted as an object.\(^{70}\)

A logical consequence of Kant’s first and second task was that Kant must divide the realm of knowledge into two separate domains: *phenomena* and *noumena*.\(^{71}\) This division led to a new skepticism, which, in fact, Kant tried to avoid. Phenomena were the domain of empirical knowledge that was formed of two elements: experience of the world through the senses and the *a priori* structure of the mind. Knowledge was not a mirror of the world but rather a product of the interaction of senses and the ordering structure of the mind. Therefore, one could not properly speak of knowing things-in-themselves, which belong to the realm of noumena in which there are no categories. He argued that there are two functions of the thing-in-itself: metaphysical (ideal) and epistemological (real). The metaphysical function maintains that there is an external referent beyond our private experiences. In fact, Kant believed that he had given a solid proof of objective reality. “Otherwise we would have to make the absurd conclusion that there can be appearances without anything that appears.”\(^{72}\)

The epistemological function of the noumenal thing-in-itself sets a boundary to sensibility, and hence to the kinds of objects that we can claim to know. In addition, in the domain of noumena belong those things of which no sensory experience is possible, even in principle: the universe as a causal whole, the human self as a free and immortal

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\(^{72}\) Kant, B xxvi.
agent, and God. There could be no proper knowledge of such noumenal entities. Only phenomena could be known by pure reason. Kant’s claim, however, does not mean that he was a Berkeleyan idealist or Cartesian skeptic. He did not claim that we know only the contents or ideas of our own minds. Kant was an empirical realist rather than an empirical idealist.  

Kant claimed that if metaphysics were a science at all, it would be necessary to think that the world, in a “regulative” or “ideal” sense, was a causal whole. In order for moral action to take place, it is necessary to assume the idea of the freely acting and immortal ego, but we cannot know anything about this ego. In order for the world to be more than a mere aggregate of disparate objects and causal chains, it is necessary to think of a perfect unifying principle for all reality, namely, the idea of God. Kant argued that, since Aristotle, philosophers have concluded that if there is no entity that is purely “in itself” and “through itself,” then there is no secondary and dependent thing thinkable. Thus, all actuality as a whole dissolves into insubstantial illusion.

Kant criticized all arguments for God’s existence because we can only think that God exists. His criticism concerning the ontological argument for God’s existence was, however, logically inadequate. The ontological argument for God’s existence as a necessary being:

\[(1) \quad N(\exists x)((y)(y \text{ exists} \supset x \text{ exists}))\],

where “N” is the necessity operator, is logically true. It says that, in each world, there is something such that if anything at all exists in that world, it does. Thus, it seems that this sentence expresses precisely the necessary existence of an existentially perfect being. Kant argued that “from any given existence we can correctly infer the existence of an unconditionally necessary being,” that is, a God. However, in different worlds such Gods can be entirely different from each other. Therefore, the defenders of the ontological argument have argued that the sentence:

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73 Allison, *Kant’s Transcendental Idealism*, pp. 3-13.

74 About Kant’s postulates concerning the cosmos, the soul, and God, see Cassirer, *Kant’s Life and Thought*, pp. 199-217, and about a demonstration of the existence of God, Immanuel Kant, *Der einzige mögliche Beweisgrund zu einer Demonstration des Daseins Gottes (1762). The One Possible Basis for a Demonstration of the Existence of God*, trans. Gordon Treash (Lincoln, NB: University of Nebraska Press, 1994).

75 Kant, A 588 = B 616.
must be proved. We would be able to infer (2) from (1) only if we could assume that all
these individuals are identical with each other. The switch of the quantifier in the
sentence (2) is, however, an illegitimate step in logic. The ontological reasoning of
Descartes and Leibniz is impossible from a critical viewpoint, because it presumes, not
demonstrates, that which must be proven. In addition, such presuppositions are only
contingent, even if they were formally or materially non-contradictory and possible. The
premise of all ontological arguments is the sentence

(3) (∃x) it is known that (God = x).

The “one possible basis for a demonstration of the existence of God” was,
according to Kant, a “genetic” foundation. That God is the a priori necessary being will
be shown by proving that there is a function that is essential and can be assumed only by
a being who cannot not be. Kant’s strategy was to show that God is necessary because
certain things are possible. Kant’s argument reversed the Cartesian one: it moves from
possibilities, as consequences, to the necessary being as their ground. Kant argued that
only those elements that correspond to the possibility of an experience in general, that is,
only those elements capable of being found in space and time, are possible objects of
experience. Thus, only potential objects of sensible experience are the material of
possibility.⁷⁶

Kant did not speak just of “existence,” “being” (Sein), and “is,” but also of
“position” (setzen). He stated that “being” could never be a real predicate but only the
positioning of a thing, or of certain determinations as existing in-themselves.⁷⁷ “God is
omnipotent” could be true even if there were no God. If God were possible, in the fullest
sense of the word, for Kant, as God was possible for Leibniz, that is, possible in
experience, God would presumably and eventually be actual, and hence always actual.
From mere conceptual possibilities, it is impossible to infer actual existence.⁷⁸ Thus,

⁷⁶ Jaakko Hintikka, “Kant on Existence and Predication, and the Ontological Argument,” in The Logic of
1986), pp. 249-267. See also Gordon Treash, “Introduction,” in Kant, One Possible Basis, pp. 9-32, and
Smith, Commentary, pp. 525-537.
⁷⁷ Kant, A 598 = B 626.
⁷⁸ Kant, A 601-602 = B 629-630.
Kant thought that we cannot prove the existence of God but only postulate a God practically, which is necessary to complete the account of the ethical life. Although it was impossible to know anything about noumenal entities, it was possible to think them as useful ideas, and it was necessary to believe in their possibility for practical reasons. For example, God is a mere idea, because He is an *ens realissimum*, the sum total of all reality.

Thus, from the division of reality into the realms of phenomena and noumena followed the division of pure and practical reason, of knowledge and faith, of facts and values, and, at last, of science and religion.

The most crucial tenet of Kant’s transcendental idealism was the ideality of space and time. Kant once agreed with Leibniz that space is relative. Space was a phenomenon of relations among substances, which are unextended and dimensionless mathematical points. According to Leibniz, the entire world of extended matter is constructed from simple immaterial substances, monads, or entelechies. Spatial magnitude was the only measure of the intensity of the forces exerted by any substance. In fact, Leibniz held that neither space nor time is a fundamental feature of reality, because the individual substances, which stand in spatial relation to each other, are reducible to the non-relational “windowless” and timeless properties of individual monads. Space and time are thus unreal. Nevertheless, references to spatial location and temporal duration provide the possibility for keeping track of the relations among a consistent set of monads, which make up the actual world. In a universe of mirrors, each reflects any other, along with its reflections of every other, and so on *ad infinitum*. Leibnizian space is the positional *quality* of material objects in the best possible world. Space without any material object is inconceivable.

Later, Kant abandoned the notion of relative space and embraced the Newtonian concepts of absolute space and absolute time but as a metaphysical fashion. Newtonian

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79 See Norman Kemp Smith, *Commentary*, pp. 527-542.
space is the *container* of all material objects, and a material object can only be conceived as existing in space. Space appears as a reality, which, in a certain sense, is prior to the material world. In the opinion of Kant and his followers, Leibnizian space was insufficient to serve as the foundation for Newton’s principle of inertia and the law of motion.\(^{83}\)

Kant thought that he had found an incontestable proof for the existence of absolute space independent of the existence of matter. Kant based his proof on the distinction between left and right. He argued that the intrinsic relations among the individual parts of our left hands with regard to each other are the same as in our right hands, but that a fundamental distinction makes it impossible to substitute one hand for the other. He believed that this phenomenon could be explained only by absolute space. It is only one’s immediate intuition that distinguishes between left and right, and it is one’s immediate intuition that forms the general concepts of Euclidean geometry and makes their statements evident. For Kant, the problem of space was no longer a problem of physics but an integral part of transcendental idealism.\(^{84}\)

Kant classified space and time as “forms” of sensibility (*Sinnlichkeit*) in the mind. These two forms do not relate to things-in-themselves, but only to the appearance of reality. All experience shows its objects in space and in time. Thus, space and time are neither objective nor real, but subjective and ideal fictions. Kant designated them as “sensitive concepts,” whose applicability is restricted only to sense experience or to phenomena. Neither these sensitive concepts nor such “intellectual concepts” as causality and substance applied to objective reality. The forms and categories of the mind are not intrinsically objective or real, because they are only subjectively located in the mind, and their status in reality is ideal rather than physical. There is no object in the external world called space. It is not an object of perception but a mode of perceiving objects.\(^{85}\)

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\(^{84}\) In fact, until 1956, when for the first time the conservation of parity was called into question, it was generally believed that all laws of nature are invariant with respect to an interchange of right and left. See Jammer, *Concepts of Space*, p. 134.

Kant evaluated the validity and universality of space and time by the science of Euclidean geometry, which has apodictic certainty, that is, a certainty that avoids contingency and possesses both universality and necessity. The reason that synthetic a priori judgments are possible in geometry is that space is an a priori form of sensibility. Kant agreed with Hume that inductive perception could not yield principles that are apodictic. By hypothetically granting the status of “pure intuition” to space and time, Kant believed that he had incorporated them into the science of metaphysics. These two forms of intuition belong to the “subjective constitution” of the mind, and in epistemology, this location was a prerequisite for a priori certainty. Thus, the concepts of space and time as subjective forms of intuition are mathematically and metaphysically infinite. However, according to Kant, everything that we sense in space and time is empirical and finite.  

Kant’s space is neither a purely empirical concept, nor a property or form of things-in-themselves. Nothing perceived in space is a thing-in-itself. Instead, space is a form or a pure intuition a priori, which is universal, necessary, certain, and objectively valid, but not necessarily transcendental. Space is transcendental when applied to objects in general, but it is empirical when restricted solely to objects of sense. External objects are mere appearances or representations within our sensibility. The object, the thing-in-itself, is not known and cannot be known.  

Like space, Kant’s time is a pure form of sensible intuition a priori, not an empirical concept derived from our experiences. There are three different basic determinations, three modes that must be distinguished within the idea of time, and in which the idea itself is fulfilled: duration, succession, and simultaneity. Different times are always successive and irreversible formal orders. Successiveness is directly linked to the notion of alteration and contradiction, that is, in a relation of either-or. Only in time is it possible that two opposite predicates meet in the same object one after the other. Thus, the a priori notion of time as a pure intuition is presupposed in Kant’s notion of the principle of non-contradictory. There are three components in the principle of non-contradictory:  


87 About Kant’s conflicting views of space, see Smith, Commentary, pp. 89-122.
contradiction. The first is that a thing cannot be itself and the opposite of itself simultaneously. The next can be called the principle of mutual exclusion, which means that if one definition or state exists, the other cannot exist simultaneously. The final component is the principle of the excluded middle, which asserts that some definitions or states of reality are not only mutually exclusive, but also exhaustive possibilities. For example, the states of death and life are mutually exclusive and exhaustive of the possible states: one cannot be both dead and alive, or neither dead nor alive.88

Like space, time is nothing but a subjective condition, and without this condition, there is no intuition.89 Whereas space is the formal a priori condition of outer experiences, time is the formal a priori condition of appearances. Knowledge is ultimately subject to time, which provides causally ordered and successive relations for representations. Like space, time has a dual status: empirical and transcendental. Time has an empirical, objective validity in respect to objects given to the senses, and a transcendental ideality, because it does not inhere in things-in-themselves, but only in the mind. If this subjective condition of sensibility were removed, time would be nothing at all. Thus, space and time are given to us a priori, whereas everything that is given in them is a posteriori.90

Finally, Kant’s transcendental idealism was a critique of the epistemological subject rather than a critique of the epistemological object. The statement “I think” was a formal necessity, a unifying principle that constituted a necessary precondition for any consciousness. It was not equivalent to a “person” but only to that non-material conception of the “I” that thinks, a conception that is transcendally necessary for there to be conscious at all. “I” was neither a “thing” nor substance, not a soul, nor the self-in-itself. The determination of a pure form of knowledge must precede a determination of any object of knowledge. The ego or “subject” was none other than reason itself, in both

89 “Die Zeit ist also lediglich eine subjective Bedingung unserer Anschauung und an sich, außer dem Subjekte, nichts. Nichtsdestoweniger ist sie in Ansehung aller Erscheinungen, mithin auch aller Dinge, die uns in der Erfahrung vorkommen können, notwendigerweise objektiv.” Kant, B 51-52.
90 About interpretations of Kant’s conception of time, see Cassirer, Kant’s Life and Thought, pp. 160-161, 183 and Smith, Commentary, pp. 123-134. See also Kotkavirta, “The Concept of Infinity in Kant and Hegel,” in ICD, pp. 14-15.
its universal and its particular functions. The ego that thinks and is necessary for consciousness is only a subject of experience, not an object of experience. Only on moral grounds, never through any purely theoretical analysis of cognitive experience, can it be proved that the self is an abiding personality, and that the conscious, personal form of the self belongs to the order of noumenal reality. Because the “I” cannot be an object of experience, categories of understanding cannot be applied to it. This subject, the ego, cannot be considered as either a unit or a plurality of substances, cannot be exhibited in causal relationships, and cannot be known.

Kant’s critical transcendental idealism was an endeavor to avoid subjective or psychological idealism, solipsism, positivism or dogmatic realism, relativism, or any combination thereof. These positions can only be avoided by postulating and justifying on *a priori* grounds some type of realism, objectivity, external order, and something that is designated as absolute.\textsuperscript{91}

Kant’s arguments were designed to show the limits of our knowledge. Against the rationalists, who believed that we could possess metaphysical knowledge about God, souls, and substance, and that such knowledge was transcendentally real, Kant argued that it is not possible to gain knowledge beyond the empirical. Against Hume’s empiricism, which concluded that reality is an aggregate of subjective, atomic sense impressions without causal order and without external objects causing these impressions, Kant’s transcendental method or deduction and the synthetic *a priori* unity hypothetically postulated and constituted a unified technical apparatus as a necessary condition for completely overcoming the otherwise inescapable consequences of Hume’s position. As a transcendental idealist, Kant believed that the nature of objects, as they are in-themselves, is unknowable, but knowledge of their appearances is still possible. Thus, Kant was also an empirical realist about the world we experience as it appears to us by means of space, time, and categories. His critical idealism was a combination of rationalism and empirism.\textsuperscript{92}

\textsuperscript{91} Allison, *Kant’s Transcendental Idealism*, pp. 272-293.
B. *Post-Kantian Philosophies*

The vast amount of post-Kantian philosophical literature and their different interpretations, criticisms, and modifications of Kant’s central thesis prove that Kant’s transcendental idealism and its method was not the final “theory of everything” in philosophy. One of the main concerns of post-Kantian philosophy has been that of ontology. German absolute idealism, phenomenalism, and existentialism represented this ontological concern. On the other hand, within the field of epistemology, one may discern at least three major currents of thought: positivism, Kantianism, and the semantic tradition. Their common issue has been what stance should be taken toward *a priori* knowledge. Positivists denied it, Kantians explained it through Kant’s “Copernican revolution,” and those of the semantic tradition believed in it but not in the constitutive power of the mind. They argued that the root of all the confusion found in idealism is the effect of misunderstanding its conceptual meanings.93

Heim’s own philosophical battle concerned the controversy between idealism and realism. He sought to resolve the contradictory with his idea of dimensional thinking, which was based on ontology, but which also provided answers for epistemological questions. The most important post-Kantian philosophies for Heim’s dimensional thinking were the ontology of the German idealists Fichte, Schelling, and Hegel, the Neo-Kantian idealism of Natorp and Rickert, the epistemological phenomenalism of Husserl, the existentialism of Heidegger, the critical realism of Einstein, and quantum idealism of Heisenberg.94

German absolute idealism was an ontological response to Kant’s epistemological critical idealism.95 Its adherents were not so interested in what we put into objects or what the objects put into our minds, but in providing a philosophical inspiration and enthusiasm for action. German idealists believed that philosophy is not only a scientific

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94 The subsequent analysis is based only on certain interpretations and commentaries about those philosophers with whom Heim debated. I refer only occasionally to the original works of those philosophers, because the purpose of this chapter is only to describe the philosophical battleground in which Heim developed his notion of the dimensional thinking.
95 According to Solomon, *From Hegel to Existentialism*, pp. 18-36, epistemology in German idealism was an “ontology of knowledge.”
exercise but also a vision, a statement of purpose, the development of a point of view. The perspectival stand for something could be a stand for the importance of the arts or politics, for sympathy or passion, for a way of thinking and living.  

Fichte developed the principle that the unity of subject and object, of presentation and thing, can be found only in constitutive activity of self-consciousness. He called this subjective consciousness the “transcendental ego” or the “self-positing I.” He noticed that Kant’s account of experience created a vital tension between the roles of pure intelligence and of objects as noumenal realities, and it was necessary to maintain a balance between them. Fichte argued that it is necessary to choose one of two alternative views: to emphasize the knower and ignore the known as a thing-in-itself, or to ignore the knower in order to focus on the reality of the known. He chose the former, subjective course, because he believed that it alone was capable of securing the freedom required for an adequate account of morality. He argued that all philosophy and all reality begin with the transcendental ego, the elusive but active noumenal self, which is identifiable only in an indefinitely repeated reflection upon primary experience. This conscious self expands itself infinitely to do everything and to comprehend everything. The freedom of the ego must be the basis of all philosophy, both theoretical and practical. Thus, Kant’s “autonomy” of the self is, according to Fichte, the foundation not only of practical or moral philosophy but also of the theoretical philosophy of knowledge and being.

Schelling argued that the most general proof of the overall ideality of knowledge was carried out in Fichte’s “science of knowledge” (Wissenschaftslehre) by the immediate inference from the proposition “I am.” What remained was to prove Fichte’s theoretical position and to construct a reliable, monistic, and objective system of absolute idealism that could verify Fichte’s subjective thought. Such a system would give substance to a perceptual and cognitive idealism by demonstrating that the objective world is in a process of emergence from the “self” and its activities. The world was constructed from the self’s fundamental quality, namely, freedom. Schelling’s task was

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96 Ibid., pp. vii-xii.
to prove the identity of transcendental idealism and of realism, and thus to elevate transcendental philosophy into an “ideal-realism.”

Schelling argued that the self is primordially both active and limited, and it makes itself to be both subject and object, finite and infinite. In his system the self returns from limitation to its original freedom in a dialectic process, and for the first time becomes conscious of itself in what it already was in itself, namely, pure freedom. Schelling’s treatment of Kant’s philosophy emphasized the primacy of the practical. Time played the central role in the synthesis of finite and infinite self-consciousness. Like Fichte, and later Hegel, Schelling stated that cognition and action are fundamentally the same. It means that one’s identity is a basis and motivation of reason both in cognition and in action. Yet, reason as a free act of spirit or will also seeks to find and establish itself in the other – the non-self. The practical was over the theoretical, and spirit over nature. In Schelling’s philosophy of nature, nature itself is spiritualized. From the pragmatic or spirit-centered standpoint, Schelling interpreted all being, in its objective aspects as well as its subjective ones, through categories of willing. Freedom was not simply activity of self. It must be more than a concept in the domain of the possible. It must be the archetypal origin, the principle of existence and actuality. Freedom was the place in which thinking, as an interplay of concepts, ceases, and reality begins. The actual takes precedence over the possible, the practical over the theoretical.

Schelling’s “ideal-realism” had two distinct systems at play. The first system was a reflexive relation of the self, an immanent unification of human knowledge under a dialectic process. The second system was a comprehensive science of reality. The latter, as a philosophy of nature, included the former, and the two were joined through a transcendental logic or a metaphysical theory of identity and difference. Schelling attempted to preserve the distinction between knower and known, between subject and object, between “ego” and “non-ego,” by describing their interdependence. He argued that Kant’s accounts of causality and teleology were not sufficient to explain the connection between the object and our knowledge of it. He believed that there is a perfect parallel between the nature and the structure of our consciousness. The nature

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99 Ibid., pp. xvi-xx.
reflects consciousness. This proposition was not true from the perspective of the individual ego, because the world does not invariably conform to each individual’s thoughts about it. Avoiding subjectivity, Schelling postulated an objective, and transcendental consciousness, an absolute ego that simultaneously contained the thoughts of every individual ego and provided the noumenal ground for every material object. By shifting from the finite individual ego to the infinite reason of absolute ego, he employed the notion of “monism” to express the fundamental identity of the real with the rational. Schelling made realism and idealism parallel, and demonstrated their ideal principle, the polarity between the conscious and empirical ego and the unconscious and absolute ego within it. The reason of absolute ego is systematic: an ordering and pattering will to know, a will to discover itself in the known. Everything is at once a priori and a posteriori, and so all our knowledge is empirical.\(^{100}\)

According to Schelling, there are two types or ways of knowing: objective and non-objective. The self is pure inwardness, a state of being with an infinitely non-objective intellectual intuition that is self-constituting. It exists by knowing itself in this non-objective manner. The self’s objective knowing and activity is the becoming of a world for it. Self-consciousness is thus a steady, enduring juxtaposition of conscious and unconscious activities, and an ongoing translation of the self from the unconscious over to conscious will. All predicates apply only to the will that is a primordial being. The willing and acting self is an act of knowing. Knowing is directed only to the past, that is, an objectivity of a thoroughly determined world.\(^{101}\)

Hegel developed German absolute idealism as an objective and global perspective of entire reality. He rejected Fichte’s enthusiastic individualism by arguing that the individual is unimportant within the perspective of history as a whole. Spirit (Geist) is the main conception of Hegel’s philosophy. Spirit refers to some kind of general and abstract consciousness, a single mind common to everyone. In other words, spirit is the absolute conception of humanity as one. There are no opposition between an individual oneself, others, and God. Absolute consciousness is the explicit recognition of one’s identity as universal Spirit that ignores individual differences but not deny them. Our

\(^{100}\) Ibid., pp. xx-xxx.
individual minds are not only one consciousness but also individual at the same time: unity in difference. In Hegel’s absolute idealism, “I” am something other than a person, namely, a part of the superpersonal and abstract Spirit. Hegel’s purpose was, on the one hand, to resolve epistemological disharmonies between subject and object, and on the other hand, disharmonies of Christianity by introducing an immanent God and World-Spirit to Christian theology.

Like Kant’s ego, Hegel’s Geist was a treatise on self-knowledge. The nature of the knowing subject was the key to all philosophical understanding. Hegel’s Geist replaces Kant’s ego by removing certain philosophical perplexities, which that was incapable of resolving. Hegel tried to avoid the methodological solipsism, to which “I think” of Descartes and Kant’s transcendental ego as a starting point irrevocably lead. For Descartes, “I” is neither person nor human body but the thinking substantial mind. For Kant, “I think” is a formal necessity, a unifying principle that constitutes a necessary vehicle of all concepts for any consciousness. The “I” that thinks and is necessary for consciousness is only the subject of experience, not an object of experience. Hegel, instead, argued that a self has knowledge purely of itself in the absolute antithesis of itself. Geist is in every experience but it is not itself experienced in any of these. Hegel’s Geist is Kant’s ego without the unwarranted claim there is one ego per person. Geist is a transition from a personal subject to a universal subject.102

The “ontological epistemology” and “ideal-realism” of German idealism strongly influenced Heim’s dimensional thinking, especially Fichte’s concept of non-objectifiable “I,” Schelling’s concept of “polarity,” and Hegel’s concepts of “universal subject” and “immanent God.” However, Heim’s dimensional thinking was closer to Schelling’s “ideal-realism” than to Fichte’s “self-positing ego” and Hegel’s “Geist as the divine subject.” Like Schelling, Heim stated that time played a central role in the synthesis of idealism and realism. Both men interpreted reality as an objective and subjective being through the categories of a knowing and a willing ego. Such distinctions in Heim’s dimensional thinking, as “identity and difference,” “part-relation or inclusion,” and “two kinds of a knowing way,” were similar to those of Schelling’s metaphysical theory. The concept of “polarity” was one of the basic concepts in both their thinking. It explained

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102 Solomon, From Hegel to Existentialism, pp. ix, 3-17.
the tension and interdependence between knower and known, subject and object, ego and non-ego. Like Schelling, Heim thought that there was a parallelism between nature and ego, that nature reflects consciousness. Thus, both of them were “panpsychists,” as we shall subsequently see.

The next influential front of Heim’s philosophical battleground was Neo-Kantianism. Heim tended to agree with Neo-Kantian pluralists in both the so-called Marburg School (in which Paul Natorp, José Ortega y Gasset, and Ernst Cassirer were prominent members) and with the so-called Freiburg School (in which W. Windelband and Heinrich Rickert were members). The Marburg School was more philosophical than scientific, and the Freiburg School was more concerned with an extension of Kant’s thoughts relating to the cultural sciences.¹⁰³ The most important concepts for Heim’s dimensional thinking were Natorp’s concepts of “poly-dimensionality” and “supra-world,”¹⁰⁴ and Rickert’s concept of “non-objectifiable.”

Paul Natorp tried to build a general psychology in accordance with Kant’s critical method. For him consciousness is not a part of reality. Rather, it is a psychological foundation and precondition for reality. Psychology cannot attempt to know consciousness by describing it as some sort of analogue of objective reality. It must see consciousness as something irreducible and ultimate, which can only be disclosed as such, but which cannot be explained in accordance with the categorical forms of our knowledge of things, and in particular not in accordance with the categories of substance and causality. The intuitive or thinking ego is not something that exists in space and time, but is solely the pure fact of appearance. According to Natorp, there are three dimensions of reality: the theoretical and ethical dimensions of Kant, and the supra-world of art and religion. The mind cannot be logically subordinated to these worlds or set beside them or over them. The mind is not accessible either by direct observation or by any instrument of empirical psychology, nor can it be simply postulated as a hypothetical basis of explanation. The concept of “relation” was the very foundation and

¹⁰³ Coffa, Semantic Tradition from Kant to Carnap, p. 57.
¹⁰⁴ No one of Heim scholars has noticed the influence of Natorp’s “poly-dimensionality” and “supra-world” on Heim’s dimensional thinking.
presupposition for all critical psychology. Natorp argued that relation seems to be so essential to consciousness that all genuine consciousness is relational. 105

Natorp’s relational phenomenology of consciousness was similar to Heim’s dimensional thinking in which the epistemological subject is the non-objectifiable and eternal center of reality. However, Heim rejected Natorp’s philosophy of immanence, the doctrine that all objects of knowledge are non-existent and present only in the act of knowledge. With classical idealists such, as positivists Richard Avenarius and Ernst Mach, and the neutral monist Bertrand Russell, Natorp argued that we should accept the existence only of what is at least in principle observable, and that knowledge is possible only when concept and intuition join together to give us information about reality. The existence of observable objects offers sensible, inductive grounds for discarding the notion of things-in-themselves, and the joining of concept and intuition tells us why we could know nothing about them. Realists believe that there are things-in-themselves, real objects that are entirely independent of mind, and it assumes that we can see, touch, and otherwise recognize the existence of these objects. Immanentists dismiss the claim of realists and since they see no other reason for the belief in things-in-themselves, they drop it too. 106 Heim agreed with realists that there is an objective reality independent of the mind, an “it”-world that is in a dimensional relation with the epistemological subject “I.”

For Heinrich Rickert epistemological questions were concerned with the formation of concepts. The conditions for the possibility of knowledge of an object were conditions for forming concepts of that object. Valid formation of concepts, therefore, constitutes knowledge. 107 Rickert rejected epistemological realism, the correspondence theory of truth, and epistemological naturalism, that is, psychologism and historicism, which reduce philosophical questions to empirical problems. According to him, reality as an object of experience is an infinite conglomerate of single events and processes that has no identifiable temporal beginning or end and no discernible spatial limits. Moreover, it appears in endless numbers of combinations. The fact that reality is “extensive” infinite

106 Coffa, *Semantic Tradition from Kant to Carnap*, pp. 185-186.
means that as a whole it cannot be exhaustively incorporated into experience and that it is impossible to survey it in toto. In addition, each event and process within this infinite conglomerate is also infinitely complex in numbers of parts and aspects. Rickert calls this the “intensive” infinity of reality. Thus, reality is irrational both as an infinite whole and as infinite parts and aspects. This concept of the irrationality of reality was not an ontological doctrine but a phenomenological claim whose core was the concept of “non-objectifiable.”

Rickert separated epistemology from methodology. The systematization of constitutive forms is the domain of epistemology or the theory of knowledge in general, and the systematization of methodological forms is the domain of methodology or the theory of scientific knowledge. Rickert proposed both a theory of the formation of concepts that holds that knowledge cannot qualify as a reproduction of reality, and a theory of truth that holds that the idea of a correspondence between any set of propositions and reality is incoherent. Thus, a proposition is true not because it corresponds with reality, but because what is asserted by the proposition is valid as a representation for reality. Truth is a value, and the domain of values is an ideal, not a real, domain. This means we cannot argue that what exists is true. It can only be said to hold validly. Knowledge has essential aims or cognitive interests that, in the face of the infinite complexity of reality, identifies specific aspects of reality. In light of the essential values of truth, we expect knowledge to be build by certain methods. Nevertheless, according to Rickert, given the irrationality of reality, knowledge is possible only by means of “concepts. Therefore, Rickert’s theory of method is a theory of concept formation.

As was discussed in the previous Chapter I.1, Heim borrowed Rickert’s concept of “non-objectifiable.” He agreed with Rickert that the epistemo logical subject is “non-objectifiable,” but rejected that it is some kind of “common consciousness” (Bewußtsein überhaupt), and that the individual “real subjects” are only objects.

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108 Ibid., p. xvi.
109 Ibid., pp. xviii-xix.
110 GD, pp. 145-147.
The next influential front of Heim’s philosophical battleground was phenomenology and existentialism. These philosophies have long been associated. Phenomenology is often characterized as an attempt to demonstrate the “objective validity” of the fundamental principles of mathematics, natural science, epistemology, and ontology from the standpoint of “transcendental subjectivity.” Edmund Husserl initiated it in his austere and hard to understand lecture notes and manuscripts, most of which are not published. Descartes and Kant were his most important philosophical predecessors. Husserl’s phenomenology has the Cartesian emphasis on the primacy of the experience of the ego and the Kantian search for basic *a priori* principles. It started with the study of human consciousness, attempted to define the structures that are essential to all possible experiences, and searched for foundations. Husserl tried to find the *a priori* principles of all human cognition.

Existentialism also begins from the Cartesian standpoint of the ego, but it moves from a focus on knowledge to a focus on human action. Martin Heidegger interpreted consciousness not as knowing but as acting, willing, and deciding. Kant’s practical reason and its freedom posed a fundamental problem to Husserl and to Heidegger. For Heidegger it was a means to understand what it is to be a person, and what the universal, *a priori*, essential, existential, and ontological presuppositions of human action are. 111

Husserl, whose phenomenology Heim used as a method of his dimensional thinking, argued that his phenomenology was a “presuppositionless” method without any theoretical bias, and that its results were unconditionally true. He insisted that phenomenology consists solely of descriptions, and it neither presupposes nor advances any philosophical theories, because there are no possible philosophical theories. Theories always assert something more than their data, and this “something more” has no place in philosophy. Every philosophical proposition must be constantly open to questions. Therefore, a presuppositionless philosophy will admit only those propositions that will be true and acceptable in any intellectual environment, and phenomenology must limit itself

to reconfirmable descriptions of experience and the role of ego in the “intuition of essences.”

Like Kant’s critical idealism, the phenomenology of Husserl was a combination of rationalism and radical empiricism. With the rationalists, he maintained that we can and do have knowledge that is not empirical. With the empiricists, he said that all knowledge comes from intuition. Husserl rejected the Cartesian distinction between experiences and the objects themselves. His concept of “phenomenon” represents something that is both an experience and something that is the object itself. The phenomenon is a directly evident object as it is consciously experienced.

The phenomenological standpoint for Husserl is the ego, which “inhabits” consciousness and is in some sense responsible for one’s consciousness of the world, as Kant had argued. However there are important differences between Kant and Husserl. For example, Kant distinguished between phenomena, which are given in intuition, and noumena, which lie behind the transcendental horizon of intuition. Yet, Husserl rejected this distinction and insisted that phenomena are the things-themselves. He held Kant’s distinction between sensibility and understanding, and that a priori principles of understanding are given in intuition, but argued that his own concept of intuition includes parts of what Kant had divided into sense and understanding.

There are at least two possible directions to explain the notion of “phenomena”: reduce them to the notion of “experience,” or interpret them as if they were not to be distinguished from things-in-themselves. For the analysis of “consciousness” there are also two explanations: consciousness is either a mysterious and autonomous realm or substance, as Descartes had thought, or it is nothing at all, as Spinoza and Wittgenstein had thought. Descartes distinguished between mental and physical substances, and his followers spoke of a distinction between “in the minds” and “in the world.” Husserl argued that such theories of mind are simply products of a careless phenomenological description, and they do not explain what consciousness really is like. From Franz Brentano he borrowed his central thesis that consciousness is intentional. Intentionality

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112 “Essence” is concept or proposition, but not in a psychological fashion. Concepts are different from people’s having concepts, as propositions are different from people’s believing propositions. Essence is what gives meaning to experience, what make it possible for us to see objects. When I see a dog, I see that it is dog. See Solomon, *From Hegel to Existentialism*, pp. 175-176.
means that consciousness always takes an object, and its act is always directed towards something. Knowing is always to comprehend something. The intentional object is a material object, but it may also be something unreal, propositional, or ideal object. There is a correlation between act and object: every act has at least one object, and every object has at least one possible act. The intentional act constitutes the object. Without act, there would be no object. A phenomenon is an object as intuited, that is, phenomena and things-in-themselves are identical as intentionally experienced. The analysis of meaning of object and the analysis of what it is for there to be an object are identical. In phenomenological or transcendental reductions, the description of phenomena is reduced to a description of essences, to focus attention on the meaning of phenomena rather than on peculiarities of any particular experience. In addition, in such reductions, the problem of existence is bracketed out in an “epoche.” The epoche means that when we describe the essence of something, its existence is irrelevant. For instance, for Husserl, the existence of the ego, the world, or God, was as such irrelevant. He did not doubt, or did not seek a proof, as Descartes did, but only sought to describe what it was to believe in one’s own existence, in the existence of the world, and in God.113

The point of departure in the existential phenomenology of Martin Heidegger was not epistemology but ontology, as was the case for Heim. The primary task of philosophy is to understand being itself, not merely our knowledge of it. Traditional metaphysics focuses on what is, but Heidegger argued that it might be far more illuminating to examine the boundaries of ordinary knowledge by trying to study what is not. The basic question of Heidegger’s existentialism was “what is it to be or not to be a person?” that is, what is the “existential foundation,” or the a priori principles, regarding what it is to be human? The ability to think and to know is important for human beings, but it is most important to ask who I am or who I am not, and what I ought to do or not to do. The question of self-identity is, for Heidegger, ontological. No one finds out who he is, but he decides, and acts upon his decision. We are what we do.

113 Ibid., pp. 169-175.
Fundamentally, we do not know objects in the world, but we simply use them. The problem is to explain how we can use them and live with them. This means paying attention to those intentional acts that are not merely cognitive but also involve caring, desiring, and manipulating. Such acts are also tied to moods and emotions. No one is a detached consciousness and can abstract himself from the world around him. He is essentially a “being-in-the-world” who cannot “bracket existence,” as the Husserlian epoche requires. Both human existence and that of the world around us are given as the starting point of all phenomenological description. The study of phenomena and the study of things-in-themselves are not separable enterprises, because phenomenology and ontology belong together.

Heidegger’s introduction of the notion of “being-in-the-world” was one of the most radical moves in modern philosophy, because he rejected not only Husserl’s epoche but also the entire tradition of epistemological dualism. Heidegger demanded that philosophy must begin with the single concept of “being-in-the-world,” which is not separable into consciousness on the one hand and objects on the other, whether these objects have intention or are things “in-themselves.” He distinguished only between ontic and ontological structure, that is, between those structures that exist before we are aware that they exist, and those that come into existence only with reflection. He also rejected the idea, proposed by Descartes, Kant, and Husserl, that consciousness is essentially self-consciousness. The self is not a peculiar internal object that inhabits consciousness or lies behind it as a transcendental or formal principle that unifies our experience. We become “selves” by looking at ourselves as other people look at us, that is, it develops only in the company of other persons.

Heidegger did not find satisfactory solution to the question whether the objects are “given in intuition” or “constituted by consciousness.” Husserl held the two notions together. Heidegger accepted this problem as a necessary peculiarity of human existence. One can never tell how much of what we see is there independent of us, and how much of what we see is created by our viewpoint, language, and presuppositions. To be a person means that we are in a position of never being able to know what is given and what one can produce. There is no answer to the existential question: “Who am I?” One is thrown
into the world and into a particular situation in which he is not free. We must make decisions but we do not know “which is which.”

Heidegger’s conception of time was the ontological foundation of his existentialism. His lecture, *The Concept of Time*, presents a number of theses that were expanded and incorporated into his work, *Being and Time*. His main argument about time was that the world’s time or clock-time is ontic and “inauthentic.” Within it, events take place. There is no absolute space, absolute time, or absolute simultaneity. There are only changes in time. Time is something to which a now-point may be arbitrarily fixed with respect to two other time-points (one earlier and one later), and yet no now-point of time is privileged over any other. This time is thoroughly uniform, homogeneous, irreversible, and measurable. Yet, Heidegger had another argument about time, namely, that personal time is ontological, “authentic,” and immeasurable. I am now, and my existence is time. The assertion “I am” is the authentic assertion of being (*Dasein*). Dasein is an entity characterized by Heidegger as “being-in-the-world,” and being-in-the-world is “being-with/for-one-another” by dialogue. Third, that I am still underway with my Dasein, which is not yet at an end. The end of my Dasein is my death, which is not some point at which a sequence of events suddenly breaks off, but the extreme possibility of itself. My Dasein is running ahead to its past, which takes everything with it into the Nothing. This past is not a “what” but a “how” of my Dasein, and it becomes visible in its everydayness. Heidegger’s last argument on time was that the fundamental phenomenon of time is, in fact, the future. The fact that time moves ahead is the authentic and singular future of one’s own Dasein. In its being the future, time comes back to its past and present. *Dasein* is time, not in time. Maintaining myself alongside my past in running ahead, I have time. Being futural as a possibility of Dasein gives time, because it is time itself. According to Heidegger, time is Dasein as temporality. Time is the “how,” not the “what.” The question “what is time?” became the question “who is time?” or perhaps “Am I my time?”

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114 Solomon, *From Hegel to Existentialism*, pp. 177-183.
117 Ibid., pp. 1-22.
For both Kant and Heidegger, time played a quite similar role in the knowing process. Heidegger’s subjectivity (Dasein) exists as “temporalizing” (Zeitigung) of time, not as a derivative of eternity.\(^{118}\) However, Heidegger’s epistemology through phenomenological immediacy was in direct contradiction to Kant’s critical idealism and the methods of physics. He developed an ontological epistemology in which the philosophical problem of a relation between subject and object was radically reinterpreted. Knowing is the “inside” mode of Dasein’s being-in-the-world. The notion of spatial relations between subject and object evaporated in his phenomenological immediacy. Heidegger also denied Kant’s principle of the irreversibility of temporal succession. The order of ordinary or “inauthentic” time, past, present, and future, was reversed in “authentic” time: future, present, and past. Ontic time runs forward, but ontological time runs backwards.\(^{119}\)

The final influential front of the battleground in Heim’s dimensional thinking was Einstein’s critical realism and Heisenberg’s quantum idealism. Heim established a scientific basis for his dimensional thinking from them, which made room for his concept of two-dimensional time. Einstein’s epistemological philosophy was based, at first, on Ernst Mach’s phenomenalism, then on Max Planck’s realism, which tried to walk a fine line between empiricism and rationalism. Mach had argued in his “criterion” of knowledge that propositions should not be retained in science if observations verifying them cannot be deduced from them. Thus, he rejected all metaphysical claims as obscurities. His world-view was anti-realistic, anti-causal, anti-mechanistic, anti-materialistic, and anti-atomistic. Einstein rejected the positivism, operationalism, and phenomenalism of Mach and shifted to the position of critical physical realism. Einstein in his GR gave primacy to sensations and promoted the use of hypothetical postulates that are not empirical or positivistic in origin. His postulates were the invariant velocity of light in a vacuum and a generalization of the principle of relativity for the cosmos. Like Planck, Einstein argued that there is a real outer world existing independently of our act of knowing, that this real outer world is not directly knowable, that the \textit{a priori} law of

\(^{119}\) See the interpretation of Heidegger in Morrison, \textit{Einstein, Kant and Tillich}, pp. 143-161.
physical causality is the provable prerequisite for the scientific endeavor, and that
metaphysics is an indispensable and inescapable subject within physics. Like Planck,
Einstein rejected the positivistic implication that sensory perceptions create the physical
world around us, and so avoided solipsism, which is the inescapable consequence of
empiricism and positivism. Thus, Einstein liberated science from the subjectivity of the
human observer.120

Based on Planck’s realism, Einstein reversed Kant’s “Copernican revolution.”
This reversal meant the return to the Leibniz’s relative notion of space and time, to
critical realism from critical idealism, and to the notion that the mind must conform to
objects rather than objects to the mind. Einstein’s Special and General theories of
relativity did not promote any kind of relativism. Rather, they sought principles of
absoluteness, invariance, and reliability. Einstein insisted that there was an
independently existing system of physical reality waiting to be discovered and described
by physicists, not only a system of “objective validity” as Kant had argued. The physical
universe exists prior to and independent of human perceptual activity. Einstein located
Kant’s categories in the physical world where at least some of them could be modified by
the results of experiments. For Einstein, physical reality was not partially created only
when the observer supplies the categories. Reality is not constituted by, or contingent
upon, human mental activities. Human beings are totally unnecessary for the cosmos to
function. Einstein’s solution to the problem of conformity between object and mind was
that our theories and categories must conform to physical objects and processes, as they
exist independently of us.121

The most important notion in Einstein’s SR was that the continuum of space-time
unites space and time in a single objective structure that exists independently of the
physical structures that move within it. The space-time continuum is a “field” for all
physical events and an inert system against which motion could be measured. Einstein
argued that if the laws of this field are covariant, that is, are not dependent on a particular
choice of coordinate systems, then the introduction of absolute space and time is no
longer necessary. That which constitutes the spatial character of reality is then simply the

120 See Morrison, Einstein, Kant and Tillich, pp. 307-312, and his note 76.
four-dimensionality of the field. According to Einstein, “there is no such thing as an empty space, i.e., a space without a field. Space-time does not claim existence on its own, but only as a structural quality of the field. I wished to show that space-time is not necessarily something to which one can ascribe a separate existence, independently of actual objects of physical reality. Physical objects are not in space, but these objects are spatially extended. In this way the concept ‘empty space’ loses its meaning.” 122 Thus, Einstein regarded physical reality as independent of the observer, and consisting of permanently existing material points in motion relative to space-time. Einstein stated that if matter were to disappear, space-time would remain as a kind of stage for possible physical events. SR removed absolute space and time, but defined new absolutes: space-time, the speed of light, and an externally and objectively real four-dimensional universe. 123

The fundamental question of Einstein’s SR and GR was the form and character of the laws of nature. His question was, were those laws of nature relative to arbitrarily chosen coordinate systems, or were they absolute? If the laws of nature are absolute, their form could not vary merely by measuring different kinds of coordinate systems, such as those of inertia, gravitation, and acceleration. If the laws of nature are relative, their form could vary in different referential situations. SR did not attempt to answer this question, but GR applies to any frame whatsoever. There are no privileged frames among inert, gravitational, or accelerating reference systems. GR is based upon the equivalence of inert and gravitational mass. These are not different components but different aspects of the same function of motion. One consequence of GR is that there is no absolute gravity, only relative gravity. GR is dependent upon the notion of matter as the cause of a field that functions as a medium for the transmission of light waves. A consequence of this field is that the notion of instantaneous or simultaneous action at a distance is impossible. The causal relation between distant events A and B cannot be regarded as simultaneous. The event B must follow event A by an interval, which is

123 Feynman, Six not-so-easy Pieces, pp. 49-71.
prescribed by the finite velocity of light in the intervening field, and by the distance between those events.\textsuperscript{124}

Einstein set forth the criterion that any definition must not be idealistic, positivistic, limited to observations, or limited to that, which can be measured at a given time. Einstein believed that an order of causality or the principle of sufficient reason was there waiting to be discovered, whether observation was or was not in progress. The epistemological law of non-contradiction was more important than laboratory experiments or metaphysical speculations based upon observation and positivistic idealism.\textsuperscript{125}

Against Einstein’s critical realism, the point of departure in Werner Heisenberg’s philosophical thinking was the epistemological impasse in theoretical physics concerning the situation established for any given experiment. It is impossible to establish strict individual causal relations empirically, and therefore science reaches its epistemological limit, its quantum boundary.\textsuperscript{126} Heisenberg’s treatment of the problem of determinism or indeterminism of microphysics was not scientific but metaphysical. He used idealistic, existential, and dialectical assumptions, and voluntaristic decisions, although he also argued that metaphysics is not tenable to physics. He optimistically believed that all contradictions could be resolved, and that an ultimate theory of physical reality was waiting to be discovered. Like Mach, Heisenberg thought that the task of physics is simply to provide a formal description of the connection between observations. Heisenberg’s focus was upon observations and upon a mathematically formal description of relations between sense data rather than upon a real physical world to which those observations refer.\textsuperscript{127}

\textsuperscript{124} Ibid., pp. 93-144. Kant had thought similarly that time had an irreversible sequence, since causes always preceded effects within a transcendental and absolute time grid, but he did not notice that the “principle of sufficient reason” presupposed the physical and cosmic field, which serves as the intermediary medium for action at a distance.

\textsuperscript{125} Morrison, \textit{Einstein, Kant and Tillich}, pp. 312-318.

\textsuperscript{126} See Werner Heisenberg, \textit{Philosophical Problems of Quantum Physics}, trans. F.C. Hayes (Woodbridge, CT: Ox Bow Press, 1979), p. 16. Heisenberg emphasized the immaterial dividing line between an observer and objects is the position in which objects are to be taken as part of the means of observation and as part of observed objects.

\textsuperscript{127} About Heisenberg’s world-view, see Morrison, \textit{Einstein, Kant and Tillich}, pp. 227-276.
Heisenberg argued based on his uncertainty principle, that the rigid law of causality is invalid in QM. He rejected causal determinism in favor of the notion of possibility and voluntarism, as Fichte had argued.\(^\text{128}\) He dismissed all contradictions within sub-atomic observations by presupposing that the sub-atomic particles do not exist continuously between observations. It is obvious that there is no contradiction arising from that which does not yet exist! Against the classical physics of Einstein, Heisenberg argued that transcendental reality precedes physical reality, but that they are complementary. He concluded that the classical description of space-time and the law of causality disappear at the quantum boundary. Because of the principle of uncertainty, there is room for the functions of indeterministic probability of neo-classical space-time. An observation changes the probability function by discontinuously selecting, from all possible and potential events, the one that actually occurs. Sub-atomic reality is somehow a discrete event.\(^\text{129}\)

The presuppositions of classical physics were that (1) the order of events in time is entirely independent of their order in space, (2) that Euclidean geometry is valid in real space, (3) that events occur in space-time independently of any observation of those events, and (4) that the act of observation had some influence on phenomena but such influence could be reduced by controlling the formulations of experiments. Einstein’s SR and GR rejected the first assumption, whereas QM rejected the third. Heisenberg modified these assumptions of classical physics by arguing that the principles of bivalence and causality are not valid in quantum logic and in the ontology of QM. Atoms constitute a discontinuous indeterministic world of coexistent non-objectifiable potentialities and possibilities. Matter was dematerialized.\(^\text{130}\)

In Heisenberg’s worldpicture lies an insurmountable conflict between materialism and idealism. Heisenberg claimed that it is scientifically necessary to shift from materialism to idealism. According to his ontology, reality consists of three layers.

\(^\text{128}\) Heisenberg, *Philosophical Problems of Quantum Physics*, p. 27-28: “The observation of nature by man shows here a close analogy to the individual act of perception which one can, like Fichte, accept as a process of Self-limitation of the ego. It means that in every act of perception we select one of the infinite number of possibilities and thus we also limit the number of possibilities for the future.”


\(^\text{130}\) According to Jaki, *Limits*, p. 95, “Heisenberg (and Bohr) claimed that the uncertainty principle definitely discredited the principle of causality… that physicist can literally create matter out of nothing.”
The primordial energetic layer of reality is located in, and constituted by, mathematical and objective idealism. The so-called “central order” of this layer gives non-physical and non-material meaning for the whole world. The intermediate layer is that of energetic possibility or potentiality toward an actual occurrence. The third is the objective, macroscopic, physical, and material layer of nature. The second and third layers are derivative, contingent, transient, and relative to the first layer, which is absolute, eternal, and supernatural. Heisenberg thus rejected the ontic position of the critical physical realism of Einstein and shifted to the ontological positions of Platonic idealism and to the existentialism of Heidegger.¹³¹

Chapter II

BASIC CONCEPTS OF HEIM’S DIMENSIONAL THINKING

Karl Heim’s dimensional thinking was influenced by the philosophies analyzed in the previous Chapter I.2. However, it was not any combination or decisively dependent on their epistemological or ontological thoughts. Heim created his brilliant ontological theory of reality on the foundation of those philosophies, but at same time, he also rethought them and rejected their fatal flaws.

Heim’s purpose in the first of his six-volume work, *Glaube und Denken*, was to create an unambiguous conceptual foundation common to science, philosophy, and theology. He emphasized the point that his task was a phenomenological one in the sense of Husserl’s phenomenology. He thus “bracketed” epistemological questions about reality, but argued that his dimensional thinking provided solutions also to epistemological problems. He argued that his “philosophy of spaces” (*Philosophie der Räume*) was an endeavor to expand Kant’s pure forms of intuition: space and time. ¹

Heim made assertions that claimed to describe reality as it is “given.” He emphasized that his task was ontological rather than epistemological, and that his worldview did not necessarily presuppose any stance, idealistic or realistic, to reality. He believed that on this foundation, the simultaneity of God’s transcendence and immanence could be understood by differently thinking people. On the other hand, Heim’s endeavor was not only ontological but also epistemological, because Heim had to ask how it is possible to know anything about reality. Epistemology is as fundamental as ontology in

Heim’s dimensional thinking, although ontology takes priority. Without answers to epistemological questions, Heim’s system has a structure but no purpose.

In the fourth of his six-volume work, *Der christliche Gottesglaube und die Naturwissenschaft*, Heim sought to create a scientific foundation for the consonance between theology and natural science. In his ontological analysis of reality, Heim tried to combine both Kant’s transcendental idealism and Einstein’s critical physical realism by using the phenomenological method of Husserl and the existentialism of Heidegger. In these two volumes of Heim’s work, the basic concepts Heim used to describe reality are “space,” “boundary,” and “polarity.”

1. Space

In the introduction to his philosophy of spaces, Heim outlined the problems of defining space in the history of physics. Then he defined his own concept of it, classified types of spaces, and finally explained the principle of their openings, in other words, how it is possible to become conscious about spaces or know their existence.

A. Space-problem from Newton to Quantum mechanics

In order to escape the relativity, pluralism, contingency, and incompleteness of empirically known space, Sir Isaac Newton postulated an infinite and absolute space and time, identified them with God, and gave them independent metaphysical existence as God’s manifestation, God’s “sensorium” or aspects, in which God was immanent in nature. He explained: “Absolute, real, and mathematical time has naturally no relation to the external world and it flows equably. Absolute space, which has naturally no relation

2 *GD*, pp. 49-51. “Supra-polarity” could be seen as the fourth basic concept, but in this dissertation, I argue that “polarity” exists within “supra-polarity” and they are reverse sides of reality, because of two-dimensional time.

to the material world, is always the same and motionless.” In addition, space is homogeneous and Euclidean, which means that it must be perfect. Newton believed that he could empirically prove the existence of this kind absolute space. Absolute space was an imperceptible container that eliminated relativity from nature and consequently from science. His famous laws of motion, however, did not coincide with his ideas of absolute, objective, and infinite space. The fact that absolute rest does not exist meant that one could not give an event an absolute position in space, as had been believed since Aristotle. The classical principle of relativity argues that the laws of mechanics and the phenomena deduced from them are identical whichever coordinate systems are used.Newton was worried by this lack of the absolute position, or absolute space, because it did not agree with his idea of an absolute God. Therefore, he argued that space must be absolute and infinite, even though it contradicted his laws of motion. Newton’s concept of absolute space was based upon a synthesis of two heterogeneous elements. One of these elements came from the scholastic notion of “substance-accident,” and the other element involved ideas that identified space as an attribute of God.

Gottfried Wilhelm Leibniz argued against Newton’s notion of space that empty absolute space is an abstraction, because dimension without dimensions is an attribute without subject. Space and time were notions that arose from our ways of relating phenomena. Therefore, space and time cannot be absolute but relative. In fact, for Leibniz, space and time were unreal, although references to spatial location and temporal duration provided a convenient shorthand for keeping track of the relations among the consistent set of monads that make up the actual world.

5 See Hawking, A Brief History of Time, p. 28, and Jammer, Concepts of Space, pp. 2-3. George Berkeley, who believed that all material objects, space, and time are illusions, opposed Newton. See his Treatise Concerning the Principles of Human Knowledge (1710). Richard Bentley had argued against Newton in 1692 that in an infinite, homogeneous universe of stars the net effect of gravitational pull is zero because its pull is the same in every direction. This is the so-called gravitational paradox of an infinite universe. Therefore, the universe, which obeys the inverse square law of gravitation, must be finite. Newton himself emphatically stated that the universe is finite in an infinite space. See Jaki, God and Cosmologists, pp. 5-6.
Immanuel Kant embraced, as we have seen in the previous chapter, Newtonian
corcepts of space and time, but he justified them in a new way. According to Kant, space
and time were not objectively real entities, or substances, or accidents, or relations, but
pure forms of intuition *a priori*. Thus, space was not an empirical concept that could be
found by reasoning *a posteriori*. For Kant, the only logically possible geometry,
Euclidean, was not empirical, but purely rational.\(^7\)

Euclidean space is mathematically founded on the axiom of parallel. According
to it, through a point outside a given line it is possible to draw only one line parallel to the
given line. It is possible logically to deduce all geometrical sentences from this postulate,
but the postulate itself is unproved. For many centuries, mathematicians believed that
this postulate could be proved based on the remaining postulates, but all efforts to
discover such a proof proved fruitless. In the 1820s the German mathematician Carl
Friedrich Gauss, the Russian mathematician Nikolay Ivanovich Lobachevsky, and the
Hungarian mathematician János Bolyai independently demonstrated a non-Euclidean
geometry, in which Euclid’s postulate was replaced by a postulate stating that through
any point not on a given straight line an infinite number of parallels to the given line
could be drawn. Although this hyperbolic non-Euclidean geometry is not viewable, it is,
nevertheless, mathematically possible, true, and more general than the Euclidean
geometry, which is its borderline case.\(^8\)

Later, the German mathematician Georg Friedrich Bernhard Riemann showed that
a geometry in which no parallel lines occurred, was possible. Riemann did not start from
the axiom of parallel, but from the theory of surfaces of Gauss, in which two-dimensional
surfaces are examined in three-dimensional space. Riemann’s elliptic, non-Euclidean,
geometry was the geometry of the surface of a sphere in which all straight lines are so
called “great circles.” It is impossible to draw any pair of parallel lines on this surface.
For example, the three-dimensional surface of a ball could be examined as two-

\(^7\) Cassirer, *Kant’s Life and Thought*, pp. 39-57.
\(^8\) According to Reichenbach, *Space & Time*, pp. 1-107, in fact, there is not only one non-Euclidean
gometry but also an infinite group of non-Euclidean geometries and corresponding spaces, whose
structure depends on the value of the constant k. If the constant k grows infinitely in the sentence \(\pi k (e^{\sqrt{k}} - e^{-\sqrt{k}}) = 2\pi + \{\pi k^3 / 3 (k/k)^3 + \ldots\}\), then its boundary case is the sentence of Euclidean geometry: \(2\pi\).
dimensional space in which the distance between two points is not a straight line, as in Euclidean geometry, but the straightest line. These lines are the great circles of the ball.9

For comparatively small distances, Euclidean geometry and non-Euclidean geometry are essentially equivalent. However, in dealing with astronomical space, non-Euclidean geometry gives a more precise explanation of observed phenomena than does Euclidean geometry. According to Riemann’s concept of “metric space,” it is possible to think of n-dimensional spaces, and that every space includes an infinite number of internally different spaces. These differ from each other only in curvature. The curvature of two-dimensional Euclidean space is 0, and therefore the axiom of parallel- is valid in it.10

In the spaces of Riemann, the curvature is constant and positive. This kind of space is elliptic; for example, the surface of a ball, in which parallel lines cannot be drawn through a point outside a given line. All lines always cross each other, and the sum of angles in triangle is always bigger than 180°. In the spaces of Lobachevsky and Bolyai, the curvature is constant, but negative. This kind of space is hyperbolic, in which more than one parallel line can be drawn through a point outside a given line, and the sum of angles in a triangle is always smaller than 180°. All these spaces are mathematically equally true. The concept of the three-dimensional non-Euclidean space nullified the mathematical twilight, which had been characteristic for all attempts to solve the problem of space in physics. Under Riemann’s direction, the details in the structure of space began to take form.11

The starting point of Albert Einstein’s SR was not the concept of space, but concept of time.12 Einstein’s time was not absolute and mathematical, as Newton had supposed, but instead relative and physical. Time was dependent on the motion of an observer. The principle of invariance of the velocity of light in a vacuum (c=299,292.7

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9 According to Rolf Nevanlinna, Suhteellisuusteorian periaatteet (Porvoo: WSOY, 1964), pp. 97-98, the curve, which has this minimum quality, is so called “geodesis.” It is the straight line from the point of view of this surface. From the curves L between two points p1 and p2 is the shortest that L, whose length

\[ \int_{L} ds \] receives the minimum value, when \[ ds = + \sqrt{G(p)} \, dx \, dy. \]

10 Before Riemann, another German mathematician, Grassmann (1809-1877) had proved that Euclidean three-dimensional space was not the only logically possible Euclidean space. All Euclidean n-dimensional spaces exist equally, no matter what the value of n is.

11 About Lobatschewsky and Bolyai, see Reichenbach, Space & Time, pp.3, 5, 49-57, 88.

12 About Einstein’s Special Relativity, see Feynman, Six not-so-easy Pieces, pp. 49-71.
km/s or 185,971.8 mi/s), and its independence from the motion of the observer, was inconsistent with absolute time. The fundamental postulate of the theory of relativity was James Clerk Maxwell’s equation that the laws of science should be the same for all freely moving observers, no matter what their speed is. Einstein extended the idea to the velocity of light: all observers should measure the same speed of light, no matter how fast they are moving. The concept of absolute simultaneity of events at different places has no physical meaning, because the velocity of the fastest signals (light) is the same for all observers, irrespective of their motion. This idea of equivalence of all inertial system constituted the notion that Einstein designated as the special principle of relativity.

Einstein SR was based on a theory of Henrik Antoon Lorentz. If Galileo’s equations of transformation are changed to Lorentz’s equations of transformation, from these equations follow, that the measuring instrument contracts when moving in the direction of the motion (the so-called “Lorentz’s contraction”), and the moving distance of time is dilated (time dilation). In space as defined by Einstein’s SR, however, there were two limitations. The first limitation of SR was that there were no constant scales of measurement, which was the basic condition of a mathematical theory of space. The second limitation of SR was that it was only the theory of motion through space. In addition, SR does not prove the non-existence of Newton’s absolute space, although Einstein so believed.13

The Russian mathematician, Hermann Minkowski, developed the concept of the space-time continuum in 1908. He established an adequate mathematical foundation for Einstein’s theory. To the three dimensions of space, he added the concept of a fourth dimension, time (t = √ - c^2). The concept of absolute and mathematical space and time,

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13 In 1-dimensional physical coordinates K (x, t) and K' (x', t'), in which t=t' (absolute time) and K' moves in constant speed v in relation to K, Galileo’s transformations are: (1) x' = x-vt and x = x'+vt. Lorenz-transformations, which are grounded on the constancy of the velocity of light, are: (2) x' = __1____ (x-vt) and t =____1____ (t– (v / c^2)x .
\[ \sqrt{1-v^2/c^2} \]
\[ \sqrt{1-v^2/c^2} \]

If the velocity v is very slow in comparison to c, and x is not very big, Galileo’s transformations are valid. The classical mechanics is so the boundary case of the special theory of relativity. See Nevanlinna, *Suhteellisuusteoria*, pp. 186-201. According to Lehti, “The Concept of Space in Relativity Theory and Cosmology,” in *ICD*, pp. 2-5, if we accepts equations (2) as more correct than equations (1), then the supposition of absolute time leads to the supposition of absolute space. Either all “times” and all “spaces” are equivalent or there exists a preferred time and a preferred space. Lorentz saw absolute time and absolute space as meaningful concepts and thus supported the “conspiracy theory of natural laws”; as also Galileo and Newton had done.
as separated from each other, was replaced by the concept of the new absolute: Minkowski’s continuum of four-dimensional space-time. In it, space and time were coordinates, where every point represents an “event.” What happened was that Minkowski transferred the subject from the realm of physics into that of mathematics. This concept developed from Einstein’s SR (1905), became, in turn, the framework for Einstein’s GR (1915).\textsuperscript{14}

The most important consequence of GR was Einstein’s law of the equivalence of mass (m) and energy (E), expressed by the famous equation $E = mc^2$, in which $c$ is the velocity of light.\textsuperscript{15} This law, first regarded as a matter of mainly philosophical interest, later turned out to have immense practical implications. Einstein extended relativity to accelerated systems, and he developed a field theory of gravitation that contained Newton’s theory as its approximation case. The explanation starts from the curvature of the continuum of space-time by the distribution of mass and energy in it. The gravitational field is identical with the continuum of space-time in every point of the universe and with the function of matter. Therefore, gravity as acceleration depends on the curvature of space-time, and mass tells space-time how to curve, and space-time tells mass how to move. GR suggests, for example, the existence of “black holes” and that the universe must have a beginning and, possibly, an end.\textsuperscript{16}

The development of quantum theory began with Max Planck’s proposal in 1900 that matter can emit or absorb energy only in small, discrete packets called “quanta.” This idea introduced the particle nature of light. In 1905, Einstein used Planck’s work to

\textsuperscript{14} The four-dimensional space of Minkowski is pseudo-Euclidean, which means that it can be changed to Euclidean by doing a “Wick rotation”: writing the distance of two space-time points as a finite difference and as an infinitesimal difference. Only when the continuum is a Euclidean one, is it possible to associate the co-ordinates $x_1…x_4$ with the points of the continuum so that we have simply: $d^2 = dx_1^2 + dx_2^2 + dx_3^2 + dx_4^2$. Einstein, \textit{Relativity}, pp. 96-100. According to Lehti, “The Concept of Space in Relativity Theory and Cosmology,” in ICD, pp. 7-9, Minkowski’s shift from physics to mathematics means that his theory and reality are not necessarily correspondent.

\textsuperscript{15} Max Born, “Physics,” p. 3.

\textsuperscript{16} The special theory of relativity applied to non-gravitational fields. In the general theory of relativity the Gaussian co-ordinates is: $ds^2 = g_{11}dx^2 + g_{22}dy^2 + g_{33}dz^2 + g_{44}dt^2 + 2g_{12}dxdy + 2g_{23}dydz + 2g_{13}dxdz + 2g_{14}dxdt + 2g_{24}dydt + 2g_{34}dzdt$, when the motion of measurer in connection to measured is accelerating. Matter determines the metrics of space, and inversely, the metrics of space determines motions of matter in space. See Hawking, \textit{A Brief History of Time}, p. 44. According to Lehti, “The Concept of Space in Relativity Theory and Cosmology,” in ICD, pp. 9-11, SR and GR does not necessarily disprove a unique or “absolute” system of reference provided by nature itself. Absolute time, space, and motion are accepted in fact at contemporary cosmology. Absolute space-time is a hypersurface in the homogeneous universe.
explain the photoelectric effect, in which light hitting metal makes the metal emit electrons. Ernest Rutherford proved that atoms consisted of electrons bound to a nucleus in 1911. In 1913, Niels Bohr proposed that classical mechanics could not explain the structure of the atom and developed a model of the atom with electrons in fixed orbits. In 1924, Louis de Broglie suggested that matter could be described as a wave, just as light could be described as a particle. The wave model of the electron allowed Erwin Schrödinger in 1925 to develop a mathematical method of determining the wave function, and Max Born suggested that this should be interpreted as a probability amplitude that an electron will be at a particular place at a certain time. In the same period, Werner Heisenberg developed Schrödinger’s theory of wave function in a different formalism, called “matrix mechanics.” Wolfgang Pauli developed his “exclusion principle,” which allowed physicists to calculate the structure of a quantum atom for the first time. In 1926 Heisenberg, Born, and Ernest Pascual Jordan published a theory that combined the principles of quantum theory with the classical theory of light, called “electrodynamics.” The next year Heisenberg made another important contribution to quantum theory, when he introduced his “uncertainty principle.” In 1928, Paul Dirac combined quantum theory with electrodynamics. He formulated a relativistic theory of the electron that was consistent with both QM and Einstein’s SR. The various aspects of his theory led to the development of a theory that came to be known as “quantum electrodynamics” (QED). In the early 1950s Shinichiro Tomonaga, Richard Feynman, and Julian Schwinger each independently demonstrated that QED successfully predicted or explained the results of many experiments.17

According to QM, space is a discrete form of energy. A particle can be delocalized, it can be simultaneously in several energy states, and it can even have several different identities at once. This schizophrenic behavior is encoded in its wave function, which can always be written as a superposition of quantum states, each characterized by a complex probability amplitude. Broglie, applying the principles of relativity, showed that not only do waves behave like particles, but also particles behave like waves (wave-particle duality or complementarity). To our senses, no macroscopic

objects could be both waves and particles. Therefore, the central problem of physics was to formulate a logically consistent theory that would eliminate the entanglement of the particle and wave aspects of light and matter. QM included classical mechanics as a limiting case and preserved some of its formulas, but differed profoundly from it by being essentially statistical and indeterminate. It gives exact answers to many questions, but it can only give probabilities for some values. Heisenberg formulated these features in his uncertainty principle. Quantum mechanical equations show that accurate measurement of both the position and the momentum of a subatomic particle at the same time cannot be possible. This uncertainty does not result from clumsy instruments or inadequate observational techniques. Instead, it seems that at the core of reality must be indeterminate, an unfathomable mystery that cannot be overcome.  

Physicists have been then aware of a dark cloud looming on the horizon. There are two pillars upon which modern physics rests: GR and QM. GR provides a theoretical framework for understanding the universe on the largest of scales. QM provides a theoretical framework for understanding the universe on the smallest of scales. However, the two theories underlying the marvelous progress of physics during the last hundred years, as they are formulated, cannot both be right. They are mutually incompatible. During the last thirty years of his life, Einstein tried to solve this dilemma. He searched passionately for a so-called “unified field theory,” which would be capable of describing all of nature’s forces within a single, all-encompassing, and coherent framework. He failed, and since then, all attempts to merge these two theories have failed.

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18 Mathematically, the uncertainty principle can be written as: $\Delta x \Delta p > h/4\pi$. $\Delta x =$ the uncertainty in position times $\Delta p =$ the uncertainty in momentum must be greater than a constant number equal to Planck’s constant $h$ divided by $4\pi (n)$ is a constant equal to $3.14$ or $\pi$). This principle means that as a scientist measures a particle’s position increasingly accurately- so the uncertainty in its position becomes very small- the uncertainty in its momentum grows larger. Likewise, if the uncertainty in momentum is reduced, the uncertainty in position grows larger. Eino Kaila, “Zur Metatheorie der Quantenmechanik,” in Acta Philosophica Fennica, V (1950), pp. 123-131. According to Jaki, Is There a Universe? pp. 48-49, argued, “it is a non-sequitur to claim that if an interaction cannot be measured exactly, it cannot take place exactly. The principle of indeterminacy should rather been called the principle of imprecision.”

B. Heim’s Definitions of Space

Heim knew well the development of the problem of space-time in physics. He often participated in discussions about its consequences for philosophy and theology. Heim witnessed breakthroughs in thermodynamics, SR and GR, and QM. It seems that he was also aware of the biggest dilemma in modern physics, the incompatibility of GR and QM, and, in fact, with his dimensional thinking, he proposed a solution to this problem.

According to Heim, (1) space is in itself a limitless continuum in which it is possible to carry out distinctions of contents according to principle of order of its structure. These kinds of limitless and infinite spaces are distinct dimensionally from each other. Thus, space is not a container that could be opened from outside, but it is entirely open and without any kinds of material walls. (2) Space is an in itself infinite continuum, in which according to a certain rule of the structure, a variety of contents is ordered. Every one of these spaces is a limitless continuum. Thus, space is both limitless and/or an infinite continuum. Heim’s definitions of space could be explained logically by the following equations:

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20 According to Horst Beck, Götztendümmerung, pp. 49-51, Einstein had said that Heim was one of the three persons who understood his theories of relativity, and made correct deductions from them. See also Timm, Glaube und Naturwissenschaft, pp. 8, 50, and Krause, Theologie, Physik und Philosophie, p. 31.


23 The formula of the explicit definition is A= def. B, where A is the definiendum and B the definiens. The formula’s criteria are the following: (1) B must be equivalent with A. (2) B must not directly or indirectly include A, which means, the definition must not be circular. (3) B must not include negative terms. (4) B must not be explained in figurative or obscure language. See Cohen & Nagel, An Introduction to Logic and Scientific Method, pp. 238-241, and Patrick Suppes, Introduction to Logic (New York: Van Nostrand Reinhold, 1969), pp. 151-161. An inadequate definition is too large or limited, or simultaneously too large and too limited. Heim’s definitions of space meet the criteria, but if the latter is true, the former is too limited. Both definitions together do not meet criteria (1) and (4), because they denote different things. Heim did not draw a distinction between the astrophysical space, which a posteriori is finite and limitless,
(1) \( S_1 = \text{def.} (x) (fx \& hx) \), and

(2) \( S_2 = \text{def.} (x) (gx \& hx) \), where \( f = \text{limitless in self} \), \( g = \text{infinite in self} \), and \( h = \text{continuum} \).

According to Heim, the qualities of \( f \) and \( g \) are:

(1) Relevant: \( f \land g = \text{def.} (\exists x) (x \supset f \& x \supset g) \), which means that there is a real space, which includes both qualities as its characteristic features.

(2) Relational: \( (g \supset f) \& \sim (f \supset g) \).\(^{24}\)

In his definitions of space, Heim used the concepts of the mathematical sets, such as “infinite,” “finite,” and “continuum.” However, he argued that it is impossible to describe all existing spaces with the help of the mathematical sets. For example, how can the “space of bees” be described by human mathematics? We can know that the bees live with us in four-dimensional reality but they live also in panpsychic reality, which is unknown to us. There is only a way to become conscious about the different kinds of spaces: we must exist in that space or dimension.\(^{25}\)

Heim also emphasized, that his endeavor was only to expand Kant’s forms of intuition, because Kant’s simple and invalid scheme of these forms and of categories of senses cannot map the complexity of the experienced world.\(^{26}\) As was discussed above, Kant tried to prove the necessity and a priori form of the concepts of space and time, and that space and time are intuitions (Anschauung). He concluded that space and time are nothing more than intuited forms in our senses.\(^{27}\) Kant’s scheme applies only to three-dimensional and Euclidean space, whereas Heim’s concept of space includes all kinds of possible spaces: n-dimensional Euclidean and non-Euclidean. Moreover, Kant’s space

and the mathematical space, which a priori is infinite. If Heim used “infinite” and “limitless” in the same meaning, which is presumable, there are no mathematical contradictions, because in mathematics, “infinite” and “limitless” are synonyms. See Rudy Rucker, Infinity and the Mind. The Science and Philosophy of the Infinity (Princeton, New Jersey: Princeton University Press, 1995), pp. 1-52.

\(^{24}\) R. Kauppi, “Intentionaalisen logiikan ongelma,” in Ajatus XIX (1956), pp. 102-103. However, if definition (1) and (2) are different, \( f \) and \( g \) are: Irrelevant: \( f \lor g = \text{def.} \sim (\exists x) (x \supset f \& x \supset g) \).

\(^{25}\) GD, pp. 31-32. “Dimension” is also a mathematical term. Hence, it is only by an analogous extension of the meaning of the term that Heim can speak about non-mathematical dimensions of space.

\(^{26}\) GD, p. 34.

and time are forms of intuition only, whereas Heim’s space and time are both physical and eternal.\textsuperscript{28} Heim argued, based on Einstein’s GR, that space and time are inseparable from matter, that is, physical reality.\textsuperscript{29}

\textbf{C. Types of Spaces and their Openings}

Heim defined four different types of spaces, which fulfill his ideas of spaces:\textsuperscript{30}

1. A space can be such that it is possible to illustrate and geometrically describe it. This kind of space includes one-dimensional physical time (\textit{Zeit-Raum}),\textsuperscript{31} two-dimensional surfaces (\textit{Flächen-Raum}), and three-dimensional, Euclidean space of things or it-space (\textit{Körper-Raum} or \textit{Es-Raum}). This type of space is physical.

2. A space can be such that it is impossible to illustrate it but one can intuitively imagine and mathematically describe it. Examples of such a space are, for example, Riemannian n-dimensional spaces. This type is purely mathematical.

3. A space can be such that it is impossible to describe it geometrically, because it is outside physical reality. Examples of such spaces include I-space (\textit{Ich-Raum}), Thou-space (\textit{Du-Raum}), and the existential meeting of I-Thou (\textit{Ich-Du-Raum}), which are non-objectifiable. This type is psychic or conscious. In fact, the mind or self is the second dimension of time or, at least, the mind exists in the second dimension of time, which is non-objectifiable, existential, \textit{nunc aeternum}. (4) A space can be such that it is not possible to describe it mathematically or experience it existentially, because, \textit{analogia entis}, it is possible to imagine that there are beings who live in such spaces that are closed for us. For example, the worlds of animals, plants, and

\textsuperscript{28} \textit{GD}, p. 34.
\textsuperscript{29} “Diese Räume sind, wenn wir sie im Sinne der Kantischen Philosophie deuten, zu Anschauungsformen geworden, die potentiell als objective Möglichkeiten in der Wirklichkeit enthalten sind. In diesem Sinne gehören diese raumzeitlichen Anschauungsformen mit der Materie unzertrennlich zusammen. Sie können aber nur realisiert werden, wenn bewusste Wesen da sind, die in bestimmten Räumen leben.” \textit{WaW}, p. 107.
\textsuperscript{30} \textit{GN}, pp. 134-145.
\textsuperscript{31} It is, however, necessary to remember that Heim’s concept of time is two-dimensional. Its one dimension is physical and temporal, and its other dimension is existential and eternal.
microphysical entities (the quantum world) are spaces of this kind. This type of space is panpsychic. 32

Because the spaces of every type are limitless and infinite, the answer to the question of how can we know that a space exists beyond another space is crucial. According to Heim, the answer is that the new space opens to us in the same way that we can move from a Euclidean space to a non-Euclidean space. When a space, where we have existed without knowing it, opens to us, its principle of order is immediately familiar and as universally applicable as the axiom of parallel in Euclidean geometry. The distinctive feature of this opening of a new space is a “paradox”: contradictory and impossible things of the old space are possible in the new space. 33

Heim explains this interdimensional “mystery” by using the metaphors of Edwin A. Abbot. 34 Let us suppose that there is a being who is conscious only about a mathematical point. It exists in a space, where there is no dimension. Beyond the point, there is nothing. If this point moves, a line will be formed. It is the one-dimensional space, “Lineland.” The being in Lineland is conscious only about consecutive relations. If the line moves sideways, a surface will be formed. It is two-dimensional space, “Flatland.” The beings of the Flatland are flat, their shapes are geometric objects, and they are conscious only about consecutive and horizontal relations.

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32 Generally, the correct division must fulfill conditions: (1) it must be perfect, (2) the constitutive features of the concept must exclude each other, (3) it must be grounded on only one principle (fundamentum divisionis). See Cohen & Nagel, An Introduction, pp. 241-244. It is clear that Heim’s divisions do not fulfill condition (3), because there are different kinds of principles of order and structural laws as bases of division, and they do not fulfill condition (2), because Heim’s spaces do not exclude each other but cross each other.

33 GD, pp. 32, 53, 57.

34 Edwin A. Abbot, Flatland: A Romance of Many Dimensions by a Square, originally published in 1884 and reprinted in New York: Signet, 1984. There are many similar metaphors of interdimensionality. The Christian spiritualist A.T. Schofield, in his book Another World (1888), argued that God and the spirits resided in the fourth dimension. Heim refers to this book in his GD (1931), p. 50. In 1893, the theologian Arthur Willink wrote The World of the Unseen, in which he claimed that it was unworthy of God to reside in the lowly fourth dimension. He claimed that the only domain magnificent enough for God was infinite-dimensional space. Oscar Wilde, in his book The Canterville Ghost (1891), supposed the four-dimensional space as place to escape. H.G.Wells, in his book The Time Machine (1894), popularized a new idea in science that the fourth dimension might also be viewed as time, not necessarily space. The earliest speculation of time as the fourth dimension was in the article “Dimension” (1754) by Jean d’Alembert. Wells, in his book The Invisible Man, knew that a man could become invisible if he could somehow leap into the fourth dimension. See M. Kaku, Hyperspace, pp. 55-62.
In Abbot’s story, Mr. Square was living in Flatland. Discussion of the third dimension was strictly forbidden. Anyone mentioning it was sentenced to severe punishment. One day, however, his life was permanently turned upside down when a mysterious Lord Sphere, a three-dimensional being, met him. It appeared to Mr. Square as a circle that could magically change size. Mr. Square could not understand the experience before he had a chance to make a trip to Spaceland. It was a fantastic, almost mystical experience, which changed his “common sense” life.

If a surface rotated vertically, a cube formed. The cube is the three-dimensional space, “Spaceland.” The inhabitants of Spaceland, human beings, are conscious of the consecutive, horizontal, and vertical relations. In this way, we have moved from the point to the line, from the line to the surface, from the surface to the space, always in the same analogical way. However, there is no reason to stop here. The same type of manipulation could continue. If a cube rotates in a certain way, a four-dimensional space will be formed, where eight corners of the cube correspond to the sixteen corners, and its six side-squares correspond to the eight cubes of the new hyperspace. If this space rotates in an analogous way, a five-dimensional space will be formed, and so on infinitely. Kant’s three-dimensional and Euclidean space is, therefore, only a special space among all possible spaces.35

Heim’s interpretation of Abbot’s metaphors corresponds only to types (1) and (2) of spaces discussed above. However, Heim presupposed that the same analogous method could be applied also to type (3) and (4), because moving from objectifiable space to non-objectifiable space is as easy as the manipulation in mathematics. However, the opening of a new space does not happen actively but always passively as a gift. The opening of a new space is like the turning upside down experience of Mr. Square in Flatland. The new space has always existed but we could not be conscious of it before its opening, although

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35 The construction of spaces analogically is the accepted method in mathematics. Analytical geometry uses this method for constructing n-dimensional Euclidean or non-Euclidian systems. For usual perception, the number three is the insurmountable limit, but in analytical geometry, the move from three to four dimensions is as easy as from two to three dimensions. However, four-dimensional space of the theory of relativity is not interpreted geometrically but physically. Helmholtz had proved that we could intuitively represent non-Euclidean spaces. He thus showed that Euclidean geometry is not necessity of intuition, as Kant had argued. See Nevanlinna, Suhteellisuusteoria, pp. 107-121, and Coffa, Semantic Tradition from Kant to Carnap, pp. 47-61.
we have always existed within it. From the vantage point of the new dimension, one can look “down” and see reality in a new broad perspective. 36

2. Boundary

The second basic concept in Heim’s dimensional thinking is “boundary” (Grenze). Heim did not use this concept in his earlier thinking at all. Instead, he used concept of “distinction” in the same meaning as his subsequent concept of “boundary.” There were two different kinds of distinctions: an elementary or first-grade distinction and the paradoxal or second-grade distinction. The former distinction is between a space and its contents, and the latter distinction between spaces. Heim also used the concept of “relation” similarly. There are two kinds of relations: disjunctive (either-or) and conjunctive (both-and). 37 Heim defined only the mathematical concept of boundary. According to his definition, in differential geometry, the straight line is tangent to the circle at a point, which means that the straight line and the circle touch each other at that point. The circle and the tangent have one mutual point, through which could be drawn infinitely many straight lines and circles. The circle and the tangent are in a disjunctive relation in that point. If the radius of the circle grows infinitely, then the circle and its tangent combine. The circle is a straight line, with an infinite radius, and the straight line is a circle with an infinite radius, and these parallels cut each other in an infinitely far point. Thus, the circle and the straight line are also in a conjunctive relation. Heim argued that this mathematical proposition is valid in the continuum of space-time or between two perspective center-points, and the proposition is the indirect proof of the non-objectifiable. 38

36 GN, pp. 134-145. A similar opening of a new space or dimension happens by going through a “wormhole.” Using such a wormhole, one can, in theory, warp drive, leap across light-years of space, and go faster than the speed of light without violating relativity. An Oxford mathematician, Lewis Carroll discovered this bizarre possibility 100 years ago, and Einstein’s theories of relativity have proved it. See Kaku, Hyperspace, pp. 339-341.
37 GD (1931), pp. 50-76.
A. Heim’s Definitions of Boundary

According to Heim, there are two different kinds of boundaries in all relations of intra-mundane transcendence: the boundary of content, and the boundary of dimension. These boundaries are similar for both idealists and realists. They are not dependent on epistemological opinions about reality at all, because their character is ontological. The boundary of content prevails between two or more mathematical, physical, or phenomenal entities within one and the same space, and it is objectifiable. The boundary of dimension prevails between two or more limitless and infinite spaces. In fact, the physically interpreted dimensional boundary is the velocity of light between spaces.\(^{39}\)

B. The Boundary of Content

Heim’s examples about the objectifiable boundary of content concern mathematical or physical entities and phenomena. However, Heim does not clearly distinguish mathematical (m), physical (f), and phenomenal (φ) languages.\(^{40}\)

In a one-dimensional mathematical space, the boundary is a point, which divides any straight line into two parts. In one-dimensional and physical time-space, the boundary is a moment or a point in time that divides time into the past and future. In

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\(^{39}\) *GD*, pp. 46, 49. Heim’s defined the boundaries: “…die beiden Dinge sich in einem gemeinsamen Raum befinden, den sie miteinander teilen müssen, und daß innerhalb dieses Raumes das eine Ding den Raum einschränkt, der dem andern Ding zur Verfügung steht. Wir wollen dieses Verhältnis die *inhaltliche Grenze* nennen, weil es sich um eine Beziehung handelt, in der Inhalte eines desselben Raums zueinander stehen.” “Eine völlig andere Art der Begrenzung findet statt, wenn zum Beispiel eine Ebene da ist, die in sich unendlich ist, und außerdem eine zweite Ebene, die ebenfalls grenzenlos ist, die aber in einem Winkel gegen die erste Ebene geneigt ist…jede der beiden Ebenen, nachdem sie sich in der Schnittlinie begegnet sind, ungestört ins Unendliche weiter. Beide behalten also nach wie vor ihren grenzenlosen Charakter. Und doch grenzen sie sich gegeneinander ab. Wir wollen diese zweite Art der Begrenzung im Unterschied von inhaltlichen Grenze die *dimensionalen* Grenze nennen, weil wir sie in den Dimensionen des Raums am anschaulichsten vor uns haben.” *GD*, pp. 52-53. However, according to Rucker, *Infinity and the Mind*, pp. 31-32, there is no boundary, for example, in a finite circle, the surface of a ball, or hyper-ball, which is our astro-physical universe.

one-dimensional and phenomenal time-space, for example, between two sounds, the boundary is a point at which the one sound ends and the other begins.\textsuperscript{41}

In two-dimensional mathematical space, the boundary is a one-dimensional line, which cuts the plane in two. In two-dimensional physical space, for example, between two countries on the globe, the boundary is a borderline. In three-dimensional mathematical space, the boundary is a two-dimensional plane that cuts the body into two segments. In three-dimensional physical space, for example between two rooms, the boundary is a wall.

Heim gave many trivial examples about the boundary of content, and it is possible to continue them infinitely, but all of them are only about mathematical spaces. For example, in four-dimensional mathematical space, the boundary is a three-dimensional body. If the number of the dimensions in a space is (n), the number of the dimensions in the boundary is (n-1). There is a limitation in Heim’s examples, namely, all his examples represent only types (1) and (2) of the spaces argued above. Heim did not give examples about the boundary of content in phenomenal spaces, even though his definitions theoretically include these also. Further, Heim noted the existence of the boundary of content in different cases, but he did not direct attention to its form. In mathematical spaces, the form of a boundary could be a point, a line, a plane, a body, and so on. In physical spaces, it could be a “dimensional” point, line, plane, or body. In the phenomenal spaces, it is always a “temporal” duration, because psychic events are dimensional in time.\textsuperscript{42}

\textsuperscript{41} Because Heim did not distinguish f- and φ-languages, he thought that the phenomenal moment is a point. However, it has been known that the phenomenal moment has the duration of between 0.4 and 3.0 seconds. The phenomenal difference of this succession and structure of hearing or “gestalt” is clear. There are two possibilities: A is audible but B is not yet. Then B is audible but not A. This is Heim’s example. Or, AB is audible (the tones are audible simultaneously but they can be distinguished). The phenomenal moment is divided into a center and its boundary areas. Heim’s example is inadequate, because tone-space (Ton-Raum) is four- or eight-dimensional, in which time is only a dimension. See Kai von Fieandt, Havaitsemisen maailma (Porvoo, 1962), pp. 244-261.

\textsuperscript{42} Ibid., p. 242
C. The Boundary of Dimension

According to Heim’s definition of the boundary of dimension, between the two (or more) limitless and infinite space-continuums there is a paradoxal dimensional boundary. If two limitless and infinite mathematical planes cut each other, the line between them does not divide these limitless planar spaces into four limited planes. If this were possible, the line would be the boundary of content. Instead, both planes conserve their limitlessness, but also dimensionally limit each other. It is impossible to describe graphically the boundary of dimension, but it is possible to imagine “paradoxically.” Heim uses the example of the flatlander from Edwin A. Abbot’s book, mentioned earlier, that the world or space of the flatlander is two-dimensional. The third dimension is a logical impossibility to the flatlander. If the third dimension, which is perpendicular to the two-dimensional flatland, suddenly opens up to the flatlander, he must realize that there are not two infinities, but three. According to Heim, this “paradox” disproves the logical law of bivalency. 43

The experience of the flatlander is the same as the next situation in our three-dimensional space (Figure 1):

![Diagram of a 3D shape with vertices A, B, C, D, E, F, G]

The shape could be seen as a two-dimensional plane, there are three squares ABCD, ADEF, and CDFG. It is also possible to see it as a three-dimensional quadrangular from above. Heim notes only these two possibilities,

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43 Heim’s “paradoxes” are perceptional, and differ from the ordinary paradoxes or antinomies, which in the history of formal logic are classified the following: (1) semantical antinomies (liar-, Grelling-, and Richard-paradox), (2) logical antinomies (Russell- and Burali-Fort-paradox), and (3) epistemological antinomies. See I.M. Bohenski, *Formale Logik.* (Freiburg: Orbis Academicus: Band III, 1956), p. 620. There are also Kant’s paralogisms and cosmological antinomies, which are, however, invalid, even in Kant’s own epistemology. See Jaki, *God and Cosmologists*, p. 11.
but there are also other possibilities. The shape could be seen as a three-dimensional box without its three walls, from above, and from the under side.\textsuperscript{44}

According to Heim, the dimensional boundary can be discovered in the following cases: between one-dimensional time-space (within physical time), and the two-dimensional plane-space, between two two-dimensional plane-spaces, between the worlds of “I” and “Thou,” between “I”-space and “It”-space, and finally, between “I”-space and “Thou”-space. One must note that Heim’s cases belong only to types (1) and (3) of the spaces, defined above. However, the definition of the dimensional boundary obviously implies that the boundary of dimension is between any two infinite spaces in spite of the number of dimensions or the type of space. For example, between n-dimensional type of space (2) and the “I” space (3) might be a dimensional boundary. No one may have any kind of experience about it, but we can intuitively imagine its existence.

It is important to notice that Heim used the concept of boundary also in a third meaning. Boundary is not only between contents and between dimensions of intramundane reality but also between supramundane and intramundane reality, that is between God and the world. What kind of boundary exists between transcendence and immanence? The answering to this question was the most important task of Heim’s whole life work, as we shall see in the next chapter, II.3.\textsuperscript{45}

\textit{D. Distinctions caused by the Double-Meaning of Boundary}

According to Heim, usually the words “boundary,” “opposite,” “other kind,” “beyond,” “outside,” and so on, are used in an “objectifiable” (\textit{gegenständlich}) sense (\textit{Sinn}). If these kind words are used in this naïve way, the consequences are conceptual contradictions and confusions, which are common even in scientific thinking. If these

\textsuperscript{44} About the perception of the visual depth-dimension, see Fieandt, \textit{Havaitsemisen maailma}, pp. 217-219.

\textsuperscript{45} \textit{GD}, pp. 53-61.
words are used correctly, in the senses of both content and dimension, the contradictions and confusions could be avoided.46

Heim argued that the double meaning of concept of the boundary cause five distinctions: contents and spaces, unity and difference of contents and dimensions, part-relation of contents and dimensions, contact between contents and confrontation or meeting between spaces, and knowing ways of contents and dimensions.

The distinction between contents and spaces could be seen in Heim’s definition of concept of space. Each, in itself a limitless and an infinite continuum is a space in which the contents are ordered according to a certain principle of structure. In every space there are contents, between which is the boundary of content. Between spaces, there is the boundary of dimension.47

The unity and the difference of contents can be immediately noticed in the following case. In the three-dimensional physical space between two rooms, there is the wall or the boundary of content. The rooms are different rooms, but the wall between them is the same for both. However, the dimensional unity and difference cannot be immediately noticed. We can explain it only paradoxically. The two limitless and infinite space-continuums are in a relation of either-or, but both spaces describe the same reality, because they are infinite. Heim illustrated this proposition pictorially. If we look at two pictures taken at different times of the same object, we can immediately notice that they are different pictures. They are taken from two different aspects. However, we cannot immediately notice that they represent the same object. The pictures are the disappearing small parts of the two infinite plane-spaces, which are cutting each other. Between these spaces, there is the boundary of dimension. Actually, we only believe that the pictures present the same object.48

46 Heim did not exactly distinguish the sense of word (Sinn) and meaning or reference or significance (Bedeutung), but uses both mixed. According to Gottlob Frege, the correct relation of sense and meaning is: “word → sense → meaning.” About Frege, see G.H. von Wright, Logikka, filosofia ja kieli. Ajattelijoita ja ajatussuuntaa nykyaikan filosofiassa, trans. J. Hintikka ja T. Nyberg (Helsinki, 1968), pp. 192-195, and Coffa, Semantic Tradition from Kant to Carnap, pp. 62-82. Husserl, on the other hand, argued “sense” equals “meaning” (Sinn=Bedeutung). Heim followed Husserl’s thinking. Husserl’s scheme of was: “I (Ich) → noema → object,” and the whole process is an act. See W. Stegmüller, Hauptströmungen der Gegenwartisphilosophie (Stuttgart: Kröner, 1965), p. 62.
47 GD, pp. 60-61.
48 GD, pp. 61-66.
The part-relation of contents is the relation between the wholeness and its parts in one and same space-continuum. It is some kind of quantitative relation. For example, in three-dimensional physical space, the hand is a part of the human body, and in two-dimensional physical space, the area of Tübingen is a part of Germany. On the other hand, the part-relation of dimensions is qualitative, and there are two possible relations: the dimensional coordination and subordination. The former prevails between spaces that have the same number of dimensions. The latter prevails between spaces that have a different number of dimensions. The dimensional part-relation prevails between two space-continuums that are in a relationship of the dimensional subordination to each other. According to Heim, it is paradoxical, because, for example, the infinite one-dimensional mathematical line is a part of the two-dimensional mathematical plane-space, and it is a part of the three-dimensional space, and so on infinitely. 49

Two contents of the same continuum of space are either separated or in contact with each other. The distance between them can be from zero to infinity. In the one-dimensional space of sound between two sounds can be a pause, or these two sounds overlap. Between two space-continuums, which are in a relation of coordination, is no distance that could vary, because the paradoxical confrontation or meeting prevails between them. The two infinite space-continuums cut each other without losing their own infinity. For example, two one-dimensional lines within a two-dimensional plane-space can cut each other at a point P, which does not divide these spaces to the four finite parts but belongs to the two infinite spaces created by the lines. Heim argued that in mathematical topology, it is not common to speak of two infinities, but only one infinity of the same dimension. 50

The act of knowing creates a phenomenological wholeness whose poles are the conscious subject and the perceived object. According to Heim, it is impossible to definite the concept of “knowing,” because it is inseparable from the “act” of knowing. Knowing is thus an indefinite and ultimate “word” or “function” (Urwort or Urfunktion), as are both the terms “reality” and “existence.” Knowledge and knowing have different meanings. All scientific methods (descriptive-inductive, intuitive-phenomenological,

49 GD, pp. 66-69.
50 GD, pp. 69-71, note 1, p. 70.
transcendental-logical, analytical, and so on) suppose what knowledge is. It is mistake to define what knowledge is with these methods, because of *petitio principii*, or we get into spin: *regressus ad infinitum* (object→ language→ meta-language→ meta-meta-language and so on infinitely). We can avoid these errors if we agree beforehand what knowledge is. Therefore, like Husserl, Heim made a phenomenological convention, which is important for understanding his dimensional thinking.\(^{51}\)

The scheme of the act of knowing in Husserl’s phenomenology was: intentional act \(A = (\text{transcendental act of transcendental subject } S \leftrightarrow \text{noema(s) } N) \rightarrow (\text{transcendent object } O)\). So: \(A = (S \leftrightarrow N) \rightarrow (O)\), in which \(O\) is inside phenomenological parentheses. In the intentional act the transcendental subject, which is constituted by acts, is the pure consciousness. The noemas are either a part of the class of objects or senses of perceptions. The objects are the transcendent entities that are put in parentheses in the phenomenological reduction. Phenomenology is the science of noemas. According to W.V. Quine, the intentional rhetoric must be send back to the stimulus-response-scheme: \(S \rightarrow R\). Because Heim was influenced by Husserl’s phenomenology, as we have argued above, the criticism of phenomenology concerns also Heim’s work. However, if Quine’s argument is right, also the analytical philosophy itself is wrong.\(^{52}\)

According to Heim, the knowledge way of contents means that we characteristically know about contents of a space-continuum making perceptions and inductive conclusions by *a posteriori*. For example, the discovery of a new star or galaxy is to know it by way of “content.” Instead, the discovery of a new space or dimension is to know it by way of “dimension,” which means, by way of a synthetic *a priori* argument. Discovering new spaces does not happen by making observations and inductive conclusions, but the discovery takes place, when the space opens to us immediately and perfectly. We do not only know that it exists but immediately also its structure and principle of order, according to which its contents are organized. Because the dimensional way of knowing is immediate and intuitive, it is more fundamental than the knowing way of content.\(^{53}\)


\(^{53}\) *GD*, pp. 71-75.
According to logical empirism, however, there are no synthetic judgments *a priori*, as Immanuel Kant had believed. Only analytical sentences can be *a priori*, and only synthetic sentences can be *a posteriori*. Analytical sentences do not apply to reality. They are formally true in spite of experience, and from them nothing follows for experience, because the analytical sentences have no actual content. Synthetic sentences, on the other hand, have a certain actual content, because they describe reality. Heim accepted Kant’s doctrine of “synthetic judgments *a priori*,” but he did not argue in favor of “judgments” but paradoxical “events” of the dimensional knowing way. 54

3. Polarity

Heim’s concept of space argues that reality is constructed of limitless and infinite continuums that are n-dimensional, and that could be seen or unseen, experienced or inexperienced, objectifiable or non-objectifiable. His concept of boundary explains how infinite spaces border each other, and how their contents are separated from each other. These two concepts could be sufficient as a basis for dimensional thinking, because their fundamental quality is “dimensional” or “dimension.” Against “Occam’s razor,” however, Heim needed a new concept for his dimensional doctrine. The concept of “polarity” was necessary because the concept of boundary explained only the relations in intra-mundane spaces. The ultimate questions of Heim’s thinking were, what kind is the boundary between immanence and transcendence, what kind of relation is between them,

54 According to A.J. Ayer, *Language, Truth and Logic* (London: Victor Gollancz, 1964), pp. 77-80, analytical propositions are tautologies, but they increase knowledge, because they explain how certain symbols can be used. There are synthetical and analytical sentences. Both increase knowledge, but the synthetical sentences are more important than the analytical sentences. According to Heim, there are synthetical and synthetic-analytical sentences. Both increase knowledge, but the latter are more important than the former. According to Quine, *From a Logical Point of View* (Cambridge: Cambridge University Press, 1961), pp. 20-24, the dichotomy “analytical-synthetical” is one of the metaphysical dogmas of empirism. Only logical truth is clear. Analytical truth is unclear. However, according to Popper, “there are, no doubt, synthetic *a priori* judgments, but they are often *a posteriori* false.” Hence, they can sometimes be true *a posteriori*. See Coffa, *Semantic Tradition from Kant to Carnap*, p. 332.
and how it is possible to know something about God or is it impossible to know any thing about God?

Heim did not use the concept of polarity in his early work. However, the “polarity” as such was very important in Heim’s world-view. The other concepts had taken its place, like “relation,” “alternative,” “exchange,” “either-or,” “antinomy,” and “compensation-phenomenon.” Heim often used these terms to justify his “polar” thinking. In fact, it was similar to the method of idealism (thesis → antithesis → synthesis), or to the scholastic method (sic et non). The first time the concept of polarity appears in Heim’s texts in the essay “Der gegenwärtige Stand der Debatte zwischen Theologie und Naturwissenschaft” (1908). Heim borrowed this concept from Schelling’s speculative system of “ideal-realism.” The concept of polarity was for Heim “a form of the world” (Weltsformel) or “a law of the world (Weltgesetz).”

Polar relation is, for example, between two complementary colors. According to Heim, there are no colors without this polar relation, because one color is no color, and a single dimension is no dimension. Therefore, between infinite spaces, there is not only the dimensional boundary but also the polar relation. The spaces constitute each other. There is no past without presence, no “I” without “Thou,” and no objectifiable without non-objectifiable. There must be the last “dimension of dimensions,” which is also in a polar relation with all intramundane reality. Thus, it is impossible that reality exists without God and God without reality. They both necessarily presuppose each other. In other words, Heim argued that both God and the world are necessary. Later, Heim’s concept of “supra-polarity” presupposed that only God is necessary but the world is contingent, as we will see in the next chapter.

\[55 \text{GL, pp. 39-68, and GN, pp. 146-154. See also Timm, Glaube und Naturwissenschaft, pp. 29,82, and Chapter I.2.}\]

\[56 \text{“Dimensionen sind immer nur im Verhältnis zueinander da. Sie bedingen sich gegenseitig. Wir nennen dieses Verhältnis ein polares Verhältnis, d.h. eine Unterscheidung, bei der die beiden unterschiedenen Elemente einander gegenseitig konstituieren.” GD (1931), p. 70.}\]

\[57 \text{GD (1931), pp. 166, 224, 320-321, 351.}\]
A.  *Intra-mundane polarity*

Heim defined the concept of polarity in the following way: the polarity is the distinctive double relation between two infinite and limitless spaces or two contents of an infinite and limitless space. For example, in three-dimensional physical space motion and rest constitute each other, that is, a condition of motion exists only if a condition of rest exists, and vice versa. Moreover, the polar relation of motion and rest is in a similar relationship to the original condition of “indifference,” which is either real or imagined. The relation between motion and rest is polar, because it can be understood as the differentiation of an original unity (*Ureinheit*). However, polarity is neither the relation of cause and effect nor the relation of argument and consequence. It is the given original relation (*Urverhältnis*). We could illustrate the law of the double polarity in the following way (Figure 2):

![Diagram](attachment:diagram.png)

where P means “pole,” Po “the opposite pole”, and Pi “indifference pole.”

According to Heim, the law of double polarity rules all relations of contents and dimensions. All opposites are variations of the same theme of the “cosmic symphony.” For example, the following relations of energy are polar: motion↔rest↔original balance, color↔countercolor↔light, light↔shadow↔original light or night, sound↔other sound↔original sound or silence. The law of double polarity holds true in every field of energy: there is no power without the opposite power, and every tension is the


59 See W. Heisenberg, *Philosophical Problems of Quantum Physics*, pp. 60-76. Heisenberg compared the teaching on colors of Goethe and Newton. For Goethe, colors were created by polar combinations of dark and light, for Newton, by light alone. Newton’s theory was scientific, and Goethe’s theory artistic. For Heim, polarity was a dynamical and absolute simultaneity.
differentiation of the energetic condition of indifference. This condition of indifference is both the first and the last condition of the universe: infinite energy or non-energy, infinite heat or coldness, life or death. All energetic events or causal relations can be understood as a differentiation of the original condition and as a transition back to the “lost paradise.”

Polarity also rules human lives. Existence is the continuous undulation between joy and suffering, action and passion. The effort toward a goal is suffering, and the achieving it is joy. When the purpose is achieved, it becomes a new starting point, and so on infinitely. Polarity also rules the fundamental categories of time, space, and the dimensional relations between spaces. In time-space, in which the principle of the order of contents is successional, the elements of the limitless and infinite time-continuum: past, present, and future, depend on each other. Time has neither a beginning nor an end, because every start-point is the end-point of the time-period before it, and every end-point is the start-point of a period after it. Time and all events of the universe have neither causal reason nor any ultimate purpose. However, it is possible to think that the time-continuum is the effect of a “Big Bang” in the condition of indifference. The mystics named this condition nunc aeternum.60

In three-dimensional physical space, it is possible to say “here,” if there is something “there.” Not every point in the universe in itself can be anywhere, because as such it could be everywhere and nowhere. The place of any point in the universe is determined by the polar relation to some other point or points. Behind this polar relation, there is a possible condition of indifference in which there are no “here-there” relations.

Polarity also belongs to the non-objectifiable dimensional relations of spaces. For example, “I” am through “Thou,” and vice versa. In the same way, “I” am through “it,” and vice versa. These polar relations are neither causal nor logical. Behind them, there is a possible condition of indifference: an original unity, like that which occurs in teaching of eastern mysticism.61

Reality and consciousness are not contents of anything that could exist in itself, but all objectifiable and non-objectifiable entities are both quantitatively (Dasein) and

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60 GD, pp. 153-155, 179-184, and GN, pp. 52-58.
61 GN, pp. 147-150.
qualitatively (Sosein) dependent on the existence of an opposite pole. It is not possible to perceive or to imagine any content or space without some relation. The continuum of relation goes on limitlessly. However, Heim did not say, if it is infinite or not. He thus avoided Kant’s antinomy of “finite and infinite.”

In fact, polarity and the dimensionality are analogous with the concept of the “field” in physics and of “complementarity” in particle physics or in the other words, the absolute simultaneity between spaces. The conflict between GR and QM could be understood as a dimensional and polar function of time.

B. Supra-Polarity

According to Heim, polarity is a “world-formula” (Weltformel). It rules in all four types of intra-mundane spaces and between them. However, one must ask, “Is polar reality the only form of existence?” If polar reality is the only one, it is possible to think in two ways, either positively or negatively. Chinese Taoism and the nihilism of Nietzsche take a positive stance. Philosophy of the Vedanta and Buddhism take a negative stance. If polar reality is not the only one, another reality or form of existence is not impossible, unless the polarity in it is “abolished” positively.

According to Heim, “supra-polarity” is abolished polarity positively, because both are spaces. On the other hand, he also argued that supra-polar space is “non-polar” and “non-spatial.” He thus jumps to supra-polarity by way of a negation. However, according to logical empirism, logical negation does not imply existence, which means, it is impossible to say anything about existence of the supra-polar space. According to logical empirism, it is therefore impossible that the supra-polar space exists. Heim can only postulate it. Yet, according to principle of ontological tolerance, Putnam’s practical

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62 From the viewpoint of contemporary science, Kant’s first antinomy of “infinite and finite” has lost its physical meaning, because the universe is not infinite, but finite and limitless. There could be no first antinomy even based on premises of his epistemology. In arguing the first and second antinomies, Kant shifted from empiricist to idealist grounds and back. See Jaki, God and Cosmologists, p. 11. See also W.H. Newton-Smith, “The Beginning of Time,” in The Philosophy of Time, ed. Robin Le Poidevin and Murray MacBeath (Oxford: Oxford University Press, 1993), pp. 172-176. In both cases Kant’s arguments take place under the assumption that time had no beginning.

63 Timm, Glaube und Naturwissenschaft, pp. 82-83, and Chapter IV.3.
realism, and Popper’s three-world ontology, “supra-polarity” can exist as a practical and theoretically essential postulate, because it is a necessary concept in Heim’s dimensional thinking.64

Supra-polar reality is space in the same sense as polar reality and its spaces. Supra-polar space is transcendent, but not in the usual meaning, because between it and polar reality are neither the boundary of content nor the boundary of dimension. The supra-polar space exists neither “in transcendence” nor “in immanence.” It is not “above,” “under,” “beyond,” “supernatural,” and so on, in the usual meaning of these words. Those terms do not lead from a polar form of existence. If supra-polar space is not polar, the polar spaces cannot be either beside it or outside of it, because then the double law of polarity rules between them. Therefore, there is only one possibility left that the supra-polar space is in a non-spatial (nicht räumlich) or non-dimensional way present in every moment everywhere in all polar spaces and it includes the whole reality. Thus, supra-polarity, as genuine transcendence, is, at the same time, temporally transcendent and immanent, because its dimension of time is not physical but only eternal. 65

Heim argued that the discovery of supra-polar space is “the second Copernican revolution” in human history. The first one was the discovery of a non-objectifiable reality by Fichte and Rickert, where “I” and “Thou” meet each other. The second one is more important, because with supra-polarity it is possible to fulfill the idea of quantum physicist Pascual Jordan: the translation of content of the faith into the language of modern science.66

Chapter III

THE INTENSION OF HEIM’S DIMENSIONAL THINKING

We have analyzed the three basic concepts of Heim’s dimensional thinking: space, boundary, and polarity. The concept of space says that reality is constructed by limitless and infinite spaces, whose dimensions are \( n \). There are: physical, mathematical, psychic or conscious, and panpsychic spaces. The opening of a new space is always a paradox, and it happens passively as a gift, that is, as a synthetic event \textit{a priori}.

The concept of boundary says that there is a dimensional boundary between limitless and infinite continuums of space, and a boundary of content between contents of a given space. The dimensional boundary is the velocity of light. From these meanings follow certain distinctions: that of content and space, of unity and difference of content and dimension, of the relation of parts of content and dimension, of contact of contents and confrontation or meeting of dimensions, and finally of knowing way of content and dimension.

The concept of polarity says that between spaces, and between contents within a space, is a double polarity that is neither causal nor logical: \(((\text{pole} \leftrightarrow \text{opposite pole}) \leftrightarrow \text{indifference condition}))\). In fact, polarity is the absolute simultaneity between spaces. In addition, there is also another form of reality, in which polarity is abolished positively, namely, supra-polarity. Supra-polarity is genuinely transcendent space, which non-spatially is present in every polar space, and which appears only passively as a gift, that is, as a synthetic event \textit{a priori}.

According to the basic concepts of Heim’s dimensional thinking, reality has two realms or forms: polar and supra-polar. Polar spaces are intra-mundane (\textit{innerweltliche}) reality, in which as an effect of double meaning of the concept of boundary could be distinguished dimensional relations. Supra-polar space is genuinely transcendent reality that differs from intra-mundane relations of transcendence, because it is not spatially transcendent but only temporally transcendent. The temporal transcendence means that
the dimension of time in supra-polar space is not physical but only eternal. However, reality is the relational unity between the two realms, not any two-story house.\footnote{Some scholars have argued that Heim’s world-view is dualistic. See, for example, Holmstrand, \textit{Karl Heim on Philosophy, Science and the Transcendence of God}, pp. 117-140, and Hille, \textit{Das Ringen}, pp. 428-430. However, Heim’s critics have not understood that transcendence is not spatial but temporal. See also Timm, \textit{Glaube und Naturwissenschaft}, pp. 100, 107.}

It is logical to divide the analysis of intension in Heim’s dimensional thinking into two parts: that concerning polar spaces and that of supra-polar space. Then I will formalize his dimensional thinking.

1. Polar spaces

Heim argued that the world of “I-Thou-it” is an undivided unity. However, there are some important dimensional and polar relations in this reality. It must draw at least two dimensional boundaries, namely, the boundary between “I” and “Thou,” and the boundary between “I” and “it.” There are four relations in intra-mundane reality. First, there is the dimensional relation between “I” and “my it” (I / i). Next, there is the dimensional relation between “Thou“ and “your it” (T / t). Then, there is the dimensional relation between “I” and “Thou” (I / T), and finally, the dimensional relation between “my it” and “your it” (i / t).\footnote{According to Heim, the parts of “I-Thou-it”-world are: I, T, i, and t. It is logically possible that between these parts, there are nine relations, from which Heim mentioned only four. See GD, p. 79. The other relations are: I/t, T/I, i/I, t/T, t/i.} There are intra- and inter-individual differences between these dimensional relations. These variations arise as a function of time, and all four relations always prevail at the same time. Qualitatively, these four relations could be reduced to three. Heim presupposed that I / i $\equiv$ T / t. If the former part of this equation, I/i, were the only certainty, it follows that knowledge and experience can be only phenomenal and subjective, thus solipsistic. If Heim’s equation is true, as it possibly is, it follows that knowledge and experience are realistic and intersubjective.\footnote{GD, pp. 80-81. The identity I/i $=$ T/t is possibly true in space-type (3), but whether it is true in space-type (4), is controversial. Heim ignored this problem.} Heim’s presupposition

\textit{\footnote{1} Some scholars have argued that Heim’s world-view is dualistic. See, for example, Holmstrand, \textit{Karl Heim on Philosophy, Science and the Transcendence of God}, pp. 117-140, and Hille, \textit{Das Ringen}, pp. 428-430. However, Heim’s critics have not understood that transcendence is not spatial but temporal. See also Timm, \textit{Glaube und Naturwissenschaft}, pp. 100, 107.\footnote{According to Heim, the parts of “I-Thou-it”-world are: I, T, i, and t. It is logically possible that between these parts, there are nine relations, from which Heim mentioned only four. See GD, p. 79. The other relations are: I/t, T/I, i/I, t/T, t/i.\footnote{GD, pp. 80-81. The identity I/i $=$ T/t is possibly true in space-type (3), but whether it is true in space-type (4), is controversial. Heim ignored this problem.}}}
makes room for his hidden purpose to unify idealism (phenomenalism) and realism (physicalism). 4

The three phenomenal and physical dimensional relations of reality are: i / t, I / i, and I / T. These construct an inseparable unity of reality. It is possible to analyze them separately because their structural laws and principles of order are different. According to Heim, structural law rules the quality of a space and its contents. Thus, a structural law can be either dimensional or contential. The principle of order provides the means, by which the contents of a space are organized. 5 In this dissertation, however, I will analyze those three relations together, because it is more systematic than if I were to follow Heim’s thinking word for word. My analysis focuses on spaces, dimensional boundaries, dimensional unity and difference, dimensional relations of parts, dimensional confrontation or meeting, and finally, dimensional way of knowing.

I should add two remarks of this analysis. First, it is not necessary also to analyze the contents of spaces and boundaries of contents, because this dissertation covers only Heim’s dimensional thinking. Second, the spaces are analyzed before the dimensional boundaries. My analysis differs radically when compared with Heim’s work, because I argue that the double meaning of the concept of boundary is a consequence from Heim’s definition of the concept of space. In fact, it would be meaningless to speak at first about boundaries between spaces, and then spaces themselves, as Heim did.

A. Spaces

In the intra-mundane reality of “I-Thou-it” are the dimensional relations of “i/t,” “I/i,” and “I/T.” The embryos of these relations, “i,” “t,” “I,” and “T,” are limitless and infinite spaces. In addition, there are also two other spaces: “w”-space or “world-space”

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5 GD, pp. 77-78.
(Welt Raum), whose parts are “i” and “t,” and “W”-space or “we-space” (Wir-Raum),
whose parts are “I” and “T.” Thus, the polar reality of “I-Thou-it” is constructed from
two types of spaces: physical and conscious.

Heim started his space-philosophy with a short historical survey of western
metaphysics of “I” (Ich). According to Heim, the most remarkable philosophical ideas
about “I” or “self” have been in the metaphysics of Plato, in Kant’s transcendentalism, in
the German absolute idealism of Fichte, in the Neo-Kantianism of Rickert, and in the
existentialism of Heidegger. 6

According to Heim, Plato was the discoverer of “self” or “soul.” According to
Plato, there are two worlds: the visible and variable world of the senses, and the invisible
and invariable world of ideas. “Soul,” which is an indivisible substance, belongs to the
invisible and invariable world. Kant adopted these notions from Plato. “I” or “self-
consciousness” is “consciousness in general” (das Bewusstsein überhaupt), in which
every individual substance participates. Therefore, “I” is not an individual substance
beside other similar entities, like things, that can be itemized. Fichte transformed Kant’s
thoughts by arguing that there are two different kinds of “I”: the absolute and the relative.
The “absolute I” is an invariable and eternal, thinking and willing, and non-objectifiable
“subject.” It is not substance. The object or correlate of the “absolute I” is the individual
and psychological “relative I,” which is variable and transient. 7 Rickert formulated the
basic ideas of “I” in a more radical way than Kant and Fichte did. “I” is the non-
objectifiable “epistemological subject” in which every empirical (physical,
psychophysical, and psychic) subject participates. According to the existential
phenomenology of Heidegger, the existence of “I” (Dasein) is characteristically
existential which means, it is “to be” in three basic relations: “to be in the world” (in-der-
Welt-Sein), “to be toward death” (Sein zum Tode), and “to be together” (Mitsein).
Existence is the primary intentional relation of “I” and “Thou,” in which “I” exists only
as constituted by “Thou.” The Cartesian idea that “Cogito, ergo sum,” is the most fatal

6 GD, pp. 82-161, and GN, pp. 30-43, 103-110.
7 See Chapter I.2.B. Compare also Schelling’s concept of self. According to M. Vater, “Odyssey of
Consciousness,” in Schelling, System, pp. xii-xiii, Schelling’s “self” or “I” is the unitive consciousness.
The self is primordially both activity and limitation. Inside the process, it consciously makes itself to be
both subject and object, finite and infinite. The self is doubled in that it appears to itself. It loses the
abstract simplicity of Fichte’s self-positing (I=I). It ceases to be in-itself and becomes for-itself.

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flaw (*proton pseudos*), because the absolute and solipsistic ego cannot exist. According to Heim, the correct sentence must be “Sum, ergo cogito.”

In the opinion of Heim, since Heidegger, it has been impossible to use the concept of “existence” naïvely or unambiguously. It is impossible that existence (and knowledge about existence) is only ontic. It must also be ontological. This means that the existence of “I” (*Dasein*) is wholly different from the existence of an “it” world (*Vorhandensein*). The physical or ontic form of existence and the ontological form of existence must be separated. However, in the opinion of Heim, Heidegger used language unsatisfactorily, because for Heidegger both concepts, “physical” and “existential,” concern contents. Heim argued instead that the languages of contents and dimensions must be separated. Thus, the concept of the “physical” or “ontic” is applicable only to contents, and the concept of the “existential” or “ontological” is applicable only to dimensions.

According to Heim, “I” is the energetic, volitional, non-objectifiable, and present reality, and as such, it has neither content nor “gestalt.” I speak about “I” in the first person, but it is not my physical body, because my body is an object of my act of knowing, and the tool of my will. “I” has no psychic content, like self-consciousness, self-awareness, feelings, imaginations, thoughts, and so on, because it is the seer, and it experiences. Heim’s proposition could be illustrated by this simple optical fact: the seeing point itself is invisible. As soon as it becomes visible, it is no longer the seeing point. I cannot make myself into my own object or walk over my own shadow, as, for example, Fichte thought. Introspection leads to *regressus ad infinitum*. The “invisible” and “non-objectifiable” qualities of the “I” are, however, different with the invisibility of the electrons and other sub-atomic particles or my brain, whose existence is evident.

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8 About “Cogito, ergo sum” of Descartes, see Jaakko Hintikka, “Cogito, ergo sum: Inference or Performance?” *Philosophical Review* 71 (1962), pp. 3-32. According to Hintikka, the implication of statement “Cogito, ergo sum” is (1): $A(b) \rightarrow (\exists x)(x = b \& A(x))$. Descartes notes that he thinks: $A(b)$, and concludes that he exists: $(\exists x)(x = b)$. Conclusion is logically true, if (1) is true. In fact, he realized that the sentence “I am not” is a contradiction, and the sentence “I am” proves itself existentially. Hence, Descartes must presuppose what he wanted to prove.

9 Heim agreed with Heidegger’s ontology in his essay, “Ontologie und Theologie.” in *Zeitschrift für Theologie und Kirche* 11 (1930), pp. 325-338. According to Morrison, *Einstein, Kant and Tillich*, pp. 378-380, in ontic reality of Kant and Einstein, personhood is the center of consciousness, perception is discrete, and between subject and object prevails distinction, whereas in ontological reality of Heidegger, Tillich, Bohr, Heisenberg, there is no personhood, the category of center is removed, and the split is before subject-object. Heim’s concept of dimensionality means that a relation prevails between ontic and ontological realities, that subject and object imply each other. Thus, he could unify Kant’s and Heidegger’s thinking.
indirectly. In the same way that we can examine only the effects of energy, we cannot objectify “I” but only its effects, that is, after its volitional decisions.

It seems that it is possible to speak about “I” only “nonically,” in other words, by denying all relations. Heim argued, against Fritz Künkel, that it is possible to talk exactly about “I” only by using existential propositions. These propositions are judgments whose origin is immediately within me. Based on Heidegger’s existentialism, Heim concluded that “I” is primary reality, in which there are two factors: constant and variable. The constant factor is “I myself,” ens realissimum, which is “given,” “non-objectifiable,” and the perspectival center of the world. However, it does not exist in four-dimensional space but beyond it, that is, in the second, eternal, dimension of time. The variable factor has a certain place in the four-dimensional continuum of space-time, which I call my body. Both are passively received or “given,” and as such, are my destiny. Heim argued that the separation of the constant and variable factor of “I” is necessary, because the “transmigration of souls” could be imagined.

The immaterial and non-objectifiable quality of “I” has been the subject of heavy criticism, especially, from the point of view of materialistic monism. Friedrich Karl Schumann argued that the idealistic concept of “non-objectifiable” is something mystical. It is impossible to say anything at all about it, because it has no content. J. Rehmke argued, like Husserl, that it is senseless. “I” cannot be a non-objectifiable entity, because I can know something about myself. “I” is the object of knowledge. It is a certain type of thing that differs from other things because it is impossible to localize it. It is non-spatial being, analogous to the spatial thing. There is only material reality. According to Heim, it is impossible to verify or falsify the monistic and materialistic world-views of

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11 It is possible to imagine that one and same soul transmigrates to another body. In the same way, it is possible to imagine that “I” could change to another “I.” However, Heim rejected these ideas. He agreed with Plato who said that “soul” is invariable. However, for Heim “soul” is not any “substance” but only invariable “subject,” which is inseparable from its variable “object” or “body,” where it is “incarnated.” According to the Bible (1.Cor.15), in the resurrection, the soul and the body will be free from temporality and change to eternal entities. See GN, pp. 110-121. If time travel is possible, as Gödel and some others believed, transmigration could be possible as well. See Kaku, *Hyperspace*, pp. 232-251.

12 GD, pp. 117-120. See also Friedrich Karl Schumann, *Der Gottesgedanke und der Zerfall der Moderne* (Tübingen, 1929), pp. 200-220.
Schumann and Rehmke, because the origin of these world-views is not experience but prejudice. Heim’s argument must be proved. The Rehmke’s statement, “There is only the material reality,” is equivalent to the sentences, “There is no non-material reality” or “Every reality is material.” Thus, (~∃x)~Ax = (x) Ax. In Heim’s opinion, it is impossible to verify or falsify these statements. Nevertheless, his argument is too strict according to Popper’s principle of confirmation. According to Popper, it is possible to falsify (x)-sentences but not to verify them. Although, in every tested case it appears ‘A’, it is always possible that later some ‘~A’ appears. On the other hand, it is possible to verify (∃x)-sentences but not to falsify them. Heim’s argument could be true, if the form of sentence is (x)(∃y) Axy. Moreover, Heim justified his argument by arguing that the origin of Rehmke’s world-view is not based on statements of experience. However, Heim did not exactly define what kinds of statements he intended. Are these phenomenal φ-sentences or physical f-sentences? In each case, Heim’s statement is also impossible to prove because Eino Kaila, who was a member of Vienna Circle, has proved that it is not possible to verify or falsify either f-sentences or φ-sentences, but only to test them.13

Heim battled against all absolute world-views: materialism, realism, idealism, and dialectical theology. His own position was a relative or relational monism.14 When Rehmke, a prominent materialist in Heim’s lifetime, said that from the sentence “I know something about myself” follows necessarily the sentence “I am material.” Heim argued that it is not the whole truth. The sentence “I am non-material” is neither necessarily impossible nor contradicio adiecto. Rehmke’s sentence is: (x) (kx → y), and Heim’s sentence is (x) (kx → ~y), in which x = “I,” k = “I know,” and y = “I am material.” The implication is untrue only if the antecedent is true and the subsequent is untrue. Therefore, neither Rehmke nor Heim can conclude that in every case, “I am material” or “I am non-material” is the logical truth. Heim argued that inductive argumentation is inadequate because it is applicable only to contents. Heim’s argumentation is

14 GD, pp. 15-51.
dimensional. Heim argued that it is possible to know synthetically a priori that “I am non-material being.”\(^{15}\)

According to Heim’s conclusion, “I” is non-material and non-objectifiable. It is not only the epistemological subject but also the volitional subject. I am both a knowing and a willing person. “I” is the invisible agent. As an ontic being, “I” cannot be free, but as an ontological being “I” is free. “I” is a form of reality that cannot be analyzed introspectively, because it is impossible to know quantity of “I.” Although, it is impossible to measure the power of the will, we usually believe in it. We can only measure the effect from the motions of will. My actions are the visible effect of my will.\(^{16}\) It is necessary to think that the will is non-material and non-objectifiable. The conclusion of this proposition is that, in fact, the sentences “There is a non-material will within me” and “I is non-objectifiable” make the non-material subject into the material object of knowledge. Heim argued that, because our language is imperfect, we use it improperly, but this does not mean that the language could factually objectify non-objectifiable reality. We know immediately the existence of it, because we exist in it. When I use the word “I,” I do not talk about “I” but from “I.”\(^{17}\)

Heim’s conception of I-space could be presented in the following propositions:

“\(I\)” is immediately given, present, non-material, and non-objectifiable space. “\(I\)” is the perspectival center of reality. “\(I\)” is the epistemological and volitional subject. The existence of “\(I\)” is polar. “\(I\)” is identical with the constant factor of “\(I\).”

According to Heim, the problem of “I” or “self” has been discussed in western philosophy since Plato, whereas the problem of “Thou” or the “other consciousness” has been the subject of analysis only since Heidegger.\(^{18}\) According to a Neo-Kantian idealist Rickert, “I” must consider itself as the perspectival center of reality because there is only

\(^{15}\) One should notice that the sentences of Rehmke and Heim together are \((x) \,(kx \rightarrow y \vee \neg y)\), which is identically true, but factually not necessary.

\(^{16}\) GN, pp. 52-66. Modern experimental psychology does not anymore use the term “will” as agent of action but “motivation” that is analyzed as a function: \(S \rightarrow O \rightarrow R\). However, motives are unknown. It is possible to define them only operationally. See Anitra Karsten, Motivation und affektives Geschehen (Bern, 1968), pp. 281-284.

\(^{17}\) According to Heim, we must use the one and same language in two different meaning: of content and of dimension. Kant had separated theoretical and practical languages from each other. We know theoretically and think practically.

\(^{18}\) GD, pp. 79,140-151, and GN, pp. 43-52.
one non-objectifiable and invisible epistemological subject. Real individual subjects, in turn, belong to the objectifiable reality of experience. When I say “Thou,” I objectify you. However, this conception is a fatal mistake for idealism. It talks about the non-objectifiable “I” but denies the existence of the non-objectifiable “Thou.” If there is a non-objectifiable “I,” it is necessary to be able to imagine that there are other subjects that belong to same non-objectifiable reality. In the opinion of Heim, the ideas of Heidegger and Martin Buber are ontologically consistent and true. According to existentialism, if we say “Thou,” it means that something dark and strange enters into the quiet and well-organized world of “I” and shakes its grounds. It is necessary to think that there is reality that is not only “to be in the world” (in-der-Welt-Sein) or “to be toward death” (Sein zum Tode) but also “to be together” (Mitsein). Heim used Heidegger’s ontological terminology and Buber’s dialogical terminology, but with a different meaning. For Heim, reality of the people is “Mitwelt,” their existence is “Mitsein,” to be in the sight of other people is “Mitdasein,” and the existence of “I” is “Dasein.” However, the “I” of Heidegger’s reality is finite because we are mortal, whereas Heim’s “I” is infinite because it is space. Buber’s relation of “I-Thou” or dialogue is direct, whereas Heim’s “I-Thou” relation is dimensional and indirect.

According to Heim, shocking fact is that there are two perspectival centers in reality, two constants, which are bound to their own variables. The seeing and knowing point is in two places, and both of them demand that only “I” am the perspectival center of reality. However, the two “I’s” (Ichhe) is, even linguistically, an inadequate expression, because one must use the word “I” in German (and in English) only in its singular form. If a plural form were possible, then “I” loses its quality to be non-objectifiable and changes to one itemized object among others. However, even against the linguistic rules, it must use the word “I” in plural. Like Fichte, Heim argued that “Thou” is “Non-I,” which is “T” (Ein Du ist ein Nicht-Ich, das ein Ich ist). Dietrich Bonhoeffer argued

19 Heim referred to Buber’s most widely known work, Ich und Du, (Berlin, 1922). Buber’s philosophy of dialogue, a religious existentialism, centered on the distinction between direct, mutual relations, “I-Thou”-relationship or dialogue, in which each person confirms the other as of unique value, and indirect, utilitarian relations, “I-It”-relationship or monologue, in which each person knows and uses others but does not really see or value them for themselves. In ontic reality, these conceptions are invalid. They can be thought as true only ontologically.

20 About Heidegger and Buber, Stegmüller, Hauptströmungen, pp. 184-185.
against Heim that this thought is inconsistent. If it is so that “T” equals “non-I” equals “I,” it is contradictory both in classical and in intuitionist logic. The sentence means that “I” am “Thou” and “I” am “Non-Thou” are simultaneously true. This sentence is consistent only in the logic of Hegel, Marx, Heidegger, Bohr, and Heisenberg. In their logic, the law of non-contradictory is not universal. Bonhoeffer was right in his criticism, but he did not understand Heim’s dimensional thinking. Heim meant that looking from I-space, “T” = “~I,” and that “~I” is also non-objectifiable. In other words, T ≠ I but both are non-objectifiable selves.

Heim’s picture of Thou-space could be presented with the following propositions: “Thou” is immediately given, present, non-material, and non-objectifiable space. “Thou” is a perspectival center of reality. “Thou” is the epistemological and volitional subject. The existence of “Thou” is polar. “Thou” is identical with the constant factor of “Thou.” “Thou” is the “eternally strange other.”

I- and T-spaces, which are, according to Heim’s definition of space, limitless and infinite continuums, have similar form, and they do not have any content. In addition, both spaces belong to reality, which was called by Heim “We-space,” and in this dissertation, for reasons of my formal presentation, “W-space.”

“Thou” is the seeing point that never can see itself. Mutatis mutandis, the same proposition holds for “Thou.” There is always a distance between seer and seen, by virtue of which scientific analysis is possible. This distance is a temporal time difference. Only “become” (gewordensein) can be the object of the scientific research, never anything present or “becoming” (werden). It is also physiologically obvious. We become conscious of phenomena only after they have happened. On this basis, Heim argued that the relation between “I” and “it” or “object” is identical with the relation

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22 von Wright, Logikka, filosofia ja kieli, pp. 90-100, 112. According to Morrison, Einstein, Kant and Tillich, pp. 378-380, Kant and Einstein obeyed the law of non-contradiction. It was an absolute logical law for them. Heidegger, Tillich, Bohr, and Heisenberg obeyed it in ontic reality, but rejected it in ontological reality, whereas Heim unified both contradictory realities, ontic and ontological, by thinking dimensionally. 23 GD, pp. 117-128, 140-151, GN, pp. 67-77, and WW, pp. 132-133, 187.
24 The terms “become” and “becoming” are too narrow for Heim’s dimensional thinking. Therefore, the terms “to be become” (gewordensein) and “to be becoming” (werden) were better, but because they are not grammatical forms in English, I cannot use them. In Finnish, it is possible to use “olla tullut” (to be become) and “olla tulemassa” (to be becoming), which makes those terms dimensional in Heim’s meaning.
between “become” and “becoming.” This means that “I” is identical with “becoming,” or at least that “I” belongs to the world of “becoming.” The formula of Heim’s argument is, thus, I: i ≡ W: w, in which “W” equals “becoming” and “w” equals “become.” The argument is inconsistent, because the identity I ≡ W and the inclusion I ⊂ W cannot be the same thing. 25

According to Heim, the propositions “become” and “becoming” and the concept of time, have two meanings that correspond to the objectifiable and non-objectifiable dimensions. The first meaning is secondary “become” or “process” (Vorgang) that includes the perceptual picture of a continuous sequence of the successive temporal moments: t₁, t₂, t₃, → tₙ in the physical continuum of time. The second meaning is primary “becoming” or “transition” (Übergang) that is the “place” or “situation” in which the secondary “become” appears into existence. In other words, the “not yet become” (ungeworden) reality becomes the “already become” (geworden) reality. Physical dimension of time and eternal dimension of time correspond to these forms of becoming. Physical time is the objectifiable, one-dimensional continuum that continues forward and backward infinitely and that can be measured by using physical measurements. Eternal time is the non-objectifiable continuum of I- or T-space, which is unchangeably bound with a certain place in the experienced world. In other words, a certain point among all other similar points within the continuum of physical time “suddenly” receives from non-objectifiable reality an accent that distinguishes it from others. It becomes present in a causally and logically inexplicable way. Therefore, the concepts of time found in Kant’s transcendental idealism and in German absolute idealism were false. According to Kant, time is only a form of intuition, and it is not temporal but outside physical time. According to German absolute idealism, “I” is a supra-temporal soul-monad that is looking outside of time how it is running. Heim argued that these ideas are the secondary or physical pictures of primary time. In fact, Heim’s concept of time is two-dimensional, that is, physical and ontological, or objectifiable and non-objectifiable, or temporal and eternal.

The eternal now-point, *nunc aeternum*, is a space. It includes in itself the factual past and potential future. The types of space (3) and (4), discussed in Chapter II, belong to it, that is, I-space, T-space, the will of both, and the consciousness of animals, plants, and other organic and inorganic spaces. These all determine *nunc aeternum*, which is the crossing point of destiny in our world. Heim argued that we must take seriously a positive attitude toward the animate and panpsychic nature of non-human reality. It is possible to conclude either inductively *ex analogia hominis*, or based on an ontological concept of time. We must think continuously, because nature does not make jumps (*natura non facit saltus*). On the other hand, we could also think complementarily, as in QM, that nature makes jumps (*natura facit saltus*). In every case, the principle of continuity is more probable than the principle of discontinuity.  

On one side of *nunc aeternum* (*Unvollendet*), there are limitlessly variable possibilities that are taking shape but have not taken it yet, and on the other side, there is eternally invariable reality (*Vollendet*), which has passed it. Therefore, there are two ways of being (*Seinsart*): “becoming” (*Werden*) and “become” (*Gewordensein*), which form synthesis. The past-presence and the future-presence are united in the present-presence.

Heim’s ontological concept of time differs from that of Heidegger. According to Heidegger, there are quantitative and infinite “objective” time, and qualitative and finite “subjective” or “existential” time. Subjective time is finite, because human beings are temporally finite, that is, mortal (*Sein zum Tode*). According to Heim, ontological time is not finite but infinite space, *nunc aeternum*.  

Heim’s picture of W-space could be presented in the following propositions: W-space is non-material and non-objectifiable time-space, our *nunc aeternum*. In W-space prevails inclusion (*I & T*) ⊂ W, in which “W” equals, not only We-space, but also “becoming” (*Werden*) or We-reality. The existence of W-space is also polar, because it is the condition of indifference of polar time-space.

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“I” and “Thou,” which belong to W-space are the two perspectival centers of W-reality (*Werden*). Heim argued that they are also the perspectival centers of w-reality (*Gewordensein*), as the scheme of the subject-object presupposes. It is impossible to analyze reality itself, as if it would have no perspectives. There is no reality in itself but only reality from an observer’s perspective. Kant had argued that the thing-in-itself and the universe as the whole are always unknown or noumenal entities, about which it is impossible to express positive or negative propositions. Heim thought that it was possible to imagine reality as itself. It is a space that is the sum of all experiences of every subject in every moment. However, such a space is abstract and inconceivable in our three- or four-dimensional view.\(^{28}\)

The perspectival center of i-space is “I.” “I” is the epistemological subject whose object is just “my space” (*meine Gegenstandswelt*). i-space is the complete four-dimensional continuum of space, which is closed. It includes the so-called outside world (*Aussenwelt*): my psychical world and physical body, your body and your psychical expressions, micro-cosmos and macro-cosmos. The concepts *Aussenwelt* and *Innenwelt*, Heim borrowed from Heinrich Rickert, and the corresponding concepts *Aussenbild* and *Innenbild* from Arthur Eddington.\(^{29}\) However, Heim did not realize that because the universe is limitless and finite, and because it includes complete three-dimensional space and physical time, it has only its inside, not any spatial or temporal outside, as Heim’s definition of the perspectival center also presupposed.\(^{30}\)

According to Heim, I can move in this space everywhere, but always I stay in my own world, that is, in the world as seen from my perspective, and that world has only one perspectival center. I can change my lookout spot at the speed of light or in my imagination. However, I can never have two aspects simultaneously only consecutively. In other words, there is a logically disjunctive relation of either-or. The center of my consciousness-space (*Bewusstseinsraum*) is either here or there, but not both here and

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\(^{29}\) *GN*, pp. 69, 78.

there simultaneously. However, because in Heim’s dimensional thinking time is two-dimensional, it means that time travel is a probable possibility.  

Heim’s picture of i-space could be presented in the following propositions:

i-space is objectifiable and phenomenal space of my consciousness (Bewusstseinsraum).

The perspectival center of i-space is I-space. The existence of i-space is polar.

A paradox of w-reality is that there are two perspectival centers simultaneously in one reality. Thus, about this same reality, there are at least two different world-views. In addition, both of them demand the center position, which only one of them could have. According to Heim, this proposition is a logical contradiction. Because i-space is a limitless and infinite continuum, another space cannot exist outside it. However, there is another space that Heim called “the space of the other consciousness” or “your space,” which is called, for reasons of my formal presentation in this dissertation, “t”-space. In fact, there is not necessarily any logical contradiction in the sentence: i = (~i = t).

Heim’s dimensional doctrine is quite similar to Leibniz’s doctrine of monads. According to Leibniz, there are no windows in monads, because the perception of the universe happens through infinity. The effect is that two monads never experience their own reality exactly as the same.

Leibniz imagined the world as an infinite number of infinitely small units of force, called monads, each of which is a closed word but which mirrors all the other monads in its own system of perceptions. All monads are spiritual entities, but those with the most confused perceptions form inanimate objects and those with the clearest perceptions, including self-consciousness and reason, constitute the souls and minds of humanity. God is the Monad of monads, who creates all other monads and predestinates

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31 Against Heim, it must be argued that his law of disjunction is not universal. According to Heim, the law is valid in every polar space but not in the supra-polar space. However, we can live without knowing it in many spaces simultaneously. In the universe, where we could move at the speed of light, time contracts to become infinitely short but not zero. The law of disjunction is valid in this case. See Nevanlinna, *Suhteellisuusteoria*, pp. 320-321. However, in W-space, this is not valid, because in it time is eternal. I can imagine that I am in many places simultaneously. For example, in Gödel’s universe, where by making a round trip on a rocket ship in a sufficiently wide curve, it is possible to travel into any region of the past, present, and future, and back again. See Kaku, *Hyperspace*, pp. 240-251. In propositional logic “or” and in predicative logic, “exist” correspond to each other, if the set of beings is finite. In an infinite set, there is not full correspondence. The same is valid concerning the words “and” or “all.” According to Heim, physical time-space is infinite. Therefore, he cannot inductively conclude that sometime in the future there will be or in the past there has been no occasion in which the being “I” is simultaneously in many places.

32 *GD*, pp. 82-88.
their development in accordance with a preestablished harmony that results in the interaction between monads.\textsuperscript{33} Heim argued that it is impossible to explain any universally applicable rule about the structure of t-space because its type and dimension can be anything. In every case, it has a perspectival center, and its relation with other spaces is polar.

Heim’s picture of t-space could be presented by following propositions: t-space is material and objectifiable phenomenal space of “your consciousness.” The perspectival center of t-space is T-space. The existence of t-space is polar.

The spaces “i” and “t” are formally similar but they are not identical. Both spaces are objectifiable, and they belong to reality, which Heim called “world-space” (\textit{Weltraum}). In this dissertation, for reasons discussed above, we will use the term “w-space.” What is the exact meaning of w-space? This question is an interesting part in Heim’s dimensional thinking because w-space is reality or the universe, which is the object of science.\textsuperscript{34}

We have stated that, according to Heim, I: i = W: w and (I & T) \(\subset\) W. In the same way, Heim presupposed that also (i & t) \(\subset\) w is valid. He argued that his presupposition is contradictory to common sense, but that is usual in science. For example in geometry, the illustration of kinematics in the three-dimensional Euclidean space is done with help of four-dimensional event-coordinates, in which time is the fourth dimension. Einstein fulfilled the program, initiated sixty years earlier by Riemann, to use higher dimensions to simplify the laws of the universe. In the same way, in three-value logic, the so-called proof of independence must be done from the “larger perspective,” that means, from four-value logic. w-space is non-viewable and poly-dimensional (\textit{übergreifender}) as compared to its limitless and infinite part-spaces “i” and “t,” which are four-dimensional. In every case, w-space is the same as w-reality, in which the secondary coming or the temporal succession of “become” prevails in the continuum of

\textsuperscript{33} Saarnio, \textit{Mitä tiedämme äärettömästä}, pp. 19-20, 40. 
\textsuperscript{34} \textit{GD}, pp. 87-88, 117-127.
physical time. Thus, w-reality is at least four-dimensional space, from which three-dimensional reality of common sense could be described.  

The secondary “become” is the object of science and history. Like Husserl, Heim thought that the objectifiable thing is always passed the present and become the invariable entity. At the same time, it moves continuously away toward the past when new events pass the present and push it farther back in physical time. However, it is impossible to say that the past has been, and is now definitively over. This mistake occurs, if “I” is detached from physical time. Thus, only the present is real, and all others are either “no more” or “not yet.” The opposite poles of W- and w-reality form the synthesis: W→w→W, which means that the event that has passed the present, returns to the present for its potential, either positive or negative, energy. Heim’s example of this proposition is the feeling of guilt.

Heim’s picture of w-space could be presented in the following propositions: w-space is a material, objectifiable, and invariable world-space of our consciousness. In w-space prevails inclusion $(i \& t) \subset w$. The existence of w-space is polar.

### B. Dimensional Boundaries

According to Heim, there are three basic relations in the “I-Thou-it” world: $i/t$, $I/i$, and $I/T$, which form an inseparable unity. From the viewpoint of “I,” the three dimensional boundaries correspond to these relations. The dimensional boundary is between i- and t-spaces, between I- and i-spaces, and between I- and T-spaces. 

The first issue to solve concerns what kind of relation prevails between the world experienced by myself, “i,” and the world experienced by you, “t,” that is, what kind is the boundary of “i/t.”

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35 Nevanlinna, *Suhteellisuusteoria*, p. 171, and Kaku, *Hyperspace*, pp. 98, 104-105. According to Heim’s definition, every space is an infinite continuum. However, w-space cannot be infinite if it is exactly same as G-reality, because the universe is finite but limitless.

36 Heim referred to Husserl’s *Vorlesungen zur Phänomenologie des inneren Zeitbewusstseins* in his *GD*, p. 109.

37 According to Heim’s definition of the dimensional boundary, it prevails between any two spaces no matter the type or dimension of spaces. Therefore, one should realize that between spaces I, T, W, i, t, and w, could be fifteen dimensional boundaries, and from the viewpoint of “I” five, not just three.
Our common experience is that these worlds are absolutely closed to each other. No one can see directly what others see but we can indirectly make conclusions based on reactions of others. However, there are always “dead spots” in which “I” is like a “Lone Ranger.” The reason is neither unwillingness nor apathy but the basic quality of this relation. Between i- and t-space, there is a dimensional boundary, not a boundary of content. The boundary of content means that “i” and “t” are one and the same space in which there are two comparable rooms, whereas the dimensional boundary means that “I” and “T” exist in two different spaces, either here or there but not in both spaces simultaneously. It is impossible to see any point of boundary between “i” and “t” because both are limitless. However, between these spaces is a “boundary,” the paradoxical dimensional boundary. The “paradox” means that there is an unresolved dissonance between “i” and “t.”

Rudolf Carnap, a member of Vienna Circle, tried to resolve this dissonance by using the fourth basic proposition of logical empirism, the so-called principle of logical behaviorism. He tried to resolve the dissonance between “i” and “t” at the level of scientific invariance. Phenomenal φ-sentences, which describe immediate experiences of “T,” are intersubjectively identical with physical f-sentences, which describe bodily conditions of “T.” According to Heim, it is impossible to resolve the problem at the three-dimensional or even four-dimensional level of “i” and “t.” It could be possible only in the level of “w,” from which the whole reality can be described exactly and without remainders. However, human beings cannot do it, because of the dimensional boundary between “i/-” and “w/-” spaces.

The second issue is what kind of boundary separates me from my own world, that is, what kind is the boundary of “I/i.” I-space is non-objectifiable, whereas i-space is an objectifiable continuum. Because both are spaces, the boundary of content cannot prevail between them. Only the dimensional boundary can. The boundary of content means that “I” and “i” are the same space, which is impossible. A simple optical fact proves this situation: the seeing point itself is unseen. Between “I” and “i” or, in other words,

38 *GD*, pp. 82-88.
between subject and object is always a certain distance because they belong to different spaces, and therefore, a dimensional boundary prevails between them. 40

According to Heim, the distance between I-space and i-space is temporal. Because physical time is objectifiable, it must mean that the boundary of content prevails between these spaces that is impossible according to the definition of boundary. There is a possible solution to this confusion. The boundary between “I” and “i” is a boundary of content only in the case that “I” and “i” are contents of a space, but because they are two different spaces, “I” and “i” must be in the relation of dimensional subordination: (I & i) ⊂ i, as was discussed in the previous Chapter. 41

The dimensional boundary is always paradoxical because it is possible to know only by the way of synthetic a priori. In this case, the sentences “I am in the world” or “My existence is to be in the world” (in-der-Welt-Sein) are contential. The existence of “I” (Dasein) and its relation with “i” are as fully different as the existence of a thing-world (Vorhandensein) and the relation between things (Einandergegenüberstehen).

Heidegger separated the physical and existential modes of existence (Seinsmodi), but this separation is insufficient. We must resolve in what meaning we do use the prepositions “in” and “towards.” According to Heim, it is possible to use each of them in the meaning of content, and of dimension. The paradox of dimensionality in the relation between “I” and “i” appears clearly in a situation in which “I” sees the opposites of the experienced world together. It is a point from which two consecutive events are experienced simultaneously. Heim referred to Kant, who argued that the experience is possible only in this way. 42 Concerning contents, this is contradictory, because the conjunction “and” and the disjunction “or” are non-connectable. Dimensionally there is no contradiction, because of the statement I: i = W: w. In other words, both relations are two different aspects of the same reality, or they are the same dimensional relation seen from two complementary aspects. W and w are opposites of each other, and “I” and “i” are in the relation of subject-object to each other. Either-or and both-and are thus dimensionally complementary.

40 GD, pp. 98-105, 117-128.
41 See Chapter II.1.D.
42 Heim argued with Kant’s doctrine of “Synthesis der transzendentalen Apperzeption”.
In Heim’s dimensional thinking, it is possible that W and w form a synthesis, which could be formalized as “W ↔ w.” Moreover, between “I” and “i” prevails the dimensional subordination of I ⊂ i. Because subject and object cannot be absolute, “I” and “i” belong inseparably together. However, they cannot be identical, because “I” is non-objectifiable, and “i” is objectifiable. Heim argued that i-space has two modes. It is both phenomenal or consciousness-space (Bewusstseinsraum) and physical space (Gegenstandswelt). If i-space as physical space were absolute, it would not exist, and the consciousness-space would be the only possible mode of “i.” However, if i-space as physical space is relative, it is possible to avoid this contradiction. Thus, the synthesis I↔i is relative, and in it prevail the unity and the difference of phenomenal and physical reality.43

The third issue Heim addressed is how the invisible, knowing and willing subjects “I and Thou” relate to each other, that is, what kind is the boundary of “I/T.”44 They both belong to the limitless spaces “i” and “t” as perspectival centers of them. There are thus two simultaneously valid propositions: “You are infinitely far from me,” and “You are infinitely near me.” Contentiously, “I” and “T” could be two contents of the same space, but then these sentences would be contradictory. The boundary of content means that the law of bivalence prevails between contents of the same space. Only dimensionally are these propositions consistent, because “I” and “T” are two limitless and infinite spaces whose boundary is always dimensional.

The dimensional boundary I/T is of a different kind, as is the dimensional boundary i/t. In the basic proposition “I-it,” “I” is the subject who experiences and uses the object, whereas in the basic proposition “I-Thou,” “I” is the conscious person who cannot experience and use “Thou.” I cannot speak about you by using “it,” because “Thou” is non-objectifiable. It is possible to use the word “it” concerning “I” and “Thou” in an indirect or “inauthentic” meaning, but not in a direct or “authentic” meaning.45 Together, “I” and “T” can be only in an intentional relation, as Martin Buber argued. In

43 WnW, pp. 50-65.
44 GD, pp. 140-151, and GN, pp. 67-77.
45 GD, pp. 148-151. The concept of “authentic” and “inauthentic” are from Heidegger, see Chapter I.2.
this relation, “T” exits as constituted by “T,” and vice versa, because their existence is existential.\textsuperscript{46}

C. Dimensional Unity and Difference

Between spaces does not prevail only the dimensional boundary “I/t,” “I/i,” and “I/T,” but also the relation of the dimensional unity and difference.\textsuperscript{47}

The limitless phenomenal spaces “i” and “t” cannot exist side by side in empty space because it is impossible to find a shared boundary of content between them. These spaces are in an exclusive (i \neq t) relation with each other. In addition, they are different spaces in the absolute meaning. However, they are identical (i = t) in a certain invisible way. It is possible only to explain paradoxically their identity: i- and t-spaces are two different world-views about the same reality, because, as spaces, they are infinite. In a practical sense, this situation presents a conflict between them, because they both demand sovereignty.

According to this epistemological antinomy, although I, as a knowing subject, cannot go over my own shadow or subjective limits, I know certainly, that there is an object beyond my consciousness, to which my knowledge-act is directed. In Heim’s opinion, the paradoxical dimensional unity in the difference between “i” and “t” is the key to solve this epistemological antinomy. Heim argued that the origin of this antinomy is the notion that I know that beyond my subjectivity exists objectivity, to which my knowing is intentionally directed, because I also know that my consciousness is not the only consciousness. The solution to this antinomy is, according to Heim, that the boundary between subjectivity and objectivity is dimensional. My consciousness is subjective, because “I” belong to it. However, it is also objective, because my knowledge-act is directed toward reality, which is the same for all subjects. The problem

\textsuperscript{46} Heim directly quoted Martin Buber’s book, \textit{Ich und Du}. See \textit{GD}, pp. 140-143.
\textsuperscript{47} \textit{GD}, pp. 88-90, 128-133, 151-153.
is that I can never reach objective reality, because the dimensional boundary exists between subject and object. Objective reality can only passively open upon my ego.\[48\]

In his solution to the antinomy found in the relation of subject and object, Heim referred to Nicolai Hartmann’s book *Grundzüge einer Metaphysik der Erkenntnis*. According to Hartmann’s critical realism, a boundary (Objektionsgrenze) exists between subject and object, and crossing it means “knowing of non-knowing” (Wissen des Nichtwissens). Beyond this zone is another boundary (Erkennbarkeitsgrenze), and beyond it is an irrational or transintelligible zone. The knowledge of it is, nevertheless, possible because subject and object belong to the same reality. The transcendence of the object gradually collapses into the relation of different subjects to it and to each other. The difference between Heim and Hartmann is, however, that subject and object in Heim’s ontology belong to different spaces within same reality.\[49\]

The present I-space and past i-space cannot be two space-continuums in an adjacent and conjunctive relation, but they can be in an exclusive and disjunctive relation. However, in this exclusive relation they constitute an invisible unity: they both include the same reality but are seen from two opposite aspects. The origin of “I” is not from the supernatural space but from this world. I am of the world. I am not an alien in the world (welt-fremd), and the world is not strange to me (ich-fremd).\[50\] Nevertheless, Heim sometimes thought that the origin of “I” is from the supra-polar space of God. When Heim rejected idealism for realism, idealism also continued to influence in Heim’s thinking. The reason is obviously that Heim’s purpose was to unify them.\[51\]

The dimensional difference “I ≠ i” corresponds to our common sense, but the dimensional unity “I = i” is problematic. Heim argued that “I = i” appears as merely speculation, as long as content and dimension are mixed. If “I” and “i” are contents of the same reality, the argument is absurd because it means that “I” and “i” are two different objects of experience within the same space. Dimensionally, however, the

\[48\] There is no epistemological antinomy of the relation subject and object in the extreme forms of realism and idealism, that is, in naïve realism and in solipsism. The antinomy exists somewhere between these poles, and it originates from the attempt to unify realism and idealism. Heim tried to unify them. He also argued that subject can “reach” the object over the dimensional boundary. *GD*, pp. 132-133.

\[49\] About Hartmann, see Stegmüller, *Hauptströmungen*, pp. 245-254.

\[50\] *GD*, pp. 128-133.

\[51\] *GN*, pp. 191-196.
argument is meaningful and without contradiction because “I” only is the subject, and “i” only is the object that is separated from the subject by a dimensional boundary. Thus, the argument that an object and its representation are identical is meaningless and contradictory. Heim’s proof is a contra-position: \((\neg T \rightarrow \neg P) \rightarrow (P \rightarrow T)\), in which theorem \(T\) is \(I = i\), and premise \(P\) is \(o = r\) (object = representation). The conclusion is identically true. However, although this conclusion is logically true, it can be factually false, if \(P\) is false. From a false premise can logically follow anything, because a false sentence can imply all sentences.

The dimensional difference (\(I \neq T\)) means that between present spaces “I” and “T” is an exclusive disjunction: either “I” or “T.” “I” can be in the same moment only in one place, because singularity is its essence. Thus, dimensional unity (\(I = T\)) means that both “I” and “T” want to be at the same “I-place” (Ich-Stelle) or the perspectival center of reality. The demand to make absolute my own world-view is visible in the field of knowledge, willing and action. The demand cannot, nevertheless, remove the prevailing disharmony between “I” and “T.” Only the honest concession of difference and the honoring of “Thou” can lead to the real meeting of “I” and “Thou.” Thus, either the world-view of “I” is true or the world-view of “Thou” is true. In either case, the perspectival center of reality is the same for both “I” and “Thou”. It constitutes the dimensional spot of identity, which combines the once exclusive I-space and T-space. In fact, Heim’s conception of dimensional unity and difference was an important part in his endeavor to combine idealism and realism.  

53 GD, pp. 151-153. The dimensional spot of identity (Ich-Stelle), in which \(I= T\), is problematic because no one knows where it is. Is it in “I” or in “T,” in “I” and “T,” or beyond “I” and “T”? In Heim’s opinion, it can be in both “I” and “T,” thus, in “W”-space. In the psychology of identity, this kind “spot” can exist in every above-mentioned place. There are two types of identity: “public identity” and “self-identity.” The first means that I have as many social “I” as there are people who know me, that is, I have an objective public identity. The other people see me as a certain kind of person, and I see my own effect on other people, that is, I have a subjective public identity. The second means that in any given moment, my identity actually is seen, but not my whole identity, that is, I have an actual identity. I have also invisible potential capacities, that is, I have a potential identity, or I want to be something else what I am, that is, I have an ideal identity. Another difficult issue concerns, how identification occurs. Heim argued that it occurs by honoring “Thou,” but this notion is vague. The imitation is directed to the similarities of the public behavior of the subject and its model, whereas identification is directed to the similarities of meaning.
D. Dimensional Part-relation

The dimensional boundary and a unity and difference prevail between spaces “i” and “t,” “I” and “i,” and “I” and “T.” The dimensional relation of parts or dimensional inclusion and subordination also occupy a position between these spaces.  

Dimensional coordination prevails between i-space and t-space, because their number of dimension, in principle, is the same. This is possible only if there is a space with which “i” and “t” are in the relation of dimensional subordination. It is impossible to imagine what kind of subordination this is, but its existence is necessary to assume. In fact, we know exactly as much about this space as about the invisible dimensional unity “i = t.” Namely, it is the space that unites spaces “i” and “t” into w-space or world-space (Weltraum), as was discussed above. Dimensional part-relation between i-space and t-spaces could be explained as the following sentence: (i & t) ⊂ w.  

Dimensional coordination prevails between the present I-space and the past i-space. This is possible as a relation of parts of “I” and “i,” only if there is a space in which “I” and “i” are in the relation of dimensional subordination. Both my world and I, or the limitless I-space and i-space, belong to “space of my consciousness” (Bewusstseinswelt), which is i-space. In this space, I can experience at every moment the disjunctive relation of “becoming” (Werden) and “become” (Geworden), that is, the conflict between will and action.

Dimensional part-relation between I-space and i-space is the most paradoxical. In fact, it is a contradiction if we think that “I” and “i” are contents of the same space, because i-space is an object, and thus, it cannot include itself and its observer. The solution to this contradiction is the dimensional presupposition that “i-space” has two meanings: phenomenal and physical. The physical meaning leads to contradiction, but the phenomenal meaning avoids it. Heim’s mistake here was that he did not explain when i-space is physical or phenomenal. If the i-space is only phenomenal, it means that there is no physical reality. In that case, Heim’s endeavor to combine idealism and realism failed and leads to solipsism. Realism lost, and idealism overcame, as was

54 GD, pp. 91, 133-134, 153.
55 Chapter III.1.A.
discussed above. Dimensional part-relation between “I” and “i” could be explained as the following sentence: (I & i) ⊂ i. 56

The spaces of the eternal “becoming” or present, “I” and “T,” are not only parts of the spaces of the “become,” “i” and “t,” and their combination w-space which is the first, physical dimension of time, but they also belong to W-space, where they exist in a relation of dimensional coordination with each other, and in a relation of subordination of W-space, which is the second, eternal dimension of time, as was discussed above. Dimensional part-relation between I-space and T-space could be explained as the following sentence: (I & T) ⊂ W. 57

E. Dimensional Confrontation or Meeting

Between spaces “i” and “t,” “I” and “i,” and “I” and “T” prevails the dimensional boundary, unity and difference, and part-relation, as does the dimensional confrontation or meeting.58

Heim’s problem was to show how it is possible that two limitless and infinite spaces can open upon each other. The answer can be discovered only if we at first analyze an analogy to the visible world. In the same limitless and infinite space, two contents or objects can touch each other. However, two spaces, which are in a relation of dimensional coordination, cannot touch each other like objects. They have no visible boundary. However, they have a certain common zone of confrontation, where they invade each other in a space, within which they are in a relation of subordination to one another. The same situation must prevail between i- and t-space, which are in a relation of coordination with each other, and in a relation of subordination with w-space. This situation cannot be illustrated, because i-space is four-dimensional, and w-space is n-dimensional. The condition of visibility in this case is that the spaces have the same dimensional number. Visibility could be possible if i-space were also similarly n-dimensional, as w-space is, but this is impossible.

56 Ibid.
57 Ibid.
58 GD, pp. 92-97, 134-138, 153-161. The term “confrontation” describes the negative or disharmonious aspect, and “meeting” the positive or harmonious aspect between spaces.
The mutual invasion through each other of i-space and t-space can be discovered only in one way. I know that in my space or i-space, there exists an invisible place in which a confrontation or meeting occurs with your space or t-space. This place also belongs to t-space. Thus, it has dimensionally an identical content in both spaces, \( i \parallel t \).

However, although the content of the place of meeting is identical, I cannot know, how it is seen from t-space, because I cannot see inside t-space. If there is another meeting place in the i- and t-space, where they both can open upon each other, then the meeting place can be whatever point of i- and t-space, because between them prevails the dimensional unity \( i = t \).

According to Heim, the place of confrontation in i-space between I- and i-space cannot be anything else but the perspectival center point from which reality is seen. This point has a paradoxical feature. On the one hand, it is not any point but the invisible and non-objectifiable blind point in the world-view. On the other hand, it is at every moment becoming to a point, which has a certain place in the time-space continuum. Thus, the dimensional confrontation of I- and i-space is the relation of temporal transition, \( I \parallel i \).

The timeless and eternal zero-point changes to the center of the continuum of time. This point has two faces: one is looking at the present, the other at the past. Heidegger argued that existence itself is a process from the timeless and non-local situation to the temporal and local situation (Geworfensein in das Da). In Heim’s words, Heidegger claimed that I-space changes to i-space. In the dimensional doctrine of Heim, it is impossible, because I-space has no content, and I- and i-space are two polar, eternal, and temporal aspects of the same reality.\(^{59}\)

\( I \parallel T \) is the temporal relation of transition. Inside this event, there is a basic distinction (Urunterscheidung) that is inexplicable and undefined. It is impossible to resolve this paradox by thinking that “I” and “T” are contents of a space without getting into circular reasoning. The only possibility is to note that all happening is dimensionally both action and passion. Action and passion cannot belong to w-reality or the secondary becoming of w-space, because all “become” has already happened. Thus, they must necessary belong to W-reality or the primary “becoming” of W-space. In fact, action and

\(^{59}\) About Heidegger’s thought, see Stegmüller, Hauptströmungen, pp. 142-145.
passion are two ways or qualities of W-reality. In the confrontation of I- and T-space, both become conscious of disharmony between them \textit{in actu}: I-action equals T-passion, and T-action equals I-passion. My will causes suffering for you, and vice versa. According to Heim, the disharmony between the will and the counter-will can change to harmony in two ways: if either one of them resigns itself to the other, or if both are equal to each other. “I” and “T” cannot meet each other universally, but only event by event.

Heim’s answer to the problem, where is the place of meeting or confrontation between I- and T-space, is simple: because “I” and “i” belong inseparably together, also I | T and i | t formulate an inseparable unity. One of the most important places of confrontation is a word, which belongs already as spoken, written, and printed word in w-space, and as a just occurring act in W-space. When I, for example, hear a word, both the confrontation I | T and i | t occur, but only I | T means the action and passion. In other words, I hear a word (passion), which you say (action), and vice versa. According to Heim, it is necessary to realize that not all utterances mean the real and personal meeting between “I” and “Thou,” but rather a real confrontation or conflict between them. For example, a scientific discussion leads seldom to a personal meeting of minds. On the other hand, someone dead can meet me now in such way that I experience him/her as a will, who has power to guide me toward the certain solution in my situation.

According to Heim, the real I | T can happen only in W-space, whereas the meeting or confrontation of “I” and “Thou” always occurs, when i | t. This is the situation in our world. However, Heim presupposed that the same situation prevails also between the living and the dead. In other words, Heim argued that there are other T-spaces whose centers are constants without variables. Are they polar or supra-polar? Heim did not answer.\footnote{About this issue, see the discussion in the next chapter “Supra-Polarity.”}
F. Dimensional Knowledge

The knowing of the dimensional boundary, of unity and difference, of part-relation, and of confrontation or meeting between spaces “i” and “t,” “I” and “i,” and “I” and “T” can be discovered only dimensionally. According to Heim, the knowing act (i ▷ t) of “I” as a perspective center is \textit{a posteriori} if is directed toward the contents of i-space. Thus, it is possible to perceive and to make inductive conclusions from contents. On the other hand, the knowing act that is directed toward the unknown t-space cannot occur as content within a space because it is impossible inductively to conclude its content. This knowing way can be only a dimensional or synthetic \textit{a priori} knowing between spaces. We can immediately be conscious of the existence of t-space and its principle of order when it opens upon us.

Heim’s argument leads to some contradictions. For example, it is impossible to understand Heim’s thought by \textit{a posteriori} at all but only by synthetic \textit{a priori}, if (or when) it opens upon someone. Kant tried, but never succeeded, to find a sufficient solution to the issue of synthetic judgments \textit{a priori}, how such judgments are possible, or, in other words, how can we have \textit{a priori} knowledge of propositions in which the predicate concept is not part of the subject concept. Kant’s solution was that something must be the basis of synthetic judgments \textit{a priori}, how such judgments are possible. Thus, it has to be intuitions, such as empirical intuitions of the sort that Hume liked. Nevertheless, we have now discovered that some synthetic judgments are \textit{a priori}, so they cannot be based on empirical intuition. Hence, there must be a very special non-empirical sort of intuition – let us simply call it “pure intuition.” However, Heim did not think about the judgments of contents of synthetic \textit{a priori}, but in his dimensional thinking, these are synthetic \textit{a priori} events in two-dimensional time-space.

The knowing act (I ▷ i), which is directed toward i-space, is dimensional, because the dimensional boundary is between I-space and i-space. It means, for example, that the propositions “I exist behind the objective world as a subject who makes observations” or “The invisible will exists behind its action,” are synthetic propositions \textit{a priori}. I know

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absolutely that i- and I-space are different spaces, which have their own structural laws and principles of order. According to Heim, because \((I \cup i) \subseteq i\), the knowing act directed toward the i-space, can be only dimensional. If it concerns also contents, it would be contradictory with the argument \(i \not\subseteq t\), as was discussed above.\(^{63}\)

The common sense way to know is not possible concerning the relation between I-space and T-space. The dimensional way to know \((I \not\subseteq T)\) is primary in this case. Only dimensionally can we realize the structural laws and principles of order of spaces. Because T-space is transcendental toward I-space, the knowing act toward it, and vice versa, is dimensional.

The dimensional way of knowing corresponds to the existential way of talking. I explain by words an existential proposition from my space (I-space) about myself (i-space). You hear it, and either understand or misunderstand it from your space (T-space). From the correspondence of dimensional way of knowing and existential way of talking, Heim concluded that the existence of “I” and “Thou” is existential. From it follows that the so-called absolute ego of the German speculative idealists was a fiction.\(^{64}\)

2. Supra-polar Space

We have defined the concept of supra-polarity in chapter II.3.B, and noticed that it is genuine transcendence. Supra-polar space differs from the intra-mundane relations of transcendence in that its content and dimension are not spatially transcendent, but it is every moment present in the every polar space. According to Heim, this supra-polar space was God’s space. However, sometimes Heim argued that it was not only God’s space but also the space of Satan, of will, and of faith, which also have a supra-polar quality.

We must first analyze the intension of the space of God, the necessity of God’s supra-polarity, Heim’s idea of God and His eternal presence, and how God’s supra-polar space can open upon us. Then we must analyze the intension of all other supra-polar

\(^{63}\) See Chapter III.1.F.

\(^{64}\) GD, pp. 150-152.
spaces, namely, those of Satan, and Heim’s idea of the supra-polar character of will and of faith.

A. Space of God

As we have discussed in the Chapter II, if God exists at all, He alone must be the supra-polar Being, and if there is supra-polar space, it must be God’s space. Because it is space, it opens upon us in the same way as the polar spaces, if at all. We must first analyze Heim’s arguments on the necessity of God’s supra-polarity. After that, we can understand God-space itself, and its opening.

Heim’s argument for the necessity of God’s supra-polarity starts from the two questions of every thinking and willing person: “Where does it all come from?” and “What is the last legitimization or sanction of our actions?” There are three answers to each of these questions. These six answers are also three forms of human religiosity and morality. The three answers to the first question “Where does all come from?” are the following:

First in the sequence of cause and effect, we go backwards until we find a cause, on which we could explain everything. This kind of first cause, prima causa, or primus movens, is either scientific, for example, “singularity,” or mythological, for example, a “demiurge.” Heim called this solution “worship of the created” (Kreaturenvergötterung). However, this solution is inadequate, because physical time-space is an infinite and polar continuum. We could thus always continue asking the next question “What is the beginning of this beginning?” Heim’s concept of physical time oscillated with Kant’s first antinomy. The universe has a beginning in time, or it has no beginning. Both are logically true. Therefore, Heim’s physical time is sometimes infinite space, like here; sometimes it is finite but limitless space. In every case, Heim agreed with the universal law in science ex nihilo nil fit.

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65 GD, pp. 76-77, 172-207, JH, pp. 8-46, and GN, pp. 154-169. According to Peter van Inwangen, God, Knowledge, and Mystery. Essays in Philosophical Theology (New York: Cornell University Press, 1995), p. 13, there is such a thing as logical necessity and impossibility but not possibility. A state of affairs is logically necessary if and only if its negation is logically impossible.

66 WW, p. 37. Heim, thus, rejected creation ex nihilo scientifically impossible.
There is no first cause, but the infinite sequence of cause and effect that creates itself. Heim called this solution “pantheism.” According to Heim, the nihilism of Nietzsche represents the mythological form of pantheism in which the universe is eternal. Kant’s critical idealism and especially Vaihinger’s fictionalism represents the critical form of pantheism in which the direction of the sequence of cause and effect is determined by an imaginary point, *focus imaginarius*. However, this kind of intuitive or fictional point is only a regulative principle or postulate, which cannot lead out of polarity.

The sequence of cause and effect continues until the so-called condition of indifference, in which all opposites are combined into a unity. Heim called this solution “indifference-religion.” Eastern mysticism is an endeavor to eliminate boundaries between subject and object, and then reduce the numerous subjects to one transsubjective reality. This kind of unity or *coincidentia oppositorum* eliminates the boundary between dream and reality, but it cannot lead out of polarity, because it is a part of polarity. Heim’s own former concept of transperspectivity, which was the basis in his *GG*, does not lead out of polarity, either. It is identical with the transsubjectivity of eastern mysticism, because according to Heim, perspectivity equals subjectivity.

The second question “What is the last legitimization or sanction of the action and the direction of life?” is more important to Heim than the former question, although both belong together. The will as the last instance can exist only in W-reality, never in w-reality, to which all world-interpretations belong. The three answers to this question are as follows:

The last instance must be some “Thou,” which belongs to W-space, and whose will is stronger than my will, because my own commands are not absolute. However, this solution is a *circulus vitiosus*, because I give you the authority to rule me, but I want to obey you as long as I think you are stronger than I am. The sequence can be continued infinitely.

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67 Saarnio, *Das Dasein Gottes*, pp. 20-61, claimed that God’s existence is a categorically necessary fact in Kant’s epistemology. The question is what kind God is this logically proved, epistemological, and categorical god.
The last instance is the infinite W-space. Then we must ask, from where has it received its legitimization? It can be neither the necessity of history nor the necessity of nature and biological evolution, which are polar entities.

The last instance is the transsubjective and absolute “I” (*All-Ich*), which resides behind W-space. This solution from the German absolute idealism corresponded with Heim’s earlier thinking, but it cannot lead us out of polarity, either.

Kant had claimed that the categorical imperative of his autonomous ethics is adequate and universal, whether God exists or not. According to Heim, Kant’s categorical imperative is not adequate and universal, because I can always change it. The absolute law of ethics requires necessarily a supra-polar stance. The above-mentioned solutions lead to purpose, which corresponds exactly to the force that is necessary to achieve that purpose. These solutions only prove the boundary, which we cannot cross. Here is the “transcendental horizon” of Heim’s dimensional thinking. There is no theoretical or practical thought, belief, or proof, which can lead out of the polar spaces, and all attempts to try to escape from polarity are a *petitio principii*. Heim opposed Kant’s argument about noumena. Kant had argued in his *Critique of Practical Reason* that the realm of noumena, in which the categories have been technically inoperative, becomes thinkable as a realm of intelligible reality that is available to us in a world distinct from the world of sensible nature. Thus, a dualistic metaphysics emerges and is offered as a solution to contradiction between natural determinism and ethical freedom. Kantian dualism includes a mode to think of, but not know, the existence of the “soul,” “God,” “immortality,” and “free will.”

According to Heim, however, something requires that polarity cannot be the only possible reality. The something is prayer, which is not monologue but dialogue with God. The prayer is some kind of *ultima ratio* that proves that, if God exists at all, He must have necessarily a supra-polar character on which His omnipresence and omnipotence is possible. Therefore, it is logically impossible that God is not supra-polar. The supra-polarity, the “second Copernican revolution” discovered by Heim, has been the target of heavy criticism and regrettable misunderstanding. It has had very few

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supporters, or even persons who have understood it correctly. The arguments against Heim’s supra-polarity usually start from the argument, which in itself is also metaphysical, that there is no bridge from science and knowledge to faith. The crossing into faith is possible only by postulating new thinkable entities (as Kant did) or by a jump of the soul (Seelensprung), not by continuously concluding.\textsuperscript{69}

According to Hans-Rudolf Müller-Schwefe, Heim’s thinking must be understood as metaphysical. Because it is metaphysical, Heim could see and use concepts of thinking and believing harmoniously. Thinking was not “memory” (Andenken) for Heim, as it was for Heidegger, but “design in advance” (Vorausentwerfen), which was followed by realization.\textsuperscript{70} According to Friso Melzer, Heim even did not try to prove (beweisen) the supra-polarity of God but only to give a testimony (bezeugen) to it.\textsuperscript{71} Osmo Tiilikä argued that Heim’s endeavor was only to prove the consistency between faith and knowledge, not to translate truths of faith into truths of reason. The same polar reality, which is an object of science, is imagined in a totally new dimension, when it is seen in the light of faith, which is conscious of the supra-polarity.\textsuperscript{72} Walter Künneth argued that Heim’s basic attitude is not “science contra belief” but “unbelief contra belief.”\textsuperscript{73} Paul L. Holmer argued against Heim, “It is not at all clear how this ‘non-objective,’ ‘non-polar space’ is known to be actual. That the words have a use in Heim’s writings cannot be denied. However, the point is that he does not admit that he is expressing an attitude or re-aligning the known facts about nature and people to cohere more satisfactorily to his intention. The words about non-polar space are used as if they were descriptive… whether or not there is an objective reference to metaphysical language.” Holmer also

\textsuperscript{69} For example, Arthur Neuberg in Theologische Literaturzeitung 77 (1952), p. 307, argued that Heim’s proof is inadequate. “Woher weiss man denn, dass Gott überpolar ist und nicht polar ist…Denn Übergang zum Glauben ist nur durch Seelensprung zu erreichen, nicht durch kontinuierlichen Schlussketten. Es gibt keine sichere Denkbrücke zwischen Glauben und Wissenschaft.”


\textsuperscript{72} Osmo Tiilikä, Systemaattinen teologia I (Kuopio, 1951), pp. 68-70.

argued that Heim tried to construct a metaphysical structure, which is already vulnerable even without waiting for future scientific discoveries. Nevertheless, Heim’s critics have not realized that Heim consistently proved the logical impossibility of all kinds polar proofs about God’s existence. His dimensional thinking shows without contradiction that there is a transcendental horizon, which cannot be crossed by any knowledge, thinking, or believing.

Ingmar Holmstrand argued against Heim’s concept of transcendence. What is the connection or distinction between the polar and the supra-polar reality? Is it a discontinuity or continuity? If continuity is accentuated, then the transcendence of the supra-polar space is not a real or genuine transcendence, and the doctrine of analogia entis must be rejected. The problem is, however, what is the boundary that prevails between polar spaces and the supra-polar space? It can be neither the boundary of content nor of dimension. Because Heim used the words “abolish” or “nullify” (Aufhebung), it may be a new type of boundary. Holmstrand argued that “but if the continuity-aspect is not preferred, then Heim’s theological program as a whole becomes unnecessary and his apologetics unreasonable, at least concerning the problem of God’s transcendence… But if the continuity-interpretation is accepted, then Heim’s theological program becomes very natural.” The second interesting feature in Holmstrand’s analysis was that he saw similarities between Heim’s concept of supra-polarity and Kuhn’s theory of paradigm. Heim’s dimensional thinking and especially his “second Copernican turn,” the concept of supra-polarity, can be seen as a theory of paradigm. I argue that without the necessity of God’s supra-polarity, which is continuous to polarity, Heim’s thinking does not differ from Barth’s theology at all. Moreover, God’s revelation in Christ’s incarnation presupposes the continuity between the supra-polar and polar reality. Without continuity, God’s revelation is meaningless.

74 Paul L. Holmer, “Karl Heim and the Sacrifice of Intellect,” in Lutheran Quarterly, 6 (1954), pp. 207-219. Holmer’s analysis of Heim was not about GD but only GN and WnW. In addition, Holmer claimed, for example, that ego is “non-polar,” which is false. Altogether, Holmer did not understand the motif of Heim’s dimensional thinking, because he thought that Heim tried to prove God’s existence.

75 Holmstrand, Karl Heim on Philosophy, Science and the Transcendence of God, pp. 132-140. See also claims of Daniel W. Hackmann, “Die Bedeutung von Karl Heims Begriffspaar ‘polar’ und ‘überpolar’ für das Gespräch zwischen Theologie und Naturwissenschaft,” in GDJ (1993), pp. 32-51, that both continuity and discontinuity prevail between polarity and supra-polarity in Heim’s dimensional doctrine.
Although Heim argued that supra-polar space is God’s space, this concept is not the old trick by which God and world are closed under the same denominator and imagined through an *analogia entis*. The issue is reversed: God’s eternal presence disproves the principle of *analogia entis*. As Kant argued, space is not an *ens* or a thing-in-itself (*Ding an sich*) but a relation (*Beziehung*) between the observer and reality. In the same way, because language is not the content of a book but its form, through which the content becomes clear to the reader, then also the supra-polar space is not God but only the aspect that is turned toward us.  

Supra-polar space is, in fact, the fifth type of space, and the boundary between it and polar reality is the third type of boundary, which is neither the boundary of content nor of dimension. What kind of boundary is it? Heim did not clearly explain. The only expressions used by Heim are “dead point” (*der tote Punkt*), which is non-dimensional, and the verb “to abolish” (*aufheben*), which means the negation or cancellation of all polar relations.

Heim’s concept of space stated that both God and the world are continuous realities. Thus, God is necessarily not only transcendent but also immanent. God’s supra-polar space can be present every moment in all points of the polar spaces and in all their contents simultaneously because God’s aspect toward polar reality is a supra-polar one. The supra-polarity of God is same as the omnipresence of God. The way from all points to God is as long as or as short as the way from God to these points. Heim argued that this fact does not express pantheism, because God is not identical with polar reality. God is only eternally present in polar reality and at the same time, non-spatially and non-dimensionally beyond it.

According to Heim, time is, on the one hand, the temporal, objectifiable, physical, and polar space. On the other hand, it is the eternal, non-objectifiable, existential space, both polar and supra-polar. Time is eternal, as both polar and supra-polar space, because W-space is a *nunc aeternum*, and God’s supra-polar space is eternity. If this is so, then one of the dimensions of time belongs to polar reality, and the other one to both polar and

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77 The definition of the concept of boundary requires that the boundary between polar spaces and the supra-polar space is dimensional. Only at one time did Heim use “spatial” (dimensional) term in this case. See *WnW*, p. 150: “Es ist vielmehr eine ‘räumliche’ Grenze…”
supra-polar reality. The former is temporal, and the latter is eternal. Because God is the eternal present, and W-space is the panpsychic \textit{nunc aeternum}, W-space must also belong to supra-polar reality or at least participate in it. The crossing point of polar and supra-polar reality is precisely \textit{nunc aeternum}, in which God is both transcendent and immanent, “God with us” (\textit{Immanuel}).

Because Heim referred to Jacob Böhme, N.H. Søe supposed him to be pantheist.\footnote{See Søe, \textit{Religionsfilosofi}, pp. 61-62. Compare \textit{GN}, pp. 196-212.} However, the definition of Heim’s concept of space, in which “infinite” is the most important predicate means that pantheism is impossible. Namely, if God is identical with the world, He could not be omnipresent, and God’s omnipresence could not exist everywhere as wholeness because the universe cannot exist everywhere as wholeness. Therefore, Heim’s supra-polar space is formally some kind of metaphysical infinity, but its content is something else.\footnote{See Saarnio, \textit{Mitä tiedämme äärettömästä?} pp. 14-22.}

His German and English critics usually categorize Heim as an epigone of Karl Barth. In Heim’s thought, there are Barth’s fideistic elements as we have often mentioned, but the logical outcome of his ontology and cosmology is not at all fideistic. It is rather a species of “panentheism.” Panentheism is the belief that the Being of God includes and penetrates the whole universe, so that every part of it exists in Him, but (as against pantheism) this Being is more than, and is not exhausted by, the universe. Panentheism differs on the one hand from theism, according to which God literally transcends the universe as its Creator and on the other hand from pantheism, for which God does not transcend the universe in any sense at all. Heim’s “panpsychism” is the cosmological obverse of that which, theologically considered, is panentheism. If panentheism is true, namely, the only conception of the relation of God to the universe in which the demands of logic, religion, and science are met to some degree that satisfies reason and feeling alike.\footnote{See \textit{The Oxford Dictionary of Christian Church} (New York, 1957). This edition has been updated, but in it are definitions of concepts as used in Heim’s lifetime.}

About God and His supra-polar space, Heim used at least the following terms: “Urraum,” “Ursein,” “Ursprung,” “Uranfang,” “Urwert,” “Urwillen,” “Urkraft,” and “Ur-Du.” These archetypal terms mean that if God exists at all, He is the beginning and the
end of all polar reality. Heim argued that God is the absolute person, from whom the limitles sequence of wills, “I” or “Thou” or so on, begins and to whom it ends. “I am who I am.” (Exodus 3:14). God is omniscient, from whom the limitles sequence of world-aspects, “i” or “t” and so on, begins and to whom it ends. God is the beginning (arkhee) and the end (telos): time-space (Raumzeitlichkeit) begins from Him and ends to Him.81

We live in the archetypal space of God, but it is not God Himself in whom we live. Supra-polar space is the space or relation (Beziehung), in which God is present for us. This ultimate reality remains that which is totally other, totally incomprehensible, and entirely inaccessible to our intuition, thought, and observation. We stand before the infinite, eternal, perfect, and self-existent person, Thou (Ur-Du), in whose omnipresence we all live.82 If God exists, the world is not “all in all,” and if there is something beyond God, God is not “all in all.” An atheist argues that there is only the material world beyond which there is nothing. Panentheist argues that this material world is God’s world. Both world-views are limitless and infinite spaces, but the boundary between them is neither the boundary of content nor of dimension. In other words, there is a battleground (Kampfzone), where both win at every moment. Heim argued that atheistic “secularism” and panentheistic “belief in God” have a supra-polar character. It is possible that both “beliefs” can be present, at least, in every point of W-space, and through that space potentially also in every point of w-space.

In terms of relation of the I-Thou, the problem of transcendence of a polar space into the supra-polar space is the problem of how I can pass from the intuition of you as Thou to the revelation of God as a cosmic Thou. There is but one way from polar reality into supra-polar reality; prayer in faith, which requires that the supra-polar God exist. Praying is not a monologue but rather a dialogue. We cannot talk about God but only to God. The dialogue is possible only if God has at first started it, in other words, if supra-

81 According to Spø, Religionsfilosofi, pp. 60-63, Heim’s ontological and theological terminology demonstrates that he tried to unify three fundamentally opposite views of God: those of Platonism and neo-Platonism, of personalism, and of Biblical faith. However, it is impossible to conclude from terminology alone what Heim tried to do. Heim strongly opposed Platonism in its all forms. They and all other forms of human thinking do not lead out of polarity, which is the transcendental horizon, according to Heim. See also van Inwangen, God, Knowledge, and Mystery, pp. 194-195. Heim preferred the word “Ur-Du” for God rather than “Du.”
polar space has opened upon us. According to Heim, the opening of the supra-polar space happens in the same way as the polar spaces open upon us: as a pure gift. In both cases, when the space opens, the logical law of bivalency is not adequate anymore. The only difference in the opening of spaces is that the opening of the polar spaces may widen our world-view, but the opening of the supra-polar space gives us a new comprehensive aspect toward entire reality. God, who is the center of supra-polar space, gets in touch with me—if He wills it at all—and meets with me in the Word through the Holy Spirit. More precisely, God talks to me as the incarnate Word or Jesus Christ, and Jesus Christ meets with me in the Holy Spirit in an analogous way as “I” and “Thou” meet each other in space in which they are in the relation of subordination. However, this meeting of “I” and “Thou” or I T is independent from both temporal and spatial distance. Heim agreed with Bultmann that the meeting between “I” and Christ cannot be an I I-relation, but he rejected Bultmann’s argument that it cannot be an I T-relation either.

When the supra-polar space of God opens upon us as a gift of God’s revelation, the absolute and seeing faith arises immediately: the supra-polar space has always been there, but I have lived in it blindly. In opinion of the atheist, this kind of belief requires a sacrifice of the intellect. The atheist believes so, because he/she is like the “flatlander” who thinks that to talk about the three-dimensional space is meaningless, although he/she lives in it every moment. Heim argued based on Fichte’s metaphor that the opening of spaces corresponds to the psychological development of mankind. There was at first only the objectifiable it-world in which we lived. Then we realized that there was also non-objectifiable reality, which prevails in “I” and “Thou.” The third phase of this development is “thinking in spaces,” which makes possible Heim’s revolutionary new world-view.

### B. Other Supra-polar Spaces

Supra-polar reality is wholly God’s space, because God is “all in all.” However, there exist other beings who possess features of the supra-polar space. Heim also argued

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83 “Ist aber Christus gegenüber nicht nur die Du-Beziehung unmöglich, sondern auch das Es-Verhältnis ausgeschaltet, so kann unser Glaubengehorsam ihn selbst überhaupt nicht mehr zum Inhalt haben.” JH, p. 180.
that such opposing world-views as “secularism” and “belief in God” are somehow supra-polar. This means that supra-polar space is a battleground of opposite wills and beliefs. Supra-polar space is wholly God’s space, but it is also at the same time the space of satanic power. In addition, the mathematical entity “number” also has supra-polar character, because it is eternally the same and an independent entity in every point of every world. Heim did not speak of supra-polarity of mathematics, but he argued, for example, that arithmetic has absolutely proved indeterminacy in QM. It is possible only if arithmetic is supra-polar, that is, absolutely independent tool. 84

Belief in satanic power is inseparable from the biblical world-view. Heim argued about it inflexibly and from the perspective of Jesus. 85 Satan cannot be an impersonal power but the personal will, which has risen in revolt against God. It is not any limited human will, but it is a pure, absolute hatred of God. It knows who God is and what God wills. Satan cannot be only a polar will but also a supra-polar will that is omnipresent in all polar spaces. Therefore, it is not only the will that affects me but is in me. In other words, the satanic will is not some strange will to me, but it has become my will.

If absolute satanic power belongs to supra-polar space, it means two irresolvable antinomies, because there are two opposite propositions both of which are necessarily true: the antinomy of omnipresence and the antinomy of omnipotence. Supra-polar God is omnipresent. There is also an omnipresent and supra-polar Satan. Because God is “all in all,” he must also be in Satan. Satan is God’s Satan (Gottes Teufel), as Luther argued. As for the antinomy of omnipotence: God and Satan are omnipotent and absolutely opposite supra-polar powers that cannot be reconciled. Heim argued that these two antinomies prevail at the same time. 86

Heim noted that these antinomies are not constructed by theologians, but they arise from a biblical basis and the experience of faith. Both the monistic picture of the

84 JH, pp. 87-102, and WnW, pp. 128-135. According to Schulte, Vom Weltbilde Karl Heims, pp. 17, 20, “will” and “belief”, even “I” and “T,” are supra-polar. Hans Schwarz, “Christus oder die Verzweiflung? Über das Lebenswerk Karl Heims,” in Evangelium und Wissenschaft, 36 (1999), pp. 4-13, argued that, according to Heim, only God’s space is supra-polar.
86 JH, pp. 102-106. In fact, Heim’s thought was similar to Luther. See Paul Althaus, Die Theologie Martin Luthers (Gütersloh: Verlagshaus Gerd Mohn, 1963), pp. 144-150.
omnipotent God and the dualistic picture of the fight between the two supra-polar powers belong inseparably together “in belief.” However, “in knowing” there is no synthesis between them. In fact, these antinomies are antinomies of the polarity and supra-polarity. There is the polarity between God and Satan, which is impossible, because they are supra-polar. Heim did not try to resolve this contradictory in any way. It is God’s task in the end of time, his own theodicy. Now we can only take all from God’s hands, from the left or from the right hand, as Luther said. It is our destiny until the end of time. 87

According to Heim, both polar and supra-polar realities are also the battlegrounds of the cosmic wills. God’s will is a universal and supra-polar goodness, which can be present in every polar space simultaneously. In the w-space, it is creatio continua through nature and W-space. However, Satan’s universal, supra-polar, evil, and an absolutely opposite will is also present in every polar space simultaneously. 88

The law of double polarity does not belong to supra-polarity. However, Heim used it to describe the battle between wills in reality. The battle between opposite wills is that of two opposite energetic powers, from which one must be stronger, and the other must be weaker. Without the energetic tension between these wills, there is neither power nor event in reality. This tension is the shaking of the original equilibrium. 89

Heim’s assertion that there is no power without the opposite power, is true in polar reality, but is it true also in the supra-polar reality? Heim answered that there are the God’s omnipotent will and Satan’s omnipotent will in supra-polar space. There are two opposite world-views that form a unity: God only is the omnipotent power, and yet there

87 It is almost impossible to find even the words “Satan” or “evil” in contemporary theological books. For example, Arthur Peacocke, Theology for a Scientific Age. Being and Becoming-Natural, Divine, and Human (Minneapolis, MN: Fortress Press, 1993), p. 127 and note 72, mentioned only in one note of his 438 pages “‘natural’ evils,” but not anything about “personal evil.” John Polkinghorne, The Faith of a Physicist (Minneapolis, MN: Fortress Press, 1996), pp. 36, and 82-85 and Science and Theology (Minneapolis, MN: Fortress Press, 1998), pp. 93-95, is more interested in “evil” than Peacocke. The problems of theodicy, of physical evil and moral evil, are the most perplexing of all difficulties that confront the religious believer. Polkinghorne’s solution is that God allows the whole universe to be itself. The cross of Christ is our guide, that God is no determinist. He is Providence.

88 JH, pp. 94-115. See also Verena Grüter, Begegnung mit dem göttlichen Du, pp. 123-137.

are two omnipotent powers, God and Satan. The original equilibrium was God alone in His nunc aeternum.

The willing “I” and “T” participate in the cosmic battle in supra-polar space. This participation is not a possibility but necessity. This means that the unity of seen and unseen world created by God is in God, and participates in his will. If God is God, He must “be all in all,” “act all in all,” and “all is from Him, through Him and to Him.” The inverse side of panentheism in Heim’s thought is the participation of the creatures in God. This means that there is only one reality or “hyperspace” in which there are polar or supra-polar relations between part-spaces and their contents. Through participation, God’s will becomes immanent, and our wills become transcendent. So God is, in Heim’s thinking, at the same time transcendent and immanent.90

Both polar and supra-polar spaces are also battlegrounds of two opposing beliefs. Heim strongly rejected the belief of German idealism, according to which, the knowing of God’s essence and will is a part of our self-consciousness. We need only to dive into the depth of ourselves to be in God. This conception cannot be true because then there were no unbelieving in God, no godlessness, and no atheism. According to Heim, the supra-polar God does not live in us. We are infinitely far from God (Gottesferne). Therefore, our lives are full of sufferings, and we are mortal. Death is the total destruction. Not only my body (i-space) is mortal but also my mind (I-space). Our lives without God or belief in Him are not our destiny but our guilt. Jesus Christ did not battle against destiny but against the satanic will and unbelief, both of which have a supra-polar quality.91

In the battle among wills and world-views, we do not ask, “How could I find a merciful God?” not even “Does God exist?” or “Is the world only a pure coincidence?” Heim argued that the situation is much more radical: in our days of nihilistic secularism, it is not meaningful to talk about God at all. Wittgenstein stated that about which we cannot talk we must keep silent. We are no longer God-fearing but godless. Our

90 JH, pp. 31–46. “Alles, was in Gott ist, muß teilhaben an seinem Wesen. Denn gäbe es ein anderes, nichtgöttliches Sein, das außerhalb des göttlichen Seins stände, so wäre dieses ein Gegenpol zum göttlichen Sein.”
91 JH, pp. 73–86.
godlessness (Gottlosigkeit) is not an exception, or a mistake, but a supra-polar will to power, as Nietzsche argued: If God exists, how could I tolerate that I am not God?

Every theoretical or practical action implies trust (Vertrauen) on that which our world-view is based. The trust is also intentionally directed to some object, and is dependent upon it. This object is “our God,” a concrete or an abstract idol (Abgott). Our destiny is the attempt to find a base upon which the questions “Why does anything exist?” and “From where do our ethical actions receive their legitimacy?” could get a trustworthy answer. However, we cannot find any reliable answer from polar reality. We have two possibilities. Either we trust our own idol(s) or we believe in God. Because God’s space, according to Heim, is the supra-polar reality, not our knowledge, or our thinking, nor our believing can reach God. There is no human way from the polarity to God’s supra-polarity. God is transcendent for us. Only if God’s supra-polar space opens upon us, can our eyes open, and we will realize that we have always been living in His hands. God has answered our ultimate questions by both general revelation and especially by the special revelation of the incarnate God, Jesus Christ, who alone must be our Lord. Therefore, it is impossible actively to believe in God but only passively as a gift. This understanding of belief in God as a passive gift is the influence of the Holy Spirit, and as such a testimony of the Holy Spirit. Like the will, belief has in this limited meaning a supra-polar quality, in which the I-space can participate, because God’s supra-polar reality with His gift is omnipresent in nunc aeternum, which is W-space. According to German absolute idealism, God has lived in us since we were born, but according to Heim, we have been living in God since we were born.92

92 JH, pp. 8-46
3. A Formal Presentation of Heim’s Dimensional Thinking

The first endeavor of this dissertation was the critical analysis of the basic concepts and the intension of Heim’s dimensional doctrine. I will now try to formalize it, because the discussion would be easier with a meta-language. The formalization is trivial, but in it, there is a possible explanation of the concepts and the intension of Heim’s dimensional thinking. In the first-order predicate logic, a formalized appearance of Heim’s dimensional doctrine is the following: 93

Space (S):

Every limitless (L) and infinite (F) continuum (C) is space.

\[ S = \text{Def.} (x) (Lx \ & \ Fx \ & \ Cx) \]

in which L and F are relevant and relational.

Space types:

S (1) Physical
S (2) Mathematical
S (3) Conscious (self or mind)
S (4) Panpsychic

Dimensions of spaces: 0 → ∞

Contents of spaces: \( s_1, s_2, s_3, s_4 \ldots s_n \)

Boundary (B):

Boundary of Content: \( Bc = / \), for example, \( s_1 / s_2 \)

Boundary of Dimension: \( Bd = / \), for example, \( S_1 / S_2 \), in which \( / = c^{-1} \) (velocity of light)

(1) Content and Space: \( s \subset S = \text{Def.} (x) (x \in s \rightarrow x \in S) \)

(2) Unity of Contents: \( s_1 = s_2 = \text{Df.} (\exists x) (x \in s_1 \ & \ x \in s_2) \), in which \( x = B \)

Difference of Contents: \( s_1 \neq s_2 = \text{Df.} (\exists x) (x \in s_1 \ \lor \ x \in s_2) \)

Unity of Dimensions: \( S_1 = S_2 = \text{Df.} (x) (x \in S_1 \ & \ x \in S_2) \), in which \( x = s \)

Difference of Dimensions: \( S_1 \neq S_2 = \text{Df.} (x) (x \in S_1 \ \lor \ x \in S_2) \)

(3) Part-relation of Contents: \( s_1 \subset s_2 = \text{Df.} (x) (x \in s_1 \rightarrow x \in s_2) \)

Part-relation of Dimensions: \( S_1 \subset S_2 = \text{Df.} (x) (x \in S_1 \rightarrow x \in S_2) \), in which \( x = s \)

(4) Contact of Contents: \( s_1 \mid s_2 = \text{Df.} (\exists x) (x \in s_1 \ & \ x \in s_2) \), in which \( x = Bc \)

Meeting of Dimensions: \( S_1 \mid S_2 = \text{Df.} (\exists x) (x \in S_1 \ & \ x \in S_2) \), in which \( x = s \)

(5) Knowledge of Contents: \( S \vdash s \) − Df. \((x = a\ posteriori)\)

Knowledge of Dimensions: \( S \vdash S_2 \) = Df. \((x = synthetic\ a\ priori)\)

Polarity (P):

Intra-mundane polarity: \( Pp = Df. (x) (y) (z) ((x \leftrightarrow y) \leftrightarrow z) \), in which \( x = S, y = s, z = \) indifference pole. Polarity is the absolute simultaneity between \( x, y, \) and \( z. \)

Supra-polarity: \( Ps = Df. \sim Pp \)

Spaces (S):

\( S(1): i, t, \) and \( w \)
\( S(3): I, T, \) and \( W \)
\( S(4): T \) and \( t \)

Boundary (B):

\( Bd: i \div t, I \div i \equiv T \div t, \) and \( I \div T \)

\( i = t: Df. (s) (s \in i \& s \in t) \)
\( i \neq t: Df. (s) (s \in i \lor s \in t) \)

\( I = i: Df. (s) (s \in I \& s \in i) \)
\( I \neq i: Df. (s) (s \in I \lor s \in i) \)

\( I = T: Df. (s) (s \in I \& s \in T) \)
\( I \neq T: Df. (s) (s \in I \lor s \in T) \)

\( (i \& t) \subset w: Df. (s) (s \in (i \lor t) \rightarrow s \in w) \)
\( (I \& i) \subset i: Df. (s) (s \in (I \lor i) \rightarrow s \in i) \)
\( (I \& T) \subset W: Df. (s) (s \in (I \lor T) \rightarrow s \in W) \)

\( i \div t: Df. (\exists s) (s \in i \& s \in t) \)
\( I \div i: Df. (I) (I = I) \& I \in i) \)
\( I \div T: Df. (\exists s) (s \in I \& s \in T) \)

\( i \neq t: Df. \text{ Synthetic a priori } i \rightarrow t \)
\( I \neq i: Df. \text{ Synthetic a priori } i \rightarrow I \)
\( I \neq T: Df. \text{ Synthetic a priori } I \rightarrow T \)

Polarity (P):

\( Pp: Df. ((I \leftrightarrow T) \leftrightarrow W) \& ((I \leftrightarrow i) \leftrightarrow i) \& ((i \leftrightarrow t) \leftrightarrow w) \)

\( Ps: Df. \sim Pp = S \text{ God. } (S \text{ satan}) \lor (S \text{ will}) \lor (S \text{ belief}): \text{ supra-polar character } (\sim Pp) \)
The intension of the dimensional thinking could be illustrated as the following diagram (Figure 3):⁹⁴

![Diagram of dimensional thinking]

All Pp-spaces are limitless and infinite.  
Ps is present in all points of all spaces.  
= Polarity  
= Omnipresence  
= Non-objectifiable

Reality according to the Heim’s concepts space (S), boundary (B), and polarity (P), and the intension of his dimensional doctrine, is monistic, and there are three levels of relations: transcendent, non-objectifiable, and objectifiable. Dimensional boundaries and polarity prevail between the intramundane spaces in the supra-polar hyperspace. Corresponding to reality, Heim’s world-view is panentheistic. It is also dynamic, because of the polarity between the objectifiable and non-objectifiable spaces. Namely, reality is not experienced only as a static state but also as dynamic action.

The issue of how it is possible to “communicate dimensionally” is the subject of the next chapter. In other words, what is the extension of Heim’s dimensional thinking? How did Heim apply his dimensional thinking? The purpose of Heim’s dimensional thinking was to give the unambiguous conceptual and ontological foundation for thinking and believing in God’s revelation and action in scientific context. Does this mean that

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⁹⁴ There is an illustration in the dissertation of Ingemar Holmstrand, *Karl Heim on Philosophy, Science and the Transcendence of God*, p. 17. However, it is insufficient, because, for example, it does not include Ps.
Heim has only constructed a basis on which other thinkers can, if they wish, build their own interpretations of reality?

I argue that Heim’s dimensional thinking is not only the conceptual foundation for believing in and thinking of God’s revelation and action. It has not only theological contributions but also philosophical and scientific ones. Therefore, in the next chapter, concerning the extension of Heim’s dimensional thinking, we will systematically analyze its contributions to philosophy, science, and theology.
EXTENSION OF HEIM’S DIMENSIONAL THINKING

The extension of a concept usually means the class of existing entities to which the concept is applicable. In this chapter, we use the concept of “extension” in a large meaning. We ask, what are the contributions of Heim’s dimensional thinking to philosophy, science, and theology.

1. Contributions to Philosophy

The point of departure in Heim’s dimensional thinking was ontological rather than epistemological to provide an unambiguous conceptual foundation consonant with philosophy, science, and theology. According to Heim, this ontological endeavor was to expand Kant’s epistemological forms of intuition. Heim claimed that Kant’s epistemological scheme can only map sensations, and thus are not able to map an ontological side of objective reality, which is independent from our sensations and the ability of the mind to construct it.¹ Heim also tried to build a new ontological and dynamic world-view that brings together seemingly incompatible methods of analysis and phenomenology.² Therefore, I will first analyze the contribution of Heim’s dimensional thinking to Kant’s critical idealism. The second contribution was a logical consequence of Heim’s dimensional thinking to the controversy between idealism and realism. According to Heim, after Einstein’s SR and GR, it is no longer possible to assume a position either of idealism or of realism because both belong inseparably together.³ Heim claimed that it is possible to combine idealism and realism. Heim’s

¹ GD, pp. 31,34.
² GD, pp. 29-30.
³ See Heim, “Gedanken eines Theologen zu Einsteins Relativitätstheorie,” in GL, pp. 125-143. Einstein took the position of critical physical realism, and rejected all kind of idealism, as we have seen in Chapter I. Heim stated that his dimensional doctrine is independent of any epistemological stance about reality, because it was an ontological doctrine. GD, pp. 49-51.
endeavor was to break down epistemological boundaries within the ontological unity of reality. However, the synthesis of realism and idealism is possible only if it is based on the concept of two-dimensional time. On the idea of the concept of one-dimensional physical time, it is possible to take either the position of idealism or realism. The third contribution belongs to the above-mentioned problems, which are fundamentally “subject-object” problems. Namely, Heim’s dimensional thinking also provides a serious solution to the problem of “mind-body.”

A. Kant’s critical idealism

Heim’s dimensional thinking was mainly a debate with Kant. In order to understand the contribution of Heim’s dimensional thinking for Kant’s critical idealism, we must at first analyze some criticisms about the flaws of Kant’s thinking. Then it will be possible to point to a new treatment of Heim’s dimensional thinking for Kant’s critical idealism.

Almost every significant philosophical thought since 1800 has been a response to Kant and, especially, his understanding of a priori knowledge. Kant’s “Copernican Revolution” presented a theory of experience and a non-Platonist account of the a priori. It was an argument for universal categories, but the price was the technical restriction of the categories to the “inside” of the mind: to one’s experience and to the perceiving activities of the mind. Kant identified two sources of a priori: the mind has a receptive capacity, or sensibility, which was necessarily a spatio-temporal character of sensation, and the mind possesses a conceptual capacity, or understanding that applies concepts to sensory experience.

Kant’s fundamental question was: “How are such synthetic a priori judgments possible?” His intention was to achieve a certainty for metaphysics. Therefore, he wanted to show that philosophers and natural scientists were not able, and would never be able, to give final answers to the questions about the nature of the physical world, the human mind, and about the existence and attributes of God, because of the insurmountable transcendental horizon of our understanding. The actual consequence of Kant’s endeavor was a radical agnosticism and a ghostly status for the thing-in-itself,
although the existence of objects was systematically maintained to avoid subjective idealism and solipsism. Kant, however, could not develop adequate justification for the universality and necessity of the individual categories of space, time, substance, and causality. For example, the notion of universal causal order is dependent on physical time, not on intuition of time.4

Kant was not quite bold enough to step onto the new intellectual ground he had liberated. He still found the idea that we could know thing-in-themselves problematic. Even as he attacked the “myth of the given” found in empiricism and the “blindness” of non-conceptualized experience, he clung to the empiricist notion of “impressions,” which are given in atomistic bits and then synthesized to give us objects. Moreover, as he argued for the active roles of understanding and imagination in perception, Kant retained the quite conservative belief that there is but one set of categories and consequently one possible conception of the world. He did not think far enough ahead of his idea to realize that if we supply the categories by which objects are synthesized, then we might also supply other categories. Kant’s system was built, in fact, on a semantic swamp, and it took most of the nineteenth century before these confusions were recognized and neutralized. Post-Kantian philosophy could be characterized most simply as the decline and fall of pure intuition.5

Neo-Kantianism is the label for a variety of movements in post-Kantian epistemological thought, which believed that what Kant meant (even without saying it clearly) was profound and true. The Kantian absolutists accepted Kant’s factual claims in their original forms. The Neo-Kantian absolutists accepted Kant's claim of uniqueness, but replaced his synthetic a priori judgments and categories with a different one. The Neo-Kantian pluralists rejected his claims of uniqueness and, hence, of completeness. Einstein’s critical physical realism could also belong to this epistemological line of post-Kantian philosophies.6

4 Morrison, Einstein, Kant and Tillich, pp. 108-111.
6 Ibid., p. 57, and Körner, “Introduction,” in Ernst Cassirer, Kant’s Life and Thought, p. x.
There was a sharp disagreement over the correctness of Kant’s factual claims, even among philosophers who accepted his distinctions between synthetic a posteriori and synthetic a priori judgments, and between a posteriori and a priori concepts. The main reason for these disagreements was developments in mathematics and physics. Non-Euclidean geometry, Einstein’s SR and GR, and QM were incompatible, or at least difficult to combine, with the Kantian system. For example, the Kant’s a priori principle of causality and continuity are dubious in a quantum mechanical frame.\(^7\)

Kant’s transcendental justification of his factual claims, especially transcendental deduction of his categories has been the subject of the radical and irreconcilable criticism. For instance, Neo-Kantian pluralists deny the possibility of universally and necessarily true synthetic a priori judgments. They hold that since the quaesitio facti has to be answered in the negative and since Kant’s factual claim has to be rejected, the quaesitio iuris does not arise. On the other hand, many analytical philosophers with Kantian sympathies argue that a logical inference can be validly reconstructed if the Kantian set of categories is replaced by another set. However, C.D. Broad claimed that Kant’s invalid logical inference could be replaced by a more modest probabilistic argument. Kantian absolutists accepted Kant’s factual claims, but argued that his transcendental deduction is an instance of the irremediably invalid logical fallacy of circular reasoning. Kant’s correct factual claims can only be justified by showing that his categories are applicable to an originally obscure and non-propositional cognition, as, for example, in arithmetic and geometry, where a priori concepts are applicable to the non-propositional intuitions of time and space.\(^8\)

Heim’s dimensional thinking provides remarkable contributions to Kant’s question, “How are synthetic a priori judgments possible?” to Kant’s conceptions of space and time, and to Kant’s transcendental horizon between phenomena and noumena.\(^9\)

As was discussed in Chapter I, Kant debated with the epistemological problems generated by empiricism and rationalism. He tried to prove how are synthetic a priori judgments possible. He argued that there are synthetic judgments a priori, and that there

\(^7\) Ibid., pp. ix-x.
\(^8\) Körner, “Introduction,” p. xi.
\(^9\) The contributions are indirect logical conclusions from Heim’s dimensional doctrine. Regrettably, Heim himself did not directly make any conclusions from his dimensional doctrine.
is one and only one internally consistent set of them in his Critique of Pure Reason. For Heim, epistemological questions were consequences of ontological questions, and therefore, he bracketed epistemological questions. He did not ask how the immaterial mind could conform itself to material objects in the world, as empiricists and rationalists did, or how the world could conform itself to the mind, as Kant did. Heim did not claim, as Kant had, that it is the mind itself that gives objects at least some of their characteristics, because they must conform to the mind’s structure and conceptual capacities. Instead, he asked, what kind of ontological relations prevail between the mind and object?¹⁰

In the polar world of “I-Thou-It,” there are only infinite and limitless spaces, which are dimensionally and polarly related to each other. Heim agreed with Kant that the world is rational and knowable, not a priori through an active analysis of ideas and derivations done through logic, as Leibniz thought, but a posteriori and synthetically a priori, when the spaces open upon us. Kant thought that there are synthetic a priori judgments that are actively constructed by pure reason. He claimed, “What we can know a priori about objects is limited to that which we ourselves put into those objects.”¹¹ Heim rejected Kant’s claim and argued that the mind is passive in the process of dimensional knowing. For Heim the opening of spaces was a synthetic a priori and non-propositional event that occurred in two-dimensional time-space. When an unknown space opens upon us, we can immediately know its structure and its principles of order. From the “old” space into a “new” space, it is possible to cross analogically in the same way as we can cross from a Euclidean space into a non-Euclidean space.

There is a limit between subject and object, which cannot be neglected, as Kant had tried to show. However, Kant’s transcendental horizon was only the limit of contents within space and time. Instead, Heim’s boundary was the dimensional horizon between two spaces. The consequence of this horizon is that we cannot put anything into objects. Kant argued that the objects are not simply given in experience but rather constituted or synthesized as a necessary condition for experience by pure concepts of the understanding. The synthetic a priori claims were true for him because of the structure

¹⁰ GD, pp. 30-31.
¹¹ Kant, B xvii, (III 19).
of the mind that knows them. For Heim, the synthetic a priori events were true, because they occurred in a physical time-dimension, which is independent of mind, and at the same time, in the eternal time-dimension, where “I” exist and know them dimensionally. Thus, the crucial difference between Kant and Heim was that Kant’s thought was directed into contents of a space and Heim’s thought into spaces. Kant made epistemological and propositional claims about contents of objects within a space and a time of pure reason, whereas Heim made non-propositional and ontological conclusions about dimensional events between spaces “I” and “i,” that is, between the epistemological subject and its objects. 12

Kant’s understanding of self as pure reason that is also an unknown entity was quite similar to Heim’s thought. However, Kant failed to answer his own question, how can subjective conditions of thought have objective validity?, because of his incorrect conception of space-time. Kant had rejected Leibniz’s principle of relativity of space and time and accepted Newton’s concepts of absolute space and absolute time. He put them as pure “forms” inside the mind. Space and time were only “sensitive” concepts, whose applicability was restricted only to sensations or to phenomena, not to objective reality except as a means of accessing objects by one’s understanding. Kantian space was the formal a priori condition of outer experiences, and time was the formal a priori condition of appearances without any physical status. Thus, Kantian conception leads to solipsism, even if the conditions of knowledge are the same to all knowing subjects, because there is no space and time without at least one subjective observer. Heim rejected Kant’s conception and argued that space-time has both physical and phenomenal status. Time must be the physical and experienced two-dimensional space. 13

Kant divided the realm of knowledge into two separated domains, that of phenomena and that of noumena. He claimed, as an empirical realist, that we only have empirical knowledge about phenomena based on a posteriori experience of the world through the senses and, as a transcendental idealist, that these phenomena were constructed by the a priori or “given” structure of the mind. Knowledge was a product of

12 GD, pp. 71-75. Heim sometimes used the concept “dimensional horizon” against that of “dimensional boundary.”
13 GD, p. 34.
interaction of the senses and the ordering structure of minds. Kant claimed that objects belong into the realm of noumena, where there are no categories. Metaphysically there is an external world beyond our private experiences, but epistemologically there is a transcendental horizon between the phenomenal realm of sensibility and the noumenal realm of things-in-themselves, the universe as a causal whole, the human self, and God. Heim agreed with Kant that there is the external world, “i,” but it is not beyond “I.” “I” is the perspectival and non-objectifiable center of “i.” However, there is a limit or boundary between them. Heim rejected Kant’s belief that it is impossible to overcome this boundary and know anything about noumena.14 Because Kant thought contents of space, his transcendental horizon between phenomena and noumena was like a Plato’s wall on which we can see shadows from transcendence, but cannot see beyond that wall. According to Heim’s dimensional thinking, there is no wall or the boundary of content but rather the dimensional boundary between two spaces, I/i. Moreover, the boundary can be overcome by the dimensional knowing way, I$i$. This knowing way is synthetic a priori, when “i” opens upon “I.”15 In addition, because of the dimensional part-relations ((I&i) ⊂ i and (i&t) ⊂ w “I” is the perspectival center of “i,” “T” is the perspectival center of “t,” and they both are simultaneously perspectival centers of w-reality, it is possible to know dimensionally, intersubjectively, and continuously more and more, not only about “things-in-themselves,” but also about the universe as a finite and causal whole. As an epistemological subject, “I” can know dimensionally something about my objects, “i,” and also about in itself the non-objectifiable “T,” if those open upon my consciousness-space “i.”16 God as a genuine transcendence, instead, is the supra-polar space, and could not be reached by any kind of theoretical or practical polar knowledge. Heim agreed with Kant that it is possible to believe in and think about God, but it is impossible to prove God’s existence by any ontological or teleological method. Kant proved it epistemologically and Heim ontologically. Heim argued that there is no way from polar reality into supra-polar reality.

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14 GD, p. 50.
15 GD, p. 74.
16 GD, pp. 66-69.
Kant’s categorical imperative was not universal either, because anyone can always change his or her subjective imperative, and because, as an ultimate justification of human behavior the categorical imperative does not lead out of polarity of the world. On the other hand, according to Heim’s panentheism, because supra-polar space is present in every polar space, it is possible to know passively—as a gift from God—something about God and His will. The God’s will is the only justification for our action. It could happen in the dimensional meeting $S \text{ God } \mid I$, which is a synthetic a priori event analogous to the opening of new polar spaces. Everything could be transparent between polar and supra-polar spaces. Strictly speaking, there was only one “noumenal entity” for Heim, namely, the non-objectifiable “I,” that is, the epistemological subject.¹⁷

According to Heim’s dimensional thinking, there is not only an epistemological transcendental horizon between phenomena and noumena but also an ontological and dimensional boundary that prevails between all kinds of spaces, both objectifiable and non-objectifiable. This ontological boundary has epistemological consequences. Kant artificially separated phenomena and noumena, and tried, in fact, to cross his own shadow.¹⁸ Heim argued ontologically that reality is a polar unity with objectifiable and non-objectifiable realms. In the same way knowledge and faith, theory and practice, facts and values, cannot be separated because of two-dimensional time, $P_p = ((I \leftrightarrow T) \leftrightarrow W) \& ((I \leftrightarrow i) \leftrightarrow i) \& ((i \leftrightarrow t) \leftrightarrow w)$. Kant’s epistemological separation of reality into the realms of phenomena and noumena was, in fact, Platonic and dualistic, and it was based on his incorrect conception of space-time that space and time are only forms inside the mind and do not inhere in things-in-themselves. Heim argued instead, that reality is a monistic unity, and that there are only dimensional relations between non-objectifiable subjects and their objects, both of which exist in the same polar reality. He bracketed all epistemological questions of empiricism and rationalism, and provided an impressive ontological answer to them: the given structure of our world (not only of our minds) is polar and dimensional within two-dimensional time.

Thus, the most crucial difference between Kant and Heim was a fundamentally different concept of time. In Kant’s critical idealism, time was only a form of the mind,

¹⁷ GD, pp. 195-196, and GN, p. 231.
¹⁸ GD, p. 50.
whereas in Heim’s dimensional thinking it was a two-dimensional space. Since Heim published his work, all kinds of solutions based on a classical conception of time, are misleading within the domains of epistemology and ontology. Time is no longer a content of space.\textsuperscript{19}

B. The Controversy between Idealism and Realism

I have argued that an important contribution of Heim’s dimensional thinking for philosophy was the elimination of the controversy between the two philosophical world-views of idealism and of realism. Heim had already emphasized in his book, Das Weltbild der Zukunft (1904), that it is possible to eliminate all contradictions between subject and object, perception and existence, as we have seen in Chapter I. This goal was realized in his dimensional thinking, whose direct effect was the synthesis of idealism and realism. Heim’s point of departure was the battle between metaphysical monism and dualism, and he rejected their demands to be absolute. On the one hand, he argued that what appears to be “dualism” might only be the difference between the polar reality and supra-polar reality. His panentheism presupposes that reality is wholeness, “hyperspace,” and not any dualistic “two-story house.”\textsuperscript{20}

Heim proved that, like Kant’s critical idealism, the German idealism of Fichte, Schelling, and Hegel, the existentialism of Heidegger, the critical realism of Einstein, and the quantum idealism of Heisenberg were also one-sided, being either idealistic or realistic, and as such insufficient descriptions of reality. Only Schelling’s “ideal-realism” was a quite similar endeavor to Heim, namelly, to unify idealism and realism. Because Heim’s dimensional thinking combined ontologically both objectifiable and non-objectifiable reality, that is, the physical and eternal dimension of time, it was possible to avoid epistemological controversy and oscillation between idealism and realism.

Heim agreed with Fichte’s “ontology of knowledge” that subject and object, presentation and thing, belong inseparably together, and that “I” (“I am”) is the center of reality. Like Fichte, Heim also claimed that a balance between the roles of subject and

\textsuperscript{19} GD. pp. 30-34, 46-51.
\textsuperscript{20} GD. pp. 15-34.
object could be maintained. Nevertheless, he rejected the abstract principle of subjectivity, the “I-myth,” of Fichte’s thinking. The objective world “it” in the totality of its being and its operation cannot be any process of emergence from one’s self-consciousness and its imaginative activities, or that the world could be constructed from the self’s fundamental freedom, because, according to Heim, both the knower and the known are “given,” and they exist in the same polar reality. Objects do not exist only as objects in the mind or in the consciousness of “I.” Fichte believed that the noumenal self expands infinitely to comprehend everything and do everything. Heim rejected these speculations by emphasizing that there is a dimensional boundary between subject and object, I/i, which cannot be eliminated. I am in the world, but I cannot construct the world by putting something in it or make myself identical to the whole world, because of the dimensional boundary and the polarity between spaces “I” and “i.” Even the absolute, invariable, and eternal ego in its different modes of German speculative idealism is not free from the polarity, either. W-space in Heim’s dimensional thinking is a parallel concept with an absolute ego, but its existence is polar, because it is the eternal condition of indifference of polar time-space, and dimensional inclusion (I&T) ⊂ W prevails between “I” and “T.” W-reality (Werden) means “to be becoming,” but neither “I” nor “T” can become “i” or “t,” and W-reality cannot become w-reality (Geworden), “to be come,” because time is two-dimensional. The temporal or objectifiable dimension and the eternal or non-objectifiable dimension of time-space are in dimensional and polar relation with each other. It follows that the quality of eternality (W) cannot change, evaporate, or emanate into temporality (w), and vice versa. Although time would be only the classical and absolute one-dimensional space, as was believed in German idealism, the speculations about making itself into both subject and object at the same time are not possible, because of the universal law of non-contradiction: I cannot be both this and that or here and there simultaneously.

Schelling believed that it was possible to prove the identity of transcendental idealism and critical realism. He made parallel realism and idealism with the help of his concept of polarity between the conscious and empirical ego and the unconscious and

absolute ego within it. However, he, ignoring his own concept of the polarity, argued that the free ego makes itself to be both subject and object. Heim rejected this speculation as impossible. Schelling based the synthesis of realism and idealism on his conception of self-consciousness as a steady, enduring juxtaposition of conscious and unconscious activities, and as an ongoing translation from unconscious to conscious activity of the primordial will. Heim agreed with Schelling’s ideas in part, but he rejected its “I-myth” and conception of time. There are only two kinds of knowing and willing egos, “I” and “T,” which are non-objectifiable, but not empirical and non-empirical simultaneously. “I”-space, “T”-space, and “W”-space are the perspectival, non-objectifiable, and eternal centers of the temporal “i”-space, “t”-space, and “w”-space. Non-objectifiable spaces cannot change into objectifiable spaces, and vice versa, because of polarity and two-dimensional time.  

Like Hegel’s, Heim’s purpose was to clarify Kant’s transcendental idealism from its epistemological solipsism. Kant had recognized the importance of the differences between the transcendental ego and the empirical self or person and the metaphysical notion of the soul, but he was not able to resolve their ontological relationship. Hegel’s conception of “universal subject” was similar to Heim’s conception of “We-space,” but its relationship to objects, “we-space,” was false because Hegel’s Geist was floating above physical time. Hegel argued that our activities are as essential to the object of knowledge as the object is to our knowledge. He believed that we are responsible for producing the objects that we are apparently given. Heim rejected this speculation as impossible. I-, T-, or We-spaces cannot produce or create i-, t-, or we-spaces, whose perspectival centers they are. Moreover, there are dimensional boundaries between spaces, whose opening occurs passively as an event of synthetic a priori, and polarity, which absolutely relates subject and its object inseparably and simultaneously together. Heim’s dimensional “unity and difference” and Hegel’s “unity in difference,” for example, were similar, but Hegel’s absolute idealism ignored the role of time as their unifying foundation. In his epistemology and ontology, the concept of time was for Hegel as illusory as in Kant’s transcendental idealism.  

22 GN, pp. 146-154.  
23 GD, pp.98-139, 162-168.
Thus, the synthesis of idealism and realism is not an identity but the polar relation within the two-dimensional time. Idealism and realism belong together as a time-relation.

Like Heidegger, as was discussed in Chapter I, Heim argued that phenomenology and ontology, phenomena and things-in-themselves, belong inseparably together but they are not identical. Like Heidegger, Heim also argued against Husserl that it is impossible to “bracket” existence, because our existence is essentially “being-in-the-world.” Both human existence and the existence of the world around us are “given” as the starting point of all phenomenological description. Like Heidegger, Heim emphasized that reality is not only ontic but also ontological. The ontological dimension is “inside” the ontic dimension of reality: \((I \& i) \subset i\). However, the ego is not any internal object that inhabits consciousness, as Heidegger believed. It is the non-objectifiable and perspectival center of consciousness. Ontic reality does not evolve from the ontological reality of “Dasein.”

In spite of some similar features of conceptions of time in Heim and Heidegger’s thought, their concepts of time were fundamentally opposing. Heidegger separated the ontic, measurable, relative, and “inauthentic” time from the ontological, immeasurable, personal, and “authentic” time, whereas Heim unified them. In addition, Heidegger’s ontic time runs forward, and his ontological time runs backward, whereas Heim’s two-dimensional time runs only forward. For Heidegger, the future as time was fundamental, whereas for Heim, the present as nunc aeternum within physical time was more fundamental than the future. Heidegger argued that “I am time, I have time, and I give time,” whereas Heim stated, “I am in time.” Heim’s statement is ontologically the only possible position, because “I am” represents the eternal dimension of time, and “in time” its temporal dimension. Heidegger’s existentialism could not be the basis for unifying idealism and realism, because his existential monism leads to ontological idealism and epistemological solipsism, where the spatial and temporal relations between subject and object evaporate in phenomenological immediacy, and existential subjectivity is prior to external objectivity. The synthesis between idealism and realism is possible only based on Heim’s concept of time, which unifies and separates the ontic and ontological dimensions of time.
As we have seen above in Chapter I, Einstein tried to reject phenomenalism by accepting the position of critical realism. Yet, his SR was a theory of relations between phenomenalistic events, rather than a theory of a real world behind sensations. Heim’s dimensional thinking was largely based on Einstein’s SR, but as an ontological theory it pertains to both phenomenalistic events and the physically real world behind such phenomena. Einstein shifted into this position of realism after he had rejected Ernst Mach’s positivism and accepted Max Planck’s critical realism. Thus, both Heim and Einstein could avoid solipsism and subjectivism.

Einstein, as a critical physical realist, argued that the space-time continuum unites space and time in a single, objective structure that exists independently of the structures that move within it. Moreover, Einstein regarded physical reality as being independent of the observer. Against Einstein, however, Heim argued that after SR and GR it is not possible to divide reality into two different realms and to accept either the position of idealism or realism, because they both belong inseparably together. Einstein had described the basic laws of nature or the objectifiable reality of “i,” “t,” and “w,” but he neglected to describe the non-objectifiable reality of the epistemological subjects, “I,” “T,” and “W.” Moreover, Einstein did not realize the most fundamental law of the world, namely, the law of polarity. His space-time continuum, w, was only the externally and objectively real four-dimensional universe. Heim’s dimensional doctrine and its dimensional inclusions, (i&t) ⊂ w, (I&i) ⊂ i and (I&T) ⊂ W, where the epistemological subjects “I” and “T” are the non-objectifiable center points of physical reality, show that Einstein’s theories were unfinished.24 Reality is not only a four-dimensional space-time but also a five-dimensional time-space continuum, where time has two dimensions, the objectifiable and temporal, and the non-objectifiable and eternal.

Einstein believed that if matter were to disappear, space-time alone would remain eternally as a stage or field for physical happenings. Instead, Heim argued that reality as polar entirety is an inseparable relational wholeness of all kinds of subjects and objects. Even if the human subjects were to disappear, “T”-space continuums of type (4) would

24 Einstein had confessed to Rudolf Carnap that “what is now, worries me seriously” and that “there is something essential about the now,” but expressed the belief that, whatever it was, it is “just outside the realm of science.” See The Philosophy of Rudolf Carnap, ed. P.A. Schilpp (La Salle, IL: Library of Living Philosophers, 1963), p. 37.
still remain as centers of physical and phenomenal happenings. SR and GR explain only the objectifiable side of reality, but they cannot explain its non-objectifiable side, as Einstein’s battle with Niels Bohr proved. SR and GR were revolutionary, but regrettably, Einstein could not find solution to the problems between his SR and QM, because his concept of time was only one-dimensional and, as such incomplete.

Werner Heisenberg’s, partly epistemological and mostly ontological, thinking and Heim’s dimensional thinking had some similar features. Both of them strongly rejected materialistic reductionism, which was an endeavor to neglect the quantum boundary. Heisenberg proved that it is impossible to overcome the quantum boundary between matter and energy. However, Heim rejected Heisenberg’s phenomenalistic belief that sub-atomic particles do not exist continuously between observations. For Heim, sub-atomic energy was a potential but really existing entity that, as non-objectifiable, belonged to the eternal dimension of time, W-reality. Yet, the effects of energy were objectifiable and measurable because those belonged to the physical dimension of time, W-reality. Subatomic particles existed continuously, but their discrete and statistical character in any situation of measurements was caused by the dimensional boundary between W- and G-realities.²⁵

Heisenberg argued that even though rigid and absolute causality is valid in macrophysics, it is invalid in microphysics because of his uncertainty principle. He rejected determinism in favor of Fichte’s notion of possibility and voluntarism. He believed that transcendental reality precedes physical reality, but that they are complementarily in an “either-or” relation. Heim argued that they are not only disjunctive but also simultaneously in a conjunctive relation of “both-and”, because of two-dimensional time, where possibility and necessity, indeterminism and determinism, are not complementary but “polar.” Heisenberg also believed that classical space and time somehow disappear at the quantum boundary and make room for the indeterministic probability functions of space-time, where these functions combine subjective and objective elements. According to Heim, it is impossible that space-time disappears in

²⁵ WnW, pp. 38-40, 130-133, 139-144.
observational situations. Reality is a five-dimensional W-w-space, where time has two-dimensions, and both dimensional boundary and polarity prevail between spaces.\textsuperscript{26}

Heisenberg believed that atoms constitute a discontinuous, indeterministic world, and therefore, subatomic reality must have a non-materialistic status, and the law of bivalence is not valid in ontology. Heim, instead, argued that, because the core of an electron is T-space of type (4), which means that it has some kind of unknowable will and so belongs to W-reality as a non-objectifiable center of w-reality, there is no discontinuity between W- and w-realities. When, for example, “i”-space open upon “I”-space synthetically a priori, the principle of bivalence is not valid, because “either-or” and “both-and,” necessity and possibility, are simultaneous.\textsuperscript{27}

The formal structure of Heim’s dimensional world-view is quite similar to Heisenberg’s three layers of reality: supra-polar reality, non-objectifiable polar reality, and objectifiable polar reality. However, Heim’s dimensional doctrine requires not only the position of idealism but also the position of realism. Idealism and realism belong inseparably together, because of two-dimensional time. In addition, his law of universal polarity necessarily implies the relation of idealism-realism, because this mental reality cannot be without that physical reality, and vice versa.

C. The Mind-body Problem

The mind-body or mind-brain problem has again become a respectable subject of investigation in contemporary philosophy, psychology, cognitive science, and neuroscience. It has been a battleground of the two opposing world-views, that of monism and that of dualism. Dualists think that there are two fundamentally different kinds of phenomena in the world, minds and bodies. Monists think that the world is made of only one kind of stuff, minds or bodies. Dualists divide into “substance dualists” who think that mind and body are two kinds of substances, and “property dualists” who think that the terms “mental” and “physical” name two kinds of properties

\textsuperscript{26} WNW, p. 53.
\textsuperscript{27} WNW, pp. 56-64.
or features in a way that enables the same substance to have both kinds of properties at once. Monists divide into “idealists” who think that everything is ultimately mental, and “materialists” who think that everything is ultimately physical or material.  

During the long history of Western thought no one has found the ultimate solution to this controversial problem. Biology and physiology have been able to explain some things about the most complex object known in the universe, the brain, but the mind is still unexplained. The issue is, can the mind be fully explained by the brain, or are they separate entities? Moreover, what are the cellular events that compose the mind?  

Consciousness is not self-awareness or self-consciousness. I am conscious. This means that consciousness is a “given,” something whose existence we cannot dispute. It is located in the brain, but it is more than the brain. It is impossible that any material collection of cells, no matter how large and intricately related, could generate consciousness. A scientific materialist claims that there is nothing more to the mind than neurons and their electrochemical activities. The neural processes are conscious processes. However, if this kind of materialism is true, then I am only a “zombie” deluded into believing that I am conscious, and I cannot know anything about another’s mind. Thus, the “naive materialist” is forced to introduce the idea of two different appearances of the same fact. Therefore, the mind cannot be reduced to the brain, and the human phenomenology is not reducible to physiology. The mind is not the brain. Instead, an “emergent materialist” might argue that consciousness is based on neural processes but is not identical to them. However, there is still the question, with what is consciousness identical?  

Dualism is the belief that there are some empirical and contingent relations or parallels between brain and mind but no necessary link between them. There is no possibility of reducing the mind to the brain, because they are separate realms. This conception leads to two major problems within dualism. The first problem is the


“zombie” problem, in which dualism allows us to subtract the mind from the brain while leaving the brain completely intact. This possibility implies an “epiphenomenalism” that claims that mind does not matter, that it makes no difference what happens in the world, because it does not cause behavior. My zombie twin behaves just like me but it has no mind at all. The second problem is the “ghost” problem that is the converse of the zombie problem. If the mind is separate from the body, then not only can the brain exist without the mind but also the mind can exist without the brain. Thus, the so-called “disembodiment” becomes a real possibility.

The problem of materialism is that it tries to construct the mind out of properties that refuse to add up to the mind. The problem of dualism is that it cuts the mind off too radically from the brain. Therefore, a third solution between materialism and dualism must be found. Consciousness depends upon an unknowable natural property of the brain that can be the right kind of mediation between the world and the mind. We need a qualitative leap in our understanding of mind and brain. 30

Solutions of the mind-brain problem have been mainly epistemological. Locke thought that the mind is a blank slate, a “tabula rasa.” His idea was that intelligence is a storage of memory, a mental warehouse, and a problem-solving devise. Hume held that concepts are formed in the mind by a procedure of copying the impressions that the subject receives from the environment. He argued that there is nothing in the mind that was not previously in the senses. Thus, the Humean mind is a sensory photocopier. 31 Leibniz, who rejected both materialism and dualism, gave a rationalistic solution to the mind-body problem. He perceived that perception and consciousness could not be explained mechanically, and, hence, they could not be physical processes. His point was that whatever is the subject of perception and consciousness must be truly one, a single “I” properly regarded as one conscious being. An aggregate of matter is not truly one and so cannot be regarded as a single “I” capable of being the subject of a unified mental life. 32

31 Ibid., pp. 37-46.
Leibniz’s argument against materialism was that whatever is divisible is not a true unity. Matter is infinitely divisible. Hence, matter cannot form a true unity. Hence, matter cannot explain, be identical with, or give rise to perception. Because matter cannot explain perception, then materialism is false. Leibniz also rejected the dualism of Descartes, who argued that the world fundamentally consists of two disparate substances: extended material substance (body) and unextended thinking substance (mind). The world of Leibniz consisted solely of one type of substance, though there are infinitely many substances of that type. These substances are partless, unextended entities or “monads.” Although the mind and the body are composed of the same kind of substance, they are metaphysically distinct and non-causal but in a “preestablished harmony” with each other. According to this harmony, no state of a created substance has some state of another created substance; every non-initial, non-miraculous, state of a created substance has, as a real cause, some previous state of that very substance; and each created substance is programmed at creation in such a way that all its natural states and actions are carried out in conformity with all the natural states and actions of every other created substance. The real causal relation between mind and body is the mutual conformity or coordination of mind and body in accordance with the third statement. Each monad is a complete individual substance that contains all its features, its past, present, and future. Each monad is also a complete individual substance whose being is independent of everything else. There can be no interaction between substances, because they are “windowless” spaces.

There are, of course, all sorts of natural limitations in our intelligence because we do not have sensory impressions of all things. The most crucial point of the mind-brain problem is that we cannot see the mind, because it is the subject who sees and who is an unobservable entity. Consciousness has a hidden structure, a secret underside, and a covert essence, as, for example, Sigmund Freud perceived. It seems that there may be three levels within the mind, that of the surface of consciousness, that of the hidden structure of consciousness, and that of the unconsciousness, which is both affective and computational. Consciousness enables us to perceive the world, but it is not itself a

perceptible thing, because the mind may be non-spatial. Materialists reject non-spatiality of the mind, and dualists accept it. In fact, minds are causally connected to matter in space, so they cannot be entirely outside of space. They must belong to space in some sense. The mind is a non-spatial relative to our current conception of space. Thus, the mind-brain problem is not only the problem of the unknowable mind but also the problem of an inadequate concept of space.

Heim, by rejecting both materialism and dualism, led us to understand that a serious solution to the mind-body problem was hidden in his new ontological and dimensional “thinking in spaces.” He argued that consciousness is both a qualitative, subjective “mental” phenomenon, and at the same time a natural part of the physical world. In Heim’s dimensional doctrine, the mental phenomenon of self-consciousness belongs to the objectifiable “i”-space, where “I”-space is the non-objectifiable perspectival center of “i,” and between them prevails the dimensional inclusion: (I & i) ⊂ i. “I” and “i” are also in polar relation with each other, I ↔ i, and between them prevails the dimensional boundary, I/i. For example, I can know at least something about my consciousness, because it belongs to objectifiable space, which is the physical dimension of time. Nevertheless, I can never know anything about consciousness itself or “I”-space, because it belongs to non-objectifiable space, which is the eternal dimension of time. The seeing point cannot be seen. However, “I” and “i” belong inseparably together as a polar reality. I can also dimensionally know something about your consciousness, “t”-space, and even about the non-objectifiable “T”-spaces (both human and panpsychic) if or when they open upon me. The definition of polar reality: W ↔ w = ((I↔T)↔W) & ((I↔i)↔i) & (i↔t)↔w) explains Heim’s solution to the mind-body problem. According to it, the “mental” and subjective phenomena of “I” and “T” and their combination “W” or W-reality are the qualitative and eternally present “becoming” pole of reality, and the quantitative, physical, biological, and objective phenomena of “i” and “t” and their combination “w” or w-reality are the natural and always past “become” pole of reality.

The ontic structure of w-reality is open to investigations of sciences, whereas the

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34 McGinn, The Mysterious Flame, pp. 103-137.
35 GD, p. 51.
36 Heim’s position is quite similar to Searle’s “property monism," found in The Mystery of Consciousness p. xiv. See also Murphy, “Human Nature” in Whatever Happened to the Soul? pp. 1-2.
ontological structure of W-reality is not, because the knower and the known belong to the
two different dimensions of time, between which there is a dimensional boundary.

The main question of the mind-body problem, how the mind emerges from or is
caued by the brain, is misleading or at least one-sided, because, although the brain
processes “cause” states of consciousness, consciousness itself is not the only “emergent
property” of the brain but at the same time the always present epistemological, volitional,
and energetic center of the conscious brain. In Heim’s dimensional thinking, “either-or”
and “both-and” are simultaneous because of two-dimensional time.37

2. Contributions to Physics

In the first half of the twentieth century, scientists completely transformed the
study of physics. Physicists determined the internal structures of the atom, discovered
that mass could actually bend space and time, and found that the smallest known units of
mass and energy behaved paradoxically, both as waves and as particles. The scientific
advances in the second half of the twentieth century have for the most part simply applied
and extended the discoveries of the first half of the century. Max Born argued that the
great experiments and heroic theories have revolutionized our view of the physical world
and brought us closer to its underlying unity.38

From the viewpoint of physics, Heim’s dimensional doctrine was mostly based on
Einstein’s SR. Heim was less influenced by QM. He was interested in its principles of
indeterminacy and complementarity, but rejected the dualistic and idealistic conclusions
of Bohr and Heisenberg. For Heim, the principle of complementarity did not mean
dualism, but the polarity of intra-mundane reality. The indeterminacy principle of the
Copenhagen interpretation of QM made room for Heim’s conception of a two-

37 Heim did not investigate the mind-body problem as a separate problem in his work. See GD, pp. 162-
rejected the possibility that a “soul” could transmigrate. See GN, pp. 110-121, and chapter III.1. Instead,
he accepted the conception of “panpsychism,” which is space-type (4).
38 See Max Born, “Physics,” pp. 1-15. About the unity of knowledge, see Edward O. Wilson, Consilience.
The Unity of Knowledge(New York: Vintage Books, 1999), pp. 49-71. Heim’s WnWis a description of
this revolutionary development in physics in relation to theology and philosophy.
dimensional time, in which the physical time-dimension is determined, and the eternal time-dimension is undetermined. Heim’s dimensional thinking also provides some interpretations of physics. It has a serious ontological solution to the peculiarities of QM and an epistemological solution to its interpretations. The most valuable contribution of Heim’s dimensional doctrine for physics is, however, its conception of two-dimensional time.

A. Quantum mechanics

In order to understand the contribution of Heim’s dimensional thinking for QM and its interpretations, we must first outline of the main problems in QM. Then we must analyze some important philosophical interpretations of QM. Nils Bohr and Roger Penrose are our two examples from the huge variety of interpreters, because they represent “opposite” poles among the interpreters. After those analyses it is possible to point at the contribution of Heim’s dimensional thinking for the philosophical problems of QM.

According to physicists, reality could be described by classical and quantum mechanical physics. In practice, classical physics describes phenomena on a large scale with one set of laws applying at that level, and QM describes phenomena at the quantum level of activity with one set of laws applying at it. Most physicists believe that some day, if QM is understood fully, it will be possible to deduce classical physics from it.

Einstein saw the large-scale universe as a smooth, curved surface in four-dimensional space-time. Gravitation arises from the structure of that space-time continuum. The small-scale universe, on the other hand, is a collection of subatomic particles that cannot be precisely located in space and time but only described in statistical terms. The equations that describe extremely large gravitational fields are completely different from, and indeed in conflicting with, those for electromagnetism and subatomic interactions. Moreover, each theory is incomplete by itself. QM describes

39 See R.I.G. Hughes, The Structure and Interpretation of Quantum Mechanics (Cambridge, MA: Harvard University Press, 1989), in which Hughes has analyzed 177 interpretations of QM.
only an assortment of particles, mathematical constants and equations without fully understanding the sense and symmetry underlying them all.

Roger Penrose has illustrated and explained the above-described situation of physics in his book *The Large, the Small, and the Human Mind.* Three makeup constants are found in physics: the gravitational constant (G), the speed of light (c\(^{-1}\)), and the Dirac-Planck constant (\(\hbar\)). In Galilean physics, these all three constants are zero. In Newtonian gravitational theory, G is a non-zero constant. If c\(^{-1}\) is non-zero, we get the Poincaré-Einstein-Minkowski theory of SR. In Einstein’s GR both G and c\(^{-1}\) are non-zero. Allowing \(\hbar\) to be non-zero and G = c\(^{-1}\) = 0, we get the standard QM, and if c\(^{-1}\) is also non-zero, we get Quantum field theory. A theory of everything (T.O.E.) may be possible, if we could incorporate all three constants of physics to the Quantum theory of gravity.

“Mysteries ”of QM are composed mainly of two types: puzzle mysteries (Z), which are there in physical reality but not yet fully tested and understood, and paradox mysteries (X), which indicate that the theory is somehow incomplete. The Z-mysteries include a variety of phenomena, such as wave-particle duality, null measurements, spin, and non-local effects. One of the most striking problems is “quantum non-locality” or “quantum entanglement.” According to John Bell’s theorem, there is a conflict between the expectations of QM concerning the joint probabilities of the results of measurements at points A and B and any “local realistic model.” Penrose argues that in the non-local effects, events occur at separated points A and B, but they are connected in mysterious ways. They are entangled in such a way that there is no possibility of using that entanglement to send a signal from A to B without breaking the consistency of QM with GR, because it is impossible to send messages faster than light.

40 Roger Penrose (with Abner Shimony, Nancy Cartwright, and Stephen Hawking), *The Large, the Small* and the Human Mind (Cambridge: Cambridge University Press, 1999), p. 91. Fig. 2.22.
41 Penrose uses as a symbol of the velocity of light,”c\(^{-1}\),” instead of the usual symbol, “c.”
42 David Bohm has described it as a phenomenon in which a particle of spin 0 decays into two spin particles. For example, an electron and positron, going off in opposite directions in two different polarization states of “up” and “down.” The measurements at points A and B in any “local realistic” model tells us that the electron is a thing at A, and the positron is another thing at B, and they are not connected in any way. The measurement of the spin of the electron apparently instantaneously fixes the spin state of the positron.
The most essential X-mystery is the so-called “measurement problem,” which occurs by crossing from the quantum level to the classical level: the rules change when we magnify something. In other words, the problem arises from the fact that several principles of physics appear to be in conflict. In particular, the dynamic principles of QM seem to be in conflict with the postulate of collapse. The linear complex number weighted superpositions of the quantum level no longer maintain, and the ratios of these squared moduli become probabilities of two alternatives, but only in a situation of measurement. The most famous example of this “collapse of the wave function” or “reduction of the state vector” is “Schrödinger’s cat,” which could be in a state of being both dead and alive at the same time.

Penrose also argues that Niels Bohr and, especially, his followers in the Copenhagen school believed in QM, but they did not accept the state vector $|\Psi>$ as real, but only as the description of reality in the mind. This belief is based on the viewpoint of “decoherence,” according to which, the quantum mechanical state as a sum of all probability waves is changing continuously and looses its coherence when it interacts with the external world. Because of decoherence, macroscopic things also change quickly from one quantum state to another state so that the average of the unstable probability waves is zero. Instead, the physicists who represent “many-world view” take the state vector $|\Psi>$ as real. In this view, “Schrödinger’s cat” is indeed both alive and dead, but those “cats” somehow inhabit different universes. Louis de Broglie, for instance, stated that the reduction of the state vector has some role to play beyond standard QM, but no one would expect to find any new effects from QM. Penrose and his followers also take very seriously the possibility that something new, which is now missing from QM, will be discovered and change the structure of it. Something is wrong, if the principle of superposition applies to significantly differing space-time geometries.

Niels Bohr oscillated between realism and idealism in his debates with Einstein. As was discussed in Chapter I, Einstein was committed to the position of critical physical realism. Bohr saw epistemological problems in Einstein’s traditional views of classical realism and shifted to a position closer to the quantum idealism of Heisenberg. My

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44 About the mysteries of QM, see Penrose, The Large, pp. 50-92.
analysis will now focus on Bohr’s “neo-classical” interpretation of quantum mechanical problems and on his epistemological solution for them.45

Quantum mechanical problems occur when physicists try to deduce classical physics from QM. Bohr realized that physicists must use the laws of either the classical level or the quantum level, because one set of laws applies at the quantum level and another set of laws applies at the classical level. Bohr tried to avoid this situation by communicating between those two levels. Thus, it was necessary somehow to combine idealism and realism. His solution was a new definition of realism explained with the concept of “complementarity.” It is in principle a very close conception with a form of experimentally limited operationalism and positivistic idealism. Bohr believed that in any situation of measurement, the “state vector” is not actually in the world but in the mind of the observer, and the objective reality of the physical properties is evoked by the act of observation. Therefore, his complementarity is a kind of interaction of realism and idealism.

Bohr maintained that the physical properties of quantum systems depend upon experimental conditions in a fundamental way, including conditions of measurement. He stated that if quantity Q is measured in system S at time t then Q has a particular value in S at t. Instead of taking the dependence of properties upon experimental conditions to be causal in nature, he proposed an analogy with the dependence of relations of simultaneity upon frames of reference postulated in Einstein’s SR. Like temporal relations in SR, quantum properties in QM exhibit a hidden relationalism from a classical Newtonian point of view. Einstein rejected this argument of analogy, arguing instead that under ideal conditions, observations function like mirrors reflecting an independently existing reality. Einstein’s position means that physical reality is objective. Reality is independent of any measurement. Reality passively reflects rather than actively constitutes that which is observed. One can say that Bohr’s position was close to Kant’s ideas, whereas Einstein’s position was closer to that of Descartes and Locke.46

There is a methodological and epistemological boundary between the quantum level and the classical level. Bohr argued that there is no reason to hope that we may

45 See also Morrison, Einstein, Kant, Tillich, pp. 193-226.
someday achieve a more complete description of the phenomena at the quantum level. The epistemological lesson of QM is that reality is not only physical but also phenomenal or mental. Objectivity at the quantum level means the ordering and description of experiences of reality during interactions between observational systems and sub-atomic processes. Specific properties of momentum and position in sub-atomic particles are unknown, and, hence, they are objectively real only during the measurement of either momentum or position but not both at the same time. The dynamic unity of subject and object and its existence is apparently discontinuous. Heisenberg’s principle of indeterminacy or uncertainty and the problems of observation forced him into a methodological dualism and to an epistemological synthesis by the principle of complementarity. The doctrines of indeterminacy and uncertainty restore some room for notions of freedom in the conceptions of reality generated by QM, but at the same time, they rejected the principles of bivalency and causality. From the creative unity of the phenomenon between subject and object followed the rejection of Einstein’s critical realistic position and oscillation between the positions of realism and idealism.47

The position of Roger Penrose is a quantum version of physicalism. However, he is also an idealist. In his metaphysical world-view, there are three layers of reality. He believes that we live in the physical, mental, and mathematical worlds. The physical world attaches to the mental world, which in turn attaches to the mathematical world, and the mathematical world is the base of the physical world and so on around the circle. The most fundamental reality is mathematical. Penrose believes that the physical world in a sense emerges from the Platonic world of mathematics and from the mental world. In principle, the entire physical world can be described in terms of mathematics. Therefore, mathematical physics is the correct starting point for understanding the nature of consciousness.48

47 Henry J. Folse, Philosophy of Niels Bohr: The Framework of Complementarity (Amsterdam: North-Holland, 1985), p. 7, argues that Bohr was more realist than idealist. Roger Penrose, The Emperor’s New Mind: Concerning Computers, Minds, and the Laws of Physics (New York: Penguin, 1991), p. 226, argues that Bohr’s interpretation of QM provides merely a calculational procedure, and does not attempt to describe the world as it actually is. According to Jaki, Limits, pp. 40-41, the fallacy of Copenhagen interpretation of QM was the jumping from the operational to the ontological level, the denial of causality as a consequence.

Penrose’s ideal physicalism seems to resolve some problems of QM. His theory is a framework deploying such concepts as “state,” “observable,” “superposition,” “transition probability,” and “entanglement.” It is applied successfully to two different ontologies: the ontology of particles in the standard non-relativistic QM of electrons, atoms, molecules and crystals, and the ontology of fields in QED, quantum chromodynamics, and general quantum field theory. Penrose also tried to explain mental phenomena in physicalistic ontology through a delicate employment of quantum concepts. However, the problems of the actualization of potentialities and that of measurement are X-mysteries for him. The linear dynamics of QM precludes actualization by means of measurement. Penrose is skeptical about all attempts to explain these mysteries. The theory of many-world, decoherence, hidden variables, and so on, could not explain at what stage in a process of measurement the unitary evolution of the quantum state breaks down, and at what stage its actualization occurs. Is the stage physical in which a macroscopic system is entangled with a microscopic object, or a stage in which the metric of space-time is entangled with a material system, or is the stage mental occurring in the mind of the observer? Penrose hypothesizes that actualization must be a physical process, due to the instability of a superposition of two or more states of the metric of space-time. The greater the difference in energy among the superposed states, the shorter the lifetime of the superposition. But he also needs the superposition of the brain. Altogether, Penrose believed that the problems of QM are solvable, if we could discover a new theory.49

Heim was familiar with the beginning and earliest development of QM until 1958. He prudently realized the possibilities for a new worldpicture that was provided by QM. He described the discoveries of Planck, Bohr, Heisenberg, Schrödinger, Dirac, de Broglie, and Pauli, among others.

Heim did not explicitly argue that his dimensional doctrine had any solution for QM and the epistemological problems found in its Copenhagen interpretation. He stated that his new ontology had some epistemological contributions, but he did not name his

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49 Serge Haroche in “Entanglement, Decoherence and the Quantum/Classical Boundary” Physics Today (July 1998), pp. 36–42, proposes that it might be a “mesoscopic theory” between the macrocosmos and the microcosmos, in which decoherence occurs but slowly enough to be observed.
targets. The contribution of Heim’s dimensional thinking for QM not only applies to the epistemological problems of Bohr but also to the ontological problems of Penrose.

Like Bohr, Heim argued that reality has not only physical but also mental properties that lead to epistemological problems. Whereas Bohr tried to resolve such problems by a methodological dualism, that is, by his principle of complementarity, Heim argued it is not necessary to presuppose that reality is epistemologically dualistic. The point of departure for Heim was ontological monism, a “real-idealism” in which “physical” and “mental,” “physicalistic” and “phenomenalistic” properties form one polar reality. Bohr’s complementarity principle seems to be insufficient, because he could not avoid oscillation between realism and operationalistic idealism. Heim had a similar problem in that he oscillated between idealism and realism, as was discussed in Chapter III, but his concept of polarity is better than Bohr’s quite similar concept of complementary, because it does not presuppose that reality is dualistic.

The quantum boundary between the quantum level and the classical level of reality is not only epistemological, as Bohr believed. According to Heim’s dimensional doctrine, it is also an ontological and dimensional boundary between two infinite and limitless spaces: the non-objectifiable and objectifiable spaces of reality. The problems of QM are consequences of the dimensional boundary. In an experimental situation the problem is not the “entering” from the classical level to the quantum level or vice versa, which occurs within a space, but the “confrontation” or “meeting” between two polar spaces: the objectifiable w-reality and the non-objectifiable W-reality, within our five-dimensional world, where time is two-dimensional. The objectifiable, temporal, and physical w-reality is the object of measurements and observations of physicists (“T” or “T”). Physicists, thus, exist in the non-objectifiable and eternal W-reality, but are at the same time, the perspectival centers of w-reality. The “T”-space and “T”-space of physicists are space-type (3), but there are also “T”-spaces of type (4), namely, panpsychic spaces. Therefore, physicists do not confront or meet only sub-atomic objects but also non-objectifiable “T”-spaces, which at the same time are non-objectifiable centers of w-reality. Matter is not only made up of infinitely divisible particles but also of energetic events or processes, whose effects are objectifiable, but the energy itself is non-objectifiable. In this quantum mechanical confrontation of measurement and
observation, between “I”-space and “T”-spaces of the sub-atomic events, prevails the dimensional boundary, which can be crossed only passively, if the new and unknown “T”-spaces open upon us in a synthetical a priori event.

The “passive opening” of spaces in Heim’s dimensional doctrine differs from Bohr’s ideas of a constituting role of physicist in the situation of measurement. Instead, it is quite similar with Einstein’s phenomenon of “mirroring”. Einstein contented that under ideal conditions, observations and measurements function like “mirrors” or “camera obscura” reflecting an independent reality. When a direct measurement of physical reality occurs it merely passively reflects rather than actively constitutes that which is observed.  

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According to Heim, reality is not discontinuous, as Bohr believed, but continuous and holistic: natura non facit saltus, not quantum jumping, either. Thus, Heim’s solution was ontological holism. According to ontological holism, there are physical objects that are not wholly composed of basic physical parts. Views of Bohr, Bohm and others may be interpreted as endorsing some version of this thesis. In no case is it claimed that any physical object has non-physical parts. The idea is rather that some physical entities that we take to be wholly composed of a particular set of basic physical parts are in fact not so composed. Instead, Heim argued that physical objects really have non-physical parts. The core of every physical particle is the non-objectifiable T-space, pure energy.  

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There are many similarities between the world-views of Penrose and Heim. For example, the fundamental reality of Penrose is mathematical. Mathematical reality is “supra-polar” because there is no polarity within mathematics. The fundamental reality of Heim was also supra-polar, namely, the supra-polar space of God. However, according to Heim, it is not necessary to postulate any supra-polar reality for solutions to quantum mechanical puzzles and paradoxes. Those problems are solvable only within polar reality. Penrose awaits the emergence of a new theory from the Platonic sphere, or he hopes that someone will discover it in the near future. Heim also believed that physical reality could be described in terms of mathematics. For Heim it was possible

from the five-dimensional perspective, where time has two dimensions, the eternal and the physical.

The problem is, however, what kind of mathematics is valid for describing consciousness and free will. Penrose argues that because consciousness, and in the same sense also the quantum level of reality, is non-computational or non-algorithmic, it is impossible to apply any kind of mathematics for describing mental phenomena. According to Heim’s dimensional doctrine, it is not necessary to explain the unity of consciousness via quantum mechanical coherence. Instead, ontological categories of the objectifiable and non-objectifiable spaces, the dimensional boundary, and the polarity between spaces could describe both physical and mental reality as an interaction within two-dimensional time.

Like Kant, Bohr described “non-objectifiable” reality and capacities of the mind in the microphysical quantum level. Einstein described “objectifiable” reality of the physical, classical level. Both descriptions are incomplete alone. Penrose tried to combine both, but he could not resolve the problem without a proper concept of time.

B. Two-dimensional Time

Heim’s dimensional thinking and his conception of time are ontological. Therefore, we must at first analyze some metaphysical problems of time. Heim’s conception of time is also physical in the same sense as it was for Einstein. Therefore, we must next analyze Einstein’s time and its consequences in physics. In addition, the only two-dimensional theory of time currently discussed in physics is a superstring theory: the so-called F-theory. Therefore, I shall describe its conception of time. Then we can review the revolutionary treatment of Heim’s two-dimensional time to the discussion about time among philosophers and scientist.

There have been three paradigmatic topics about time in philosophical enquiry: change, causation, and possibility. 52 It is commonly accepted that only time, not space, is

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the dimension of change. On the one hand, genuine change involves temporal variation in the properties of things. On the other hand, it seems that time itself also changes, “passes,” or “flows.” It is the “always changing” event: the future is becoming the present, and the present is changing into the past. Change is an event that happens only in the present time, and this process is just the change of the motion and acceleration of time. It is the change that goes on in the event while it is occurring. A presentness of an event is its happening, as opposed to its having happened or being about to happen. Therefore, the things that change are existing things. Time also exists because it can be infinitely long or short as future-present and past-present. The present itself is only a point of the flux of time, not in a metaphorical but in a factual sense.53

Another issue follows from the ontological difference between the past and the future. Past individuals are as real as presently existing ones, but individuals of the future cannot be thought of as real. The ontological difference between the past and the future suggests that reality expands in the flux of time. More facts are added to the totality of facts. J.M.E. McTaggart believed unusually, that, time is unreal, and therefore, he rejected facts. He argued that the concept of time is so riddled with contradiction that it makes more sense to suppose that time does not exist at all. Impressions of temporality are mere human inventions. How can time move in time?54

Time is also understood without change. Temporal relationists believe that time is only the measure of change, as Aristotle thought. It itself does not change. Leibniz, for instance, thought that simultaneous temporal relations can be logically analyzed as the timeless properties of individual monads, and time itself is unreal, although it cannot be empty. Leibniz’s position is a form of reductionism. A solution for the possibility of empty time is that time is regarded as a possibility of temporal location. Therefore, the relationist project is an attempt to reduce instants to some other category.55

Temporal relations are not only definable in terms of change but also in terms of causal relations. The main point in causal theories of time is that time as a temporal becoming is asymmetric, deterministic, and continuous: if A causes or is among the

causes of B, then B does not cause or is not among the causes of A, and A is sufficient cause for effect B. The asymmetry of time also entails that time has a direction because causation has a direction. Time is the dimension of causality, and therefore, time cannot be empty. The direction of asymmetric time means also that time travel is impossible, as already Hume argued. Michael Dummett argues it is possible to imagine that there are causes that are simultaneous with their effects, and it may even be possible for the effects to precede their causes. Yet within one-dimensional time we cannot affect the past, because it is determined: any statement about the past has a determined truth-value. The future, instead, being unreal, is not yet determined. There is no fact about whether A will exist tomorrow, so anything I do now could make a difference for the future. If there are no ontological differences between the present and the future, then future-tense statements have a determined truth-value. Rejection of temporal becoming is therefore a rejection of free will.

The question, “Is it possible to escape the constraints the unchangeable direction of time places us?” has been the subject of many speculations during the histories of philosophy and of physics. Because it is possible to move freely in space, is it ridiculous to hope that we will some day move as freely backwards and forwards also in one-dimensional time? Time travel is possible if some kind of causal loops occur, or if time is a two-dimensional temporality. If time were a two-dimensional physical space of plane, then it would be possible also to move side ways on time. However, if the present is ontologically privileged or time is unreal, then there is nothing for the time-traveler to visit.

Time might be topologically closed, which means that every event is both before and after every other event. It is possible only if time is a two-dimensional plane. On the two-dimensional spherical surface of the earth every place is, analogously, both to the west and to the east of every other place. In a closed-time world, there could also be causal loops, and time would have no direction. In fact, this kind of world could be a fourth spatial dimension rather than a second dimension of time.

56 Michael Dummett, “Bringing about the Past,” in PT, pp. 117-133. For the same reason, Heim argued that time must be two-dimensional.
57 PT, pp. 6-10, and David Lewis, “The Paradoxes of Time Travel,” in PT, pp. 134-146.
Murray MacBeath believes that certain “gedanken experiments” would support the hypothesis that time really can be at least topologically two-dimensional. He asks why we assume that time has only a one-dimensional topology. Are there any a priori reasons in favor of the view? He defines dimensionality as follows: “a space has \textit{n} dimensions if there are \textit{n} respects in which its occupants can, qua occupants of that space, vary continuously but independently.” He also referred to Cantor, who proved that there are as many points on a line as in a plane, so that the two sets of points can be paired off one-to-one. Thus, our three-dimensional space could be only two- or one-dimensional without losing any point! However, if causal relations define the temporal relationship of time-space, it is impossible that the occupants of that space could vary in more than one causal respect. Every causal space is, thus only uni-dimensional, and therefore, physical time is also uni-dimensional.\textsuperscript{58}

Finally, time could be described as modal terms. Modal statements about time could take the forms: “necessarily \(p\)” or “possibly \(p\).” Those statements represent “alethic” modality, as opposed “deontic” modality (what ought to be the case) or “epistemic” modality (what might for all we know be the case). “Necessarily \(p\)” means that \(p\) is true in all possible worlds, and “possibly \(p\)” means that \(p\) is true at least in some world. The future is just a set of possible worlds, so the flux of time is the passage from the possible to the necessary. The link between the logic of possibility and the logic of time has been very close. However, there are some epistemological and ontological difficulties when modality is introduced to a causal theory of time. If causality is the mechanism by which we have knowledge of temporal relations, then there is some epistemological motivation for a non-modal causal theory of time. One might ask, why it is necessary to base causal relations on the possibility between events and not the actual temporal relations between them. It is only because time exists between two events that there is the possibility of change between those events. Modality, like time, is an obscure notion. It is not at all apparent that, by defining the second in terms of the first, we have clarified our ideas of either modality or time.\textsuperscript{59}

\textsuperscript{59} \textit{PT}, pp. 11-16.
There are many topological difficulties between time and modality. Is the structure of time necessary or contingent? Aristotle argued in favor of necessity, but Hume in favor of contingency. Hume also argued that time is not continuous but composed of discrete instants. Kant placed time into the mind as a form of pure reason without any physical dimension. Heidegger believed that ontic time runs forward, but ontological time goes backwards. W.H. Newton-Smith emphasized that because of philosophical difficulties, the topology of bounded or unbounded time is a matter to be settled empirically, and so belongs to physicists rather than to, for example, philosophers whose arguments are only “gedanken experimental fantasies.”

For Aristotle time was motion and, as such, only a measure of change. Galileo discovered that time is a measurable quantity. Newton’s time was absolute, true, and mathematical, which of itself and from its own nature, flows without relation to anything external. Material bodies move through space along predictable paths, subject to forces that accelerate them in accordance with strict mathematical laws. The universe was a gigantic mechanism of clock, predictable in every detail by the universal and absolute time. Time was simply there, and nothing could affect it. Newtonian time is calculus: the precise and continuous flux of the succession of universally present moments. Leibniz opposed this conception and argued that time is relative and as such an illusion. Newton’s conception was finally rejected by Einstein’s flexible and relative time 150 years later. Time became space. No longer is it possible to talk of time, but only the time of the individual observer depending on how s/he is moving. Einstein’s GR describes gravity not as a mysterious mechanical force operating at a distance but as a warping of space-time by the mass and energy in it, as acceleration that depends on the curvature of space-time. Mass tells space-time how to curve, and space-time tells mass how to move, but not at the same time.

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60 W.H. Newton-Smith, “The Beginning of Time,” in PT, pp. 168-182. “Gedanken experiments” are, however, as usual in physics as in philosophy. For example, Einstein created his theories of relativity only gedanken experimentally. GR was proved years later by physical experiments.

Physicists have tried to explain the mysteries of time in the theories of GR and QM by describing the same physical time at two different levels. The most peculiar problem of both descriptions had been "simultaneity." Prior to Einstein’s SR, it was generally believed that simultaneity was absolute: there was a unique event at location A that was simultaneous with a given event at location B. Einstein argued that it is necessary to make the following assumption in order to be able to compare the times of occurrence of events at spatially separated locations: the definition of so-called “standard synchrony.” Standard synchrony can be described in terms of a “gedanken experiment” in which the spatial locations A and B are fixed locations in a particular and arbitrary inertial frame of reference. For example, let a light ray, traveling in vacuum, leave A at time $t_1$ (as measured by a clock at rest there), and arrive at B coincident with the event E at B. Let the ray be instantaneously reflected back to A, arriving at time $t_2$. Standard synchrony is then defined by saying that E is simultaneous with the event at A that occurred at time $(t_1 + t_2)/2$. This definition is dependent on the requirement that the one-way speeds of the ray be the same on the two segments of its round-trip journey between A and B.

Hans Reichenbach, for instance, has argued in favor of Einstein’s thesis that the choice of standard synchrony is a convention rather than necessity of facts about physical reality. According to Reichenbach, the only non-conventional basis for claiming that two distinct events are not simultaneous would be the possibility of a causal influence connecting the events. However, no causal influence can travel faster than the velocity of light in a vacuum. Therefore, any event at A whose time of occurrence is in the open interval between $t_1$ and $t_2$ could be defined to be simultaneous with E: $t_1 + \varepsilon (t_2 - t_1)$, where $0 < \varepsilon < 1$. The thesis of conventionality asserts that any particular choice of $\varepsilon$ within its stated range is a matter of convention.

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63 Hans Reichenbach, The Philosophy of Space & Time, pp. 165-177, argued that there are no common “nows,” only inconsistent and conventional simultaneity between A and B. According to R. Lehti, “The Concept of Space in Relativity and Cosmology,” pp. 12-15, Einstein explained the Lorentz-contraction epistemologically, when he argued that a universal simultaneity is not possible. However, Lorentz-contraction is not epistemological but physical and ontological question. Heim argued ontologically that there is the common and absolute “now,” which is the second dimension of time.
Since the conventionality thesis rests upon the existence of the fastest causal signal, the existence of arbitrarily fast causal signals would refute the thesis. Those possible particles are called “tachyons,” if they could move with arbitrarily high velocities in consistence with the mathematical formalism of SR. The velocity of light in a vacuum is an upper limit to the possible speeds of ordinary particles, so-called “bradyons,” but it is a lower limit to the speeds of tachyons. When a transformation is made to a different inertial frame of reference, the velocities of both bradyons and tachyons change. At any instant, the speed of a bradylon can be transformed to zero and the speed of a tachyon can be transformed to an infinite value. Bradyons move forward in time, whereas tachyons may be or may not be. The possibility that tachyons in one-dimensional time could also move backwards leads to causal anomalies: a tachyon signal could be emitted by an observer and returned to that observer at an earlier time. SR does not imply that I can jump into my own future, only into some one else’s. Moreover, I cannot, by changing my state of motion, alter my here-and-now, only my there-and-now. The simultaneity, like motion, is relative, depending on the reference. If “there” is far enough away, it is possible that my here-and-now jumps either into the future or the past of an event E that takes place “there,” depending on whether I am moving towards or away from “there” at the time.

Einstein’s GR implies that the universe and time must have a beginning, and possibly an end. Causality determines that time must have a direction and that it is irreversible. The laws of thermodynamics verify the law of causality at least in the macrocosmos. The second law of thermodynamics determines that every closed system tends toward a state of total disorder. Entropy measures the degree of disorder in a system. Total entropy can never decrease; at best, it could remain the same. Time is an asymmetric quantity.

GR also implies that time is warping. Because a gravitational field is associated with warping time, it tells us how much time is dilated at each point in space. An infinite

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64 About “tachyons,” see, for example, Paul Davies, About Time pp. 79-80, 178, 234-235, 280. Einstein’s SR does not say that nothing can go faster than light but that nothing can cross the light barrier. The velocity of tachyons can be superluminal but not slower than light.

time warp could occur in a “black hole,” from which light would not be able to escape because of the infinite density of that space-time singularity. The event horizon of the space-time singularity is the boundary to time itself. It is possible that a singularity, the “Big Bang,” was once the spontaneous origin of time, and in black hole singularities and/or “Big Crunch” might be the end of time.66

At the quantum level of reality there is another basic limit that introduces an irreducible fuzziness to the notions of speed, rate, and time: Heisenberg’s uncertainty principle. Uncertainty in energy can be traded for uncertainty in time, but it is impossible to eliminate both indeterminacies simultaneously. To explain the so-called “tunneling effect” using uncertainty of energy-time, it is supposed that a particle is permitted to “borrow” energy for overcoming the energy barrier. Although it is not possible in general to say when tunneling actually happens in QM, it may be possible to measure how long it took. However, there is no absolute clock in QM, because all physical clocks are subject to quantum uncertainty, Einstein’s time is not Newton’s time but flexi-time, and time itself will be subject to quantum effects.67

When physicists have nothing more to say about physical time, and when they come closer to a “now” point, they shift from physics to metaphysics, and start speculating about the mystery of time. I have noted above that Einstein was seriously worried about the “now.” He thought that it was a question that lies beyond science.68 Eddington, instead, thought that our impression of becoming, of a flowing time, is so powerful and central to our experience that it must correspond to something in the objective world. He argued, “If I grasp the notion of existence because I myself exist, I grasp the notion of becoming because I myself become. It is the innermost Ego of all which is and becomes.” Eddington thought that we experience time in two distinct ways: externally through the senses and internally within the soul.69 Penrose has thought similarly that there is a discrepancy between our minds and the theories about the reality of the physical world. This fact is telling us something about physics that presumably

66 Davies, About Time pp. 33-35, 106-125, 131-132. I will later analyze the beginning and the end of time from the viewpoint of creation and eschatology.
67 Ibid., pp. 163-182.
68 See page 155, note 24.
must underlie our conscious perceptions. Paul Davies agrees with Eddington and Penrose that something important is missing from the physics of time. There must be “an inner sense of time buried deep within human consciousness, intimately associated with our sense of personal identity and our unshakable conviction that the future is still ‘open,’ capable of being molded by our chosen actions.”

Einstein proved that time is part of the physical word and presented his theories that interweave time with space and matter, but his revolution was unfinished. There is also a promising theory for a solution of the puzzles of space-time in physical reality, namely, the theory of superstrings. Edward Witten has claimed that the superstring theory will dominate the world of physics for the next fifty years, because superstring theory will lead to a new understanding of what space and time really are, the most dramatic understanding since GR. Ironically, although string theory has the potential to be the most predictive theory that physicists have ever constructed, they have yet to be able to make predictions with the precision necessary to confront experimental data. In fact, no one has even seen these strings, because they are much too small to be observed, about ten billion billion times smaller than a proton.

Since the 1980s, superstring theory has split into five theories: Type I theory, Type IIA theory, Type IIB theory, Heterotic type 0(32) theory (pronounced “oh-thirty-two”), and Heterotic type $E_8 \times E_8$ theory (pronounced “e-eight times-e-eight”). It is clear that not all different types of the superstring theory could be the true T.O.E. Therefore, physicists and mathematicians have been developing such new theories as M-theory (eleven-dimensional) and F-theory (twelve-dimensional), in which so-called “supergravity” (SUGRA), a field theory and the low-energy approximation of string theories, is the basic part. Supergravity seems to work in the eleven- or twelve-dimensional space, but nothing is really known of the structures of these theories. It seems that M-theory, those five theories of superstrings, and a sixth theory, eleven-dimensional supergravity, might be unified in a larger framework, in which between M and other theories prevails some kind

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70 Davies, About time, p. 276.
72 Kaku, Beyond Einstein, pp. 3-4. Green, The Elegant Universe, p. 211.
of duality or polarity. However, much of the true nature of M-theory and F-theory remains mysterious. M-theory may be the theory of ten spatial dimensions and one-dimensional time or something else.73 According to Christopher M. Hull, M-theory might be the theory of ten spatial dimensions and two time-dimensions. Cumrun Vafa, among others, is developing F-theory, where there are just ten spatial dimensions and two time dimensions. If time is two-dimensional, it is like the waves of the ocean on which we can swim forwards, backwards, and sidewardly. The old one-dimensional and linear flow of time may be only an illusion in our minds. However, superstring theory in its different modes has not been able to resolve what kind the second or other possible dimensions of time really are. Therefore, some theorists suggest that space and time are superfluous or illusions. A new kind of physics looms on the horizon, where space and time will merge completely.74

There is neither a philosophical nor a scientific theory that could yet explain what is time itself. Something vital remains missing. Some quality of time has been left out of the equations, or there may be more than one sort of time. Throughout the history of philosophy and physics, the main source of the confusion and contradictions about time has been the presupposition that time is either only a finite or infinite one-dimensional temporality, or that it is unreal and thus does not exist at all. Einstein plucked time from philosophy and placed it at the heart of physics, but he left things in a curiously unfinished state. In fact, he looked at time from the perspective of his theories of relativity, not from the perspective of time itself, that is, from the perspective of ontology.

73 Green, The Elegant Universe, pp. 182-183, 283-319, and Kaku, Introduction to Superstrings and M-Theory (Second Edition. New York: Springer-Verlag, 1999), p. 542-544. For criticism about M-theory, see, for example, Stanley L. Jaki, God and Cosmologists, pp. 258-259, according to which, the logic of M-theory is esoteric: “M” means “membrane,” but may also mean “magic” or “mystery.”

74 A theoretical physicist Julian Barbour argues in his heavily speculative The End of Time. The Next Revolution in Physics (New York: Oxford University Press, 1999) that while the laws of physics create the powerful illusion that the flow of time is real, there is increasing evidence that the universe is in fact timeless and motionless. He believes that the structures of the universe are static, while giving rise to the appearance of the flow of time. However, Barbour’s theory cannot prove why we experience temporality or why nature creates the impression of linear time, which is reversible, and historical time, which is irreversible. His theory is based on a metaphysical presupposition that reality must be timeless. His immeasurable “time capsules” or “nows” are quite similar to Heim’s second, eternal dimension of time. The difference is that Barbour talks about many “nows” and Heim only about one now: the absolute simultaneity. The flaw of Barbour’s theory is that, because it has no physical, measurable time-space (it is only illusion), it cannot explain reality. In fact, the term “nows” presupposes that time exists. It is a temporal distance between now-points.
and reality of time. After Einstein, physicists have answered many puzzles of time but are still a long way from solving the problem of time. In fact, no one has said anything new about the physical dimension of time since Einstein. Physicists have only explored consequences of Einstein’s theory of time and made some marginal notes to SR and GR. There are some philosophical and scientific speculations about two-dimensional time, but they are only “gedanken experiments” without an ontological foundation.

Heim’s time is ontologically justified two-dimensional space. Its first dimension is objectifiable, physical and temporal space, and its second dimension is non-objectifiable and eternal space, nunc aeternum. A dimensional boundary and polarity prevail between them, as I have shown.

According to Heim’s dimensional doctrine, there are, at first, objectifiable spaces in our “I-Thou-it” world. The objectifiable spaces of “i,” “t,” and their combination, “w,” are w-reality, “become.” w-reality is the relative physical and temporal dimension of time. Like Einstein’s time, Heim’s physical time is a relative space. It is impossible to talk about the time, but only time of individual observers, my time or your time, depending on how they are moving. In macrophysical w-reality, Einstein’s SR and GR prevail, whereas QM prevails in microphysical w-reality. Einstein’s famous equation $E = mc^2$ could be in Heim’s dimensional thinking the energetic $w = mc^2$.

Heim’s physical dimension of time as temporality is the dimension of change. It involves temporal variations in the properties of things, and it is an ever-changing event. The future of possibility is becoming the present, and the present is changing into the past of necessity. The physical present is only a dimensionless point of the flux of time. According to Heim, this flow of time is a secondary “become” or a process. It is an infinite or limitless, continuous, and irreversible sequence of successive present moments $(t_1, t_2, \ldots t_n)$. Thus, Heim’s temporal time does not begin at $t_0$, but at $t_1$. In other words, like Einstein, Heim argued that time has a beginning $t_1$ but maybe no end. It is not

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75 Heim argued that time is relative space already in 1902, in PA.
76 WnW, pp. 75-117.
77 GD, p. 61, 109. Heim’s temporal time does not begin at $t_0$, but at $t_1$. 
absolute but a relative and contingent continuum. As a temporal “to be come”, it is asymmetric and its direction is from the past to the future. Because the future of possibility is changing into the past of necessity, time is the dimension of causality, and as such, it cannot be empty. It is impossible to affect the past, because it is determined. Because causal loops are impossible in Heim’s physical dimension of time, and because its presence is privileged, time travel is not possible.

Einstein’s time and Heim’s physical time are similar, but they differ from each other at a crucial point. The “now” point was, for Einstein, the mysterious question that lies beyond science. He was right, but because he did not try to answer this crucial question, his concept of time was insufficient. Like Eddington, Heim thought that the “now” point of flowing physical time “is the innermost Ego, which is and becomes.” Penrose, for instance, has emphasized that something important is missing from the physics of time, because between the mind and physical reality is a discrepancy. According to Heim, this missing something is W-reality, which, as a non-objectifiable and eternal time-dimension, is beyond science, as Einstein clearly understood.

In our “I-Thou-it” world, there are also non-objectifiable spaces. Those non-objectifiable spaces of “I,” “T,” and their combination, “W,” are W-reality, “becoming.” It is the absolute “now,” the nunc aeternum. W-reality is a pure non-objectifiable energetic state, which could be explained in Heim’s dimensional thinking as the equation: \( W = - (mc^2) \).

According to Heim, the eternal time dimension is a primary “becoming” or a “transition.” It is a dimension in which the secondary “become” appears into existence. In other words, “not yet become” reality becomes “already become” reality. Thus, eternal time is bound with a certain location in the experienced world. Any certain point among other similar points in the continuum of physical time suddenly receives from the non-objectifiable space an accent that distinguishes it from the other points. However, the eternal “now” is at the same time beyond the continuum of physical time. It is everywhere in the universe. Therefore, simultaneity is relative and conventional only in

78 Heim’s position was vague. In GD, p. 179 and GN, p. 138, Heim argued that time is open and limitless, but in WW, p. 36, he claimed that physical time is closed. It has beginning and the end. “Die Welt nicht unendlich ist, sondern ein in sich abgeschlossenes Ganzes darstelle...”

the dimension of physical time but absolute in the dimension of eternal time. In the other words, Heim rejected absolute physical time, but he thought that eternal time was absolute. Newton’s flaw had been that he thought that time is only one-dimensional and physically absolute. In fact, Heim’s two-dimensional concept of time unifies Newtonian and Einsteinian physics. Newtonian physics is not only a limited case of Einsteinian physics but is also in an inverse order in two-dimensional time.  

According to Heim’s dimensional doctrine, the universe is not an empty container but a five-dimensional time-space in which the dimensional boundary prevail between spaces. This dimensional boundary also exists between physical and eternal continuums of time. It is physically the absolute velocity of light. Thus, $B_d = c^{-1}$. In addition, there is also the polarity between spaces. It is physically the absolute simultaneity within the continuum of physical time and the continuum of eternal time. Heim’s time could be illustrated as the following (Figure 4):

![Diagram of Heim's dimensional time concept](image)

The “here-and-now” point of “I”-space and “i”-space

The arrow of relative and physical time starts from the Big Bang singularity (W+w), and it ends in the Big Crunch singularity (w+W). The dimension of absolute and eternal time is everywhere, and so the “now” fills the whole universe. Polar w-reality and W-reality are constructed by the “now,” in other

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words from energy (electron(s)). Our constant “I” and its variable “i” are bound in the dimensionless point of the “here-and-now” of the dimension of relative and physical time. The supra-polar space P_s is present in every point of the polar spaces P_p. (Gray represents the past time in the dimension of physical time, and means the polarity).

3. Contributions to Theology

Heim did not write a summa theologiae. However, his whole oeuvre is theological. Heim emphasized that the fundamental aim of his lifework was to provide a new dimensional language for the means to message of the power of our Redeemer Lord Christ. He wanted to provide direction for how to understand and speak about God and His action in the world. From the ontological foundation of Heim’s dimensional doctrine, the christological and eschatological world-view of theology, philosophical world-view, and scientific worldpicture evolve into a coherent “worldpicture of the future,” a theology of nature.

Heim’s distinctive method was one of his remarkable contributions for theology. His point of departure was not a theological exegesis of the Bible, but a scientific interpretation of nature. First, he analyzed objectively the then-current scientific worldpicture. In his analysis, Heim wanted to speak as a physicist to physicists and as a biologist to biologists. He demythologized the scientific worldpicture from its dogmatism and its unnecessary and false ontological assumptions. He proved that science could never answer qualitative, immeasurable questions. Science has been able to answer only quantitative, measurable questions. Thus, he made room for the epistemological factor of non-objectifiable consciousness, and for supra-polar will and

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81 John Wheeler proposed that the entire universe is made of just one electron. See Kaku, Beyond Einstein, pp. 181-182.
82 Compare illustration of dimensional doctrine in chapter III.3.
83 WW, pp. 185-199.
84 Heim argued: “Alle Aufschlüsse, die wir über den Sinn der Welt und das Lebens gewinnen können, sind für uns also nicht dadurch erreichbar, dass wir uns eigene Gedanken über das Wesen Gottes und seine Schöpfungsordnungen machen, sondern dadurch, dass wir vom Tatbestand der Herrschaft Jesu ausgehen und dann darüber nachdenken, was sich aus diesem Tatbestand für das Verständnis der Welt und des menschlichen Dasein ergibt. Unser Denken kann also immer nur nachzeichnen, was uns durch die Wirklichkeit vorgegeben ist.” JH, p. 69.
belief. Only after the supra-polar space of God opens upon us, is it possible to understand God’s revelation and action in the world from this “central vision” (Zentralschau). Any scientific worldpicture must be seen in the christologic-eschatological horizon of revelation, and vice versa. He emphasized that neither scientific belief nor theological belief is privileged to be sacrifice of intellect. The world created by science or theology is not simply “out there,” objective to human perceiving, knowing, and evaluating. Reality and our “scientific” or “theological” reality are not identical. No kind of science is a mirror of nature but only an intelligent interpretation.\(^{85}\)

A. Heim’s Dimensional Cosmology

It seems that metaphysicians and theologians had given up the research of cosmology to physicists in the first half of the past century.\(^{86}\) Among theologians, Heim was like a “space probe” in this quest.\(^{87}\) The point of departure of his dimensional cosmology was a scientific analysis of the beginning of the universe.\(^{88}\) He explored questions about the genesis of the universe, its size and volume, the origin of our solar system, the origin of human life and its place within the organic world, based on what was known in the first half of the twentieth century. Although Heim’s knowledge of cosmology, astronomy, and biology was insufficient compared to our current knowledge, he provided an analysis of their essential questions in a modern manner.

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\(^{86}\) See essays in PPT.

\(^{87}\) See Horst W. Beck, “Ein prophetischer Außenseiter” in WW, pp.7-28. Karl Barth stated that as a principle the theological doctrine of creation should not concern itself with scientific descriptions and results. Pannenberg, Toward a Theology of Nature, p. 32, 48, noticed that in positive contrast to Barth, Heim was aware that theological talk about God as creator remains empty if it is not relatable to a scientific description of nature. Pannenberg, however, did not understand Heim’s theology of nature. He stated that Heim was uncritical concerning the conceptual foundation of natural science. Pannenberg himself gave priority to theology: “We must go beyond what the sciences provide and include our understanding of God if we are properly to understand nature.”

\(^{88}\) Heim used, for example, the following books: C.F. von Weizsäcker, Geschichte der Natur (1948) and Pascual Jordan, Die Entstehung der Sterne (1947). He was familiar also with the theories of Sir James Jeans, Arthur Eddington, Fred Hoyle, Edwin Hubble, and George Gamow, to which he referred, for example, WW, pp. 30-54.
Heim’s analysis started from Kant’s hypothesis concerning meteorites, Laplace’s nebular hypothesis, and their variations until the 1950s. In the beginning, something existed because of the dictum ex nihilo nil fit. The universe and our solar system within it were born from this material stuff in the singularity of the Big Bang (Anfangspunkt Nullpunkt) at least ten billion years ago. Because the Doppler effect has proved that the universe is now expanding, the universe must have had an explosive beginning from where space and time began. But what was in the beginning of the universe, and how did it become this explosion of singularity? The last theory known to Heim was the neutron theory of George Gamow, according to which, the universe began as pure neutrons in high density in which the neutrons began to convert to protons through the radioactive process of decay. Gamow, and before him Pascual Jordan, presented an idea of creating something from pure space-time. Jordan argued that a star by virtue of its mass obviously has energy. However, if the energy locked within its gravitational field was calculated, it was negative. The total energy of the system may, in fact, actually be zero. Therefore, it is possible that the entire universe was created as a quantum transition from pure space-time, without matter or energy. Since the given star had zero energy, there would be no violation of the conservation of energy if it were created out of nothing. Ed Tyron subsequently proposed a similar theory of creation as a fluctuation in a vacuum from pure space-time, where energy is zero.

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89 Immanuel Kant, Universal Natural History and Theory of the Heavens (1755). Kant had realized that the physical universe must have a center, which he identified with the point of largest density where the formation of word started following the creation of matter. See Stanley L. Jaki, Science & Creation. From Eternal Cycles to an Oscillating Universe, (Edinburgh: Scottish Academic Press, 1986), p.289. Stephen Hawking’s quantum cosmology starts with a similar presupposition as Kant’s theory, but without the thought of creation. See his “Quantum Cosmology,” in Hawking and Penrose, The Nature of Space and Time, pp. 75-103.

90 Pierre Simon Laplace, Exposition du système du monde (Explanation of the World System 1796) and Traité de Mécanique céleste (Treatise on Celestial Mechanics, five volumes, 1799-1825).

91 About the newest definitions of singularity, see Hawking, “Classical Theory” in Hawking and Penrose, The Nature of Space and Time, pp. 3-26. “A space-time is singular if it is timelike but cannot be embedded in a larger space-time.”

Heim argued based on Einstein’s SR and GR that the universe could not be infinite, but it is a finite and limitless entity. As such, it must have a weight and a volume. Within a relative universe there are, however, no absolute yardsticks of space and time. Measurements are always made from a perspectival center of the knowing subject in the world, and therefore, they are always relative. Because the universe is a bounded entirety, it must have a beginning and possibly an end. Heim asked three questions: When were our solar system and the entire universe born? Where are they born? If it is possible to answer those two questions, then it is possible to answer the third question: How were they born? In other words, if we could find answers to the questions about time-space, it is possible to describe adequately the process of cosmological evolution.

In order to answer the questions concerning time-space, it is necessary to understand the meaning of the “human factor.” The universe and the mind are inextricably correlated and mutually dependent on the relationship of polarity. Homo sapiens was determined at the beginning of the universe. We are constructed from the same stuff as the universe is. In the evolutionary process, we could see three tendencies toward Homo sapiens: an organic, teleological, and holistic tendency, the appearance of non-directional mutations toward alterations, and a natural selection that automatically annihilated useless genes and made room for conscious Homo sapiens, his genes, and culture, which is the end of biocultural evolution within the cosmological evolution of the universe. The question of why there are just these tendencies and nothing else is unanswerable. The entire universe is given and as such, it became “I-Thou-It”-reality,
which is a five-dimensional entirety with two time dimensions and three spatial dimensions.  

“In the beginning,” about which the Bible mythologically narrates, means according to Heim’s dimensional doctrine, all kinds of beginnings within the polar world that are at the same time the ends of an earlier interval of time. Therefore, the beginning of time itself cannot belong to the polar world. Heim’s two-dimensional, physical and eternal, time started from the singularity of W+w in the Big Bang, which was spontaneously created by the eternal Word of the supra-polar God.

According to Heim’s dimensional equation, because \( W = -(mc^2) \) (negative energy) and \( w = mc^2 \) (positive energy), then their sum is \( W + w = 0 \). In other words, the singularity of W+w was a point that has no energy. However, it was not absolute nothingness, because ex nihilo nil fit. Heim’s dimensional cosmology in GD was based on this conception. In the last volume, WW, however, Heim argued that creation occurred ex nihilo, which is in consonance with the main line of theology but not with the revelation and with science. According to the Bible, in the beginning was Logos, and the creation occurred from and through this eternal Logos. Heim tried to interpret this vagueness by arguing that the existence of all things in the world is always in a double relation: they exist in a polar and causal relation, and they exist dependent on God’s Word. Thus, all events in the world occur, on the one hand, within the polar spaces, and on the other hand, within the supra-polar world of God. In addition, God’s supra-polar

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95 WW pp. 54-86. Philip Hefner, The Human Factor. Evolution, Culture, and Religion, (Minneapolis, MN: Fortress Press, 1993), pp.277-279 argued in favor of “human factor” quite similarly with Heim who was quite close to the so-called “weak anthropic principle.” The weak anthropic principle (W.A.P.) states that we can observe the universe only from places and times where intelligent life can exist and can have evolved. The strong anthropic principle (S.A.P.) states that intelligent life must necessarily exist in the universe. See, for example, Nancey Murphy and George F.R. Ellis, On the Moral Nature of the Universe. Theology, Cosmology, and Ethics (Minneapolis, MN: Fortress Press, 1996), pp. 51-53 and Robert J. Russell, “Does the “God Who Acts” Really Act in Nature?” in ST, pp. 77-102. For Heim, however, human existence or the holism of nature were not proof of God’s existence, because from polarity is no way into supra-polarity.

96 WW pp. 87-114. Heim did not claim that God’s Word was “ultimate causation” or a scientific fact. It is only a biblical explanation about the fact, which remains always unanswerable for science. Paul Davies, “Is the Universe Absurd?” in ST, p. 69, claims “there is no need for a divine act, or suspension of the laws, to explain the Big Bang. It would be wrong to say that the laws of physics to which one appeals to explain the Big Bang came into existence with the universe (or for that matter after it), for one could not then appeal to those laws to explain the origin of the universe… The laws transcend space and time; they have an abstract timeless existence, and are in some sense more fundamental than the universe they seek to describe…”
space is present in every point of the polar spaces. The Big Bang in the beginning must have occurred in such a way that the singularity of W+w received a powerful energetic accent from the supra-polar space of God. The entire universe was created from pure time-space.  

The double relation just outlined is visible in the evolutionary process. Evolution occurs in polar w-reality, that is, in physical time. In a certain “singularity” within the evolution, one of the animals received unexpectedly from the supra-polar omnipotence of God an accent, call, or divine selection that selected it to evolve to become conscious Homo sapiens. The next step within human evolution was divine selection of Jesus of Nazareth. It is impossible to explain those special “singularities” or “mutations” in the evolutionary process causally, that is, within the dimension of relative and physical time. On the other hand, it also seems that the double origin of the universe, of Homo sapiens, and of Jesus Christ is contradictory if we think that time is only one-dimensional. From the viewpoint of two-dimensional time, there is no contradiction. W-w-reality exists in two spaces at the same time: both in temporal and in eternal space. In the absolute “now” point everywhere in the polar W-w-reality, there always is the supra-polar omnipresence of God’s space. The resurrection of Christ was not an historical event in physical time but the “singularity” of the new eschatological creation, whose purpose is the return of the polar creation, W+w, into the supra-polar world of God.  

According to Heim’s dimensional doctrine the origin of the universe occurred in the ( t₁ ) of physical time, from which started the whole cosmological and biological evolutionary process. Moreover, all creation occurs in the eternal “now” point. Human beings are a part of this determined and causal process of evolution or becoming in the

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97 WW p. 89. John 1: 1. “In the beginning was the Word, and the Word was with God, and the Word was God.” Compare Genesis 1:1. Hartle and Hawking have developed a theory of creation out of nothing in which the concept of time is defined only internally and becomes progressively less defined as we approach the singularity “at the beginning.” There are no boundary conditions, because there is no point of time at which the universe begins. See Christopher J. Isham, “Creation of the Universe as a Quantum Process” in PPT, pp. 375-408. According to Heim’s dimensional doctrine, there was a time-like point of singularity, W+w = 0, which is outside the dimension of physical time.

98 WW, pp. 90-104, JH, pp. 141-194, and Romans 1:3. Heim’s Christology was throughout his oeuvre consequently in line with St. Mark, St. John, and St Paul. Therefore, “incarnation” is seldom mentioned in his main work, “virginal birth” never. See Verena Grüter, Begegnung mit dem göttlichen Du pp. 300-316. Christ was incarnate Logos but for Heim “spiritual” Christ (Christos kata pneuma) was more important than “physical” Christ (Christos kata sarka).
dimension of physical time without any special status. On the other hand, God has created or selected us to be His co-creators (Gottebenbildlichkeit) in the undetermined and eternal dimension of time. There is no duality in the universe, because both dimensions of time belong inseparably together.99

The contribution of Heim’s dimensional thinking for theological (as also for scientific and metaphysical) cosmology is the concept of two-dimensional time. In other words, it is impossible to explain creation or the quantum singularity within one-dimensional and physical time, because it does not lead out of the polarity. The explanation of quantum fluctuation in science needs a two-dimensional time concept, where \( w = mc^2 \), \( W = -(mc^2) \), and \( w + W = 0 \). The theological doctrine of creation could be understood only from the viewpoint of two-dimensional time. In creation, the dimensions of temporal and eternal time cross each other at the eternal “now” point, where the supra-polar space of God is present as a creative activity. It is not necessary to presuppose that creation must be ex nihilo. It does not add any extra glory to God at all. Besides, the origin of the universe without the presupposition of creatio ex nihilo is the only scientific and biblical explanation, because of the law ex nihilo nil fit. All is from God, through God, and to God. For Heim, it was not necessary to prove God’s existence ontologically or teleologically, not even by argument from the evidence of design in nature or any kind of atrophic principles, because of his panentheism.100 Besides, it is impossible to prove God’s existence, because we have no way to move from our polarity into supra-polarity. Nevertheless, God is at the same time both transcendent and immanent, and Homo sapiens is His co-creator who participates in God’s continuing creation (creatio continua) of the world.101

99 WW p. 105-114.
100 According to Jens Dietmar Colditz, “Schöpfung aus dem Nichts. Die Schöpfungsaussage im naturwissenschaftlich-theologischen Dialog,” in GDJ, 1995, pp. 29-49, the Old Testament creation statements can be read as if a creatio ex nihilo is claimed. The New Testament witness to creation assumes the Old Testament understanding and validates it with a christological perspective. The molding of the concept of creatio ex nihilo first occurred within the early church. Theology employed this expression in order to express the absolute freedom and sovereignty of the Creator God.”
101 Ernan McMullin argues quite similarly with Heim that the doctrine of creation is not an explanation of a beginning at all, but an assertion of the world’s absolute dependence on God in every moment. Arthur Peacocke, although he argues in favor of panentheism, is closer to pantheism than panentheism. See Ian G. Barbour, “Ways of Relating Science and Theology” in PPT, pp. 35-36, and 42.
B. Dimensional Eschatology

Modern theologians have been mainly oriented toward the past or the present. Their eschatological perspectives have tended to be fixed on Bultmann’s and his follower’s existentialistic proclamation: “Every wave of time crashes on the shore of eternity.” Theology has not been interested in future apocalypses. Instead, cosmologists have made scientific assumptions about the future. Heim was on the side of the scientists in this instance. He analyzed all kinds of scientific prognoses of the future from the viewpoint of Einstein’s GR and the laws of thermodynamics. According to GR, space-time began at the singularity of the Big Bang and would end at the singularity of the Big Crunch. According to the laws of thermodynamics, the universe will run out of energy. The first of these laws, that of conservation of energy, was first formulated by J. R. Mayer in 1842. It says that in a closed system no more energy can come out than was put in. All one can do is move energy around or change its form. What energy might be lost appears in the form of heat. When all energy is turned into heat, the machine stops. Anyone trying to generate energy without fuel will run foul of the first law. In other words, perpetual motion is impossible. The second law of thermodynamics was formulated by Rudolf J. E. Claudius in 1850. It states that heat cannot of itself pass from a colder body to a hotter body. When energy has dissipated as heat, one cannot get it back again without using up at least as much energy in the process. In any closed system, disorder or entropy always increases with time.

There are three arrows of time. Entropy is the thermodynamic arrow of time, which distinguishes the past from the future, giving the irreversible and asymmetric direction to time. The irreversible and asymmetric psychological arrow of time, the

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102 Mark William Worthing, God, Greation, and Contemporary Physics (Minneapolis, MN: Fortress Press, 1996), pp. 161-162, hopes that “one can only hope that the dialogue between theology and science in the field of eschatology will begin with more mutual understanding and less suspicion than that which characterized much of the early dialogue over creation.”

103 WW, pp.116-131. See also Davies, About Time, pp. 84-87, and Hawking, A Brief History of Time, pp. 144-181. However, Ilya Prigogine argues that the behavior of dissipative systems is far from equilibrium. Living systems maintain their highly complex order by being dissipative systems. We breathe out entropy and create order out of chaos. See Polkinghorne, Science & Theology, pp. 43-44, and Hartmut Wehrt, “Symmetrie und Geschichte. Symmetrieprinzipien und gerichtete Zeit: Geschichtliches und ungeschichtliches Denken in der modernen Physik,” in GDJ, 1994, pp. 82-107.
direction in which we remember the past but not the future, is the second. The cosmological arrow of time, the direction in which the universe is expanding rather than contracting, is the third arrow. The first and second arrows cannot reverse; they always point in the same direction. However, the third will reverse, if the universe stops to expanding and begins to contract.  

From the second law of thermodynamics, Hermann von Helmholtz made a “scientific eschatological” prognosis in 1856, that the universe is dying, because entropy never falls and it cannot go on rising forever. The end of the universe is necessarily a thermodynamic equilibrium. It could be avoided, if there were an infinite energy source outside the universe. Before the death of the universe, stars will die, and among them, our sun will burn out and collapse under its own gravity into a white dwarf. The universe will continue to expand forever, but if the expansion decelerates fast enough, it may one day stop expanding and start to contract toward a Big Crunch.

For Heim, the destiny of the human race was more important than the fate of the universe. It is the key issue for understanding the true meaning of the ultimate fate of the universe. The prospect of a dying universe convinced Steven Weinberg to conclude his book about the first three minutes of the universe that all seems to be “pointless” and “meaningless.” Although the future of the universe and humankind as a part of this “ship” seems to be pessimistic, Heim did not speculate how we could avoid the ultimate death of the universe (by creating “super beings” or escaping from the “mother universe”

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104 See Hawking, A Brief History of Time, pp. 182-195. Hawking believes that a strong thermodynamic arrow is necessary for intelligent life to operate. In order to survive, human beings have to consume food, which is an ordered form of energy, and convert it into heat, which is a disordered form of energy. Thus, intelligent life would not exist in the contracting phase of the universe. See also Davies, About Time, 220-221, and Polkinghorne, Science & Theology, pp. 45-46.

105 WW, pp. 128-131, and Davies, The Last Three Minutes, pp. 37-48, 118-126. If the density of the mass energy of the universe would be bigger than the so-called critical density, then the universe must be finite but without boundary. The other possibility, that the geometry of the universe is not bounded but open or flat is gaining support from observation. It means, for example, that light is not bend by gravity but travels in straight lines, the volume of the universe may be infinite, and the universe will continue its steady expansion forever. A perfectly flat universe will keep on expanding forever, because there is not enough matter to make it recollapse in a Big Crunch. However, if the so-called “cosmological constant exists,” we cannot see beyond the event horizon. See Davies, About Time, pp. 157-162, and BBC News Online.

into “baby metaverses” through “worm holes”), but he drew attention to the
eschatological hope of humankind. According to Heim’s dimensional thinking, the destiny of our universe is the polarity of
time and spaces. In our “I-Thou-It” reality, there is dissonance between subject and object, and between the past and the present, that is, between w- and W-reality. What we can see belongs to the past, to w-reality. The deepest dissonance and disharmony prevail between “I” and “Thou,” which belong to W-reality. Everyone is nearest to him or herself, and the consequence is egoism. One is to another always a stranger. W-reality is the battleground of opposite wills. It follows that w-reality will become inhabitable sooner or later. This dissonance does not prevail only in the human world but also everywhere in the macrocosmos and microcosmos. The microcosmic “T”-spaces annihilate each other according to the law of polarity. The universe is under distress and chaos. There are two alternatives: either a hopeless or a hopeful future. Mankind has always hoped that from the content of the past and of the present could evolve a better future. According to Heim, the only hope is that the polarity between w- and W-reality will be abolished. In the other words, temporality must become annihilated.

According to Heim’s dimensional thinking, the polarity will be abolished at the
Big Crunch or telos, where w + W will recollapse to zero, and physical time ceases. However, the singularity of the beginning was not an absolute nothingness, so in the same way, the singularity of the end is not ceasing into emptiness but it is a “return” of temporality into eternity, polarity into supra-polarity in which God is all in all. Heim argued that when polarity is abolished, our Kantian a priori intuition forms of space and time will be altered to the a posteriori intuitive form of eternity, and we might not only “know the mind of God,” as Hawking hopes, but also see the divine Thou face to face. This eschatological hope is based on the resurrection of Christ, which was the first stage or “singularity” of the new creation. The risen Christ ascended to the supra-polar space.

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108 WW, pp. 141-144.
which is not a “metaverse” of many-worlds physicists but the “universe” of eternal freedom.\textsuperscript{109}

The contribution of Heim’s dimensional doctrine for the theological eschatology is its strong theology of nature. Heim’s dimensional eschatology was based on scientific discoveries of nature, but primarily it was also based on sources outside of science, namely, on dimensionally interpreted biblical truths. These two sources of knowledge and belief are unified systematically on the ontological foundation of his dimensional doctrine and its concepts of two-dimensional time and polarity.

\textsuperscript{109} WW, pp. 145-184.
CONCLUSION

Karl Heim was one of the first theologians in the twentieth century who saw that it was necessary to start a dialogue with scientists, philosophers, and theologians. To assist such a task, he constructed a “theology of nature”: an ontological theory of reality, where our existence, believing, and thinking are consonant. Heim’s dimensional doctrine was based on the concepts of space, boundary, and polarity within two-dimensional time.

Heim’s dimensional thinking evolved, on the one hand, from the basis of Kant’s critical idealism and its continuation in the German absolute idealism of Fichte, Schelling, and Hegel. Heim also built his ideas on the basis of Husserl’s phenomenology, the neo-Kantian critical idealism of Natorp and Rickert, and the existentialism of Heidegger. This mainly idealistic stream of thought was, however, one-sided and insufficient for describing all of reality. It needed the critical physical realism of Einstein for its polar basis. In addition, the quantum idealism of Heisenberg, although it oscillated between idealism and realism, made room for Heim’s two-dimensional time. Heim, however, constructed his own world-view beyond any mere combination of the above philosophies. The purpose of Heim’s ontological dimensional doctrine was the correction and expansion of Kant’s epistemological forms of intuition, space and time, and to bring together two opposite stances to reality, idealism and realism. This was possible on the basis of his concept of two-dimensional time.

According to Heim’s dimensional thinking, the basic concepts of reality are space (Raum), boundary (Grenze), and polarity (Polarität). The concept of space explains that reality is constructed by limitless and infinite n-dimensional spaces whose types are physical, mathematical, psychic or conscious, and panpsychic. We are able to know the existence of a new space, when it will be opened to us in a synthetic event or process a priori. We can realize synthetically a priori that we have existed in that for us unknown space.

The concept of boundary explains that there are two types of boundaries. The boundary of content prevails in one and same space. The boundary of dimension prevails between two or more spaces. In fact, the dimensional boundary is the velocity of light. From this conceptual double meaning of the concept of boundary, follow five necessary
distinctions. First, the contents and spaces must be separated. Next, both unity and difference prevail in the contents and in the spaces. Then, there is a relation of parts, that is, inclusion and subordination between contents and between spaces, and a contact between contents, and a confrontation or meeting between spaces. Finally, there are two different kinds of epistemological ways to know: the knowledge of content and the knowledge of dimension.

The concept of polarity argues that a double polarity prevails between spaces and their contents, that is, between opposite poles and their indifference condition. Polarity is neither a causal nor a logical relation but the “given” and original relation *sui generis*. In fact, it is absolute simultaneity.

Our world is the polar space of “I-thou-it”, and God’s world is the supra-polar space, which is, nevertheless, present at every point of our polar reality. We can know it, when or if it will be opened to us in a synthetic event *a priori*. Heim’s dimensional thinking clarified semantically the usage of philosophical and theological language. The old terms, such as “beyond,” “above,” “over,” or even “transcendent,” were no longer meaningful in expressions about the relationship between God, man, and the world.

Heim’s dimensional thinking is, even after fifty years, still one of the most remarkable endeavors to find an intelligent answer to the ultimate metaphysical questions. However, some logical, semantical, and ontological problems are unanswered in Heim’s dimensional thinking, as this critical analysis has shown. I shall conclude them as the following:

The basic concept of space in Heim’s dimensional thinking (*Philosophie der Räume*) was certainly a notable contribution to the discussion between science, philosophy, and theology. However, there are some semantical and ontological controversies or at least controversial points in Heim’s definitions. Heim defined the concept of space by using the concepts of mathematical sets, which means that the whole conceptualization of the mathematical sets keeps up with Heim’s definition, for example, the so-called continuum-problem. On the other hand, there may be no continuum on the fundamental level of the string or loop theories of Quantum gravity. However, Heim emphasized that his concept of space is only analogous with the mathematical concept of space. Thus, the question is what is the exact meaning of “analogous” in this case. Is
“space” ontologically real, or only metaphorical, as, for example, Pannenberg has argued? Heim himself argued that his operative spaces “I,” “T,” “i” and “t,” and their combinations “W” and “w” are ontologically real.

The opening of spaces, which according to Heim, occurs as a gift, as a paradox, and by a synthetic event \( a \text{ priori} \), is, according to logical empirism, semantically confusing. According to Kant and most of his followers, it is, however, adequate. Popper, among others, accepted synthetic judgments \( a \text{ priori} \), but he stated that they are usually false \( a \text{ posteriori} \). Heim himself did not argue in favor of synthetic judgments \( a \text{ priori} \) but synthetic events \( a \text{ priori} \).

The conceptual distinction between the boundary of content and of dimension is semantically the crucial point in Heim’s dimensional doctrine. On the one hand, it means a clear and correct usage of language in our scientific era. It is necessary to use this distinction, if we are to avoid epistemological contradictions. On the other hand, however, \( B_d \) is problematic, because its meaning is partly dependent on the concept of “opening.” If \( B_d \) is interpreted as a limit of the velocity of light, \( B_d = c^{-1} \), as I have argued, it has a serious contribution to physics, especially to the interpretation of QM.

Heim did not clearly distinguish \( m \)-, \( f \)-, and \( q \)-languages from each other. This is a reason for semantical confusions in his dimensional thinking. In addition, Heim wanted to avoid all kinds of metalanguages. Therefore, he used only ordinary language but at the cost of semantically inadequate communication.

According to Heim, polarity is the most fundamental law in reality (\( \text{Weltformel} \)). However, there are some modal logical problems in its use within Heim’s dimensional doctrine. We must ask, because we do not know, what is Heim’s idea concerning polarity (\( P_p \))? Is \( P_p \) necessary, possible, or contingent in all cases? Heim argued that it prevails necessarily in intra-mundane reality, but not in supra-mundane reality. Thus, the former is necessary, and the latter is contingent, which means that God’s supra-polar space (\( P_s \)) is possible but not necessary. Heim thus reversed the traditional belief that the world is contingent, whereas God is necessary.

Heim’s “second Copernican revolution,” \( P_s \) or “supra-polarity,” is the most crucial idea (\( \text{articulus stantis et cadentis} \)) of his dimensional thinking. It is also the most criticized point of Heim’s thinking. The way from \( P_p \) to \( P_s \) is by way of negation (\( \text{via} \).
negationis): “non”-polarity, “non”-spatial, or “non”-temporal. From the logical negation, however, nothing follows in the context of existence. P_s is only a necessary postulate. In addition, the “opening” of P_s is as controversial as the “opening” of the spaces of P_p, because of problems of synthetic a priori. However, the ontological attitude of logical empirism to existential entities may be too strict and as a metaphysical assumption, in fact, against its own premise, because it rejects all metaphysical sentences as meaningless. Thus, it cannot have any ontological attitude, and it cannot say anything about existence. According to both critical realism and pragmatic realism, Heim’s concept of supra-polarity can be tolerable as a theoretical, practical, and operative concept, because, for example, it is as a necessary concept in Heim’s dimensional thinking as the “electron” is in physics.

Concerning the intension of Heim’s dimensional thinking, I shall conclude that Heim did not clearly distinguish between f- and φ-languages. Therefore, for example, i-space can be either phenomenal or physical. When Heim analyzed objectifiable reality, he was more physicalist and realist, and when he analyzed the non-objectifiable reality, he was more phenomenalist and idealist. He tried to unify both physicalism (realism) and phenomenalism (idealism), but his ordinary language was vague, because he did not want to use any metalanguage.

The most crucial problems in Heim’s work after supra-polarity (P_s), are I/i, I=i, (I&i) ⊂ i, I | i, and I □ i. Heim tried to construct a synthesis between idealism and realism, but he could not completely avoid the antinomy between subject and object. Heim’s claims oscillated between idealism and realism. He was an idealist on non-objectifiable reality, and a realist on objectifiable reality. However, the concept of two-dimensional time of his dimensional thinking provides a useful ontological tool for resolving this epistemological problem, as I have argued in my analysis.

P_s | P_p, as dialogue between God and “I,” means some kind of polar relation, which is against the definition of the supra-polarity. Namely, “I am because God exists,” but the second condition of polarity, “God is, because I am,” is obviously impossible. In addition, P_p prevails in P_s between S_God and S_Satan, which is not possible, because of the definition of supra-polarity. Heim’s thought that the polar will and belief have some kind of supra-polar properties is also a controversial idea, which is against the definition of
space-type (3). On the other hand, if we accept that will and belief have powerful supra-polar properties, the history of the world and religions would be more understandable.

According to Heim’s dimensional doctrine, reality is monistic and there are three levels of relations: transcendent, non-objectifiable, and objectifiable. Dimensional boundaries and polarity prevail between the intra-mundane spaces within the supra-polar hyperspace that is God’s space. Heim’s world-view is not pantheistic but panentheistic, because God’s supra-polar space is present (not identical) in every point of polar reality. Heim’s world-view is also dynamic, because polarity prevails between non-objectifiable and objectifiable spaces. Thus, reality is not experienced as a static state but also as dynamic action.

Despite the fact, that in the basic concepts and the intension of Heim’s dimensional thinking, there are some controversial points, it provides serious solutions to the important ontological and epistemological problems. Heim claimed that, at first, it is necessary to construct a common and intelligible theory, on which a fruitful discussion among philosophers, scientists, and theologians is possible without a sacrificium intellectus. Heim’s ontological dimensional doctrine could be a basis for all further endeavors in this field of discussion about ultimate metaphysical questions. Heim’s primary purpose was only to make room for believing in and thinking of divine revelation and action in the world. He never tried to prove God’s existence, because such proofs are epistemologically and ontologically impossible in the polar world. However, his dimensional doctrine provides serious epistemological and ontological solutions for other kinds of ultimate problems found in philosophy, physics, and theology. Regrettably, Heim himself did not enter the soil, which he had liberated with his revolutionary thinking. Therefore, I have used Heim’s dimensional doctrine and its formalized language as a yardstick to show what kind of contributions it would have to philosophy, physics, and theology.

From the viewpoint of philosophy, the purpose of Heim’s dimensional doctrine was an expansion of Kant’s epistemological forms of intuition, that is, space and time. Heim proved that Kant’s epistemological scheme of a priori forms of intuition and categories of sense can map sensations, but are not able to map the ontological side of objective reality, which is independent from our sensations and the ability of the mind to
construct it. Kant’s space was the formal *a priori* condition of outer experiences, and time was the formal *a priori* condition of appearances. Neither had any physical status. Heim rejected this idea and argued that it is necessary that time and space are a unity, time-space, and that it has both physical and phenomenal status. Time must be the physical and experienced two-dimensional space.

Heim changed Kant’s epistemological question “How are synthetic *a priori* judgments possible?” to an ontological question “What kinds of ontological relations and events prevail between minds and objects?” For Heim, the opening of “i”-space upon “I”-space is synthetic *a priori* and non-propositional event, which occurs in two-dimensional time-space. The limit between subject and object is the ontological, “dimensional” boundary between two spaces, not only an epistemological horizon of contents within a space. Thus, the crucial difference between Kant and Heim was that Kant made epistemological and propositional claims about objects within a space and time of pure reason, whereas Heim made non-propositional and ontological conclusions about events between “I” and “i,” that is, between the epistemological subject and its object.

Kant’s epistemological separation of reality into the realms of phenomena and noumena was, in fact, Platonic and dualistic. It was based on his incorrect concepts of space and time. Kant’s space and time are only *a priori* forms inside the mind and as such do not inhere in things-in-themselves. Heim’s reality was a monistic unity, where there are only dimensional and polar relations between non-objectifiable subjects and their objects within two-dimensional time-space. Heim rejected Kant’s thought that it is impossible to overcome the transcendental horizon that separates phenomena and noumena from each other, and to know anything about noumena. He argued that we could know dimensionally, intersubjectively, and continuously more and more, not only about things-it-themselves but also about the universe as a finite and causal entirety. Heim agreed with Kant that there is no way to prove God’s existence, that is, there is no way from the polarity into the supra-polarity. However, the most crucial difference between Kant and Heim was a fundamentally different concept of time. Kant thought that it was only a form of the mind, whereas Heim argued that it must be two-dimensional space: physical and eternal.
Heim’s dimensional doctrine provides also a solution for the controversy between realism and idealism. Heim claimed that on the basis of the traditional concept of one-dimensional, temporal, and physical time, it is possible to take either the position of idealism or realism. The synthesis of realism and idealism is possible only on the basis of his concept of two-dimensional time. Heim proved that the German idealism of Fichte, Schelling, and Hegel, the existentialism of Heidegger, the critical physical realism of Einstein, and the quantum idealism of Heisenberg were ultimately based on either idealism or realism, or they oscillated between idealism and realism, and therefore, they were insufficient descriptions of reality. Only Schelling’s “ideal-realism” was a similar endeavor to unify idealism and realism, but it failed, because Schelling ignored his own basic concept of “polarity.” Because Heim combined ontologically both objectifiable and non-objectifiable reality, that is, the physical and eternal dimensions of time, it was possible to avoid the epistemological controversy between idealism and realism, and thus, unify idealism and realism.

Heim’s dimensional doctrine provides also a solution for the mind-body problem. It is not possible to resolve the problem on the basis of either materialism or dualism but only on the basis of his concept of two-dimensional time-space. Heim proved that consciousness is both a qualitative, subjective, and mental phenomenon, and a natural part of the physical world. The mental and subjective phenomena of “I” and “T,” and their combination “W,” are the qualitatively and eternally present “to be becoming” pole of reality. The quantitative, physical, biological, and objective phenomena of “i” and “t,” and their combination “w,” are the natural and always past “to be become” pole of reality. Because the mind belongs to W-reality, and the body belongs to w-reality, it is not possible to know anything about the mind itself. In other words, the non-objectifiable knower and the objectifiable known belong to two different dimensions of time, and the dimensional boundary ($B_d = c^{-1}$) prevails between them. There is no signal faster than the velocity of light. However, the mind and the body belong inseparably together. The “I”-space is the epistemological, volitional, and energetic center of the conscious brain, the “i”-space.

Heim’s dimensional doctrine provides a serious ontological solution to the peculiarities of QM and an epistemological solution to its interpretations. Heim proved
that it is not necessary to presuppose that reality is epistemologically dualistic. Bohr’s complementarity principle was inadequate. The quantum boundary between the quantum level and the classical level of reality is not only epistemological but also ontological. The dimensional boundary prevails between two infinite and limitless spaces, that is, the velocity of light ($B_d$) separates the non-objectifiable and objectifiable realms of reality. Reality is “physical” and “mental,” but it is not discontinuous, as Bohr believed, but continuous and holistic.

The problem of measurement occurs because it is impossible to measure the non-objectifiable energy, that is, the “T”-space, which belongs to W-reality. Physicists can measure only the objectifiable “t”-space, that is, the effects of energy, which belong to w-reality. Heim’s solution for the problem of measurement was that it must describe both physical and mental reality as an interaction within two-dimensional time. Both the dimensional boundary (the velocity of light) and the polarity (the absolute simultaneity) prevail between W-reality and w-reality. It might be possible to construct a theory in which this ontological state could be also mathematically resolved.

Heim’s dimensional doctrine proves that the reason of both philosophical and scientific confusions is an insufficient concept of time. Einstein proved that the physical dimension of time is not absolute but flexible and relative. Time became space, which is dependent on the movement of the individual observer. However, Einstein’s revolution was unfinished. He could not resolve the problems of simultaneity and “now,” because he ignored the “internal” time of the observer. All endeavors of physicists to resolve those problems have failed, because of their inadequate concept of time. For example, the F-theory of superstrings, in which time is two-dimensional but physical, could not be any adequate T.O.E. because it ignores the non-objectifiable and eternal dimension of time.

Heim’s time is an ontologically justified two-dimensional space. Its first dimension is objectifiable, physical, temporal, and relative, and the second dimension is non-objectifiable, mental, eternal, and absolute. The dimensional boundary, that is, the velocity of light ($B_d = c^{-1}$) prevails between them in the physical time-dimension, and the polarity, that is the absolute simultaneity, prevails between them in the eternal dimension of time. Einstein’s famous equation $E = mc^2$ is the energetic $w = mc^2$ in Heim’s
dimensional thinking. It is the secondary “to be become” or “process” in the asymmetric and causal flux of time within w-reality. The primary “to be becoming” or “transition” is the eternal and absolute “now” point everywhere within the universe. It could be explained as the equation $W = -(mc^2)$. Thus, the two-dimensional time of Heim’s dimensional thinking combined the Einsteinian and Newtonian physics.

Heim’s dimensional thinking as such is a remarkable contribution for theology. When he analyzed theological questions, his language was not only theological but also philosophical and scientific. He emphasized that neither theological nor scientific thought is privileged to be absurd, a sacrifice of intellect.

Heim proved that it is impossible to describe creation within one-dimensional physical time, because it does not lead out of polarity. Instead, from the viewpoint of two-dimensional time, both scientific and theological cosmology becomes meaningful. *Creatio ex nihilo* as a polar description is a false idea both in scientific and in the biblical context. Theologians have overestimated the support of the quantum physical theories of creation out of “nothing,” that is, creation as a vacuum fluctuation from pure space-time, to their own theory of *creatio ex nihilo*, which was constructed for the glory of God. Those theories cannot answer the questions when and where was the universe created, and so the question of how remains unanswered.

In the dimensional cosmology of Heim, the key question is the “human factor” in the universe. The universe became a polar “I-Thou-It” reality, which is a five-dimensional entirety with two dimensions of time and three spatial dimensions. The missing part of all cosmological theories is, in fact, time itself, which was “in the beginning” a supra-polar singularity, $W+w$. This singularity received a powerful energetic accent from the supra-polar space of God. Thus, the universe was created from the pure time-space, but not *ex nihilo*. Conscious human beings were created similarly: in a certain singularity of the evolutionary process, one of the animals received unexpectedly an accent or divine selection from the supra-polar omnipotence of God. The Resurrection of Jesus Christ was the next step within the evolution toward *consummatio mundi*, which means according to Heim, the return of polar creation into the supra-polar world of God.
Heim argued that the destiny of the universe is the polarity. The hope in the Heim’s dimensional eschatology is that the polarity between and within W-reality and W-reality will be abolished. It means that all temporality must become annihilated. Eschatological *consummatio mundi* will be, not the “Big Crunch” but the “Big Chance,” which means that the polar temporality returns into the eternal supra-polarity, where God is all in all.

The main contribution of Heim’s dimensional thinking is its concept of two-dimensional time. It provides serious solutions to the ultimate epistemological and ontological questions of philosophy, science, and theology. It is impossible to answer those questions only on the basis of the concept of one-dimensional and physical time. The above-analyzed philosophies and scientific theories have failed because they have ignored the “eternal factor,” that is, the second dimension of time-space. Heim’s dimensional thinking provides a remarkable ontological theory and language for the basis to continue the discussion among philosophers, scientists, and theologians. It makes the universe, which is our destiny, more understandable. The “worldpicture of the future” was Heim’s dream in his long journey. However, it is possible to reach the whole picture only at the end of time, where T.O.E. is neither theories nor dreams but a *visio Dei beatifica.*
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<td>CTNS</td>
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PA  Karl Heim, Psychologismus oder Antipsychologismus Berlin: C.A. Schwetschke und Sohn, 1902


WZ  Karl Heim, Das Weltbild der Zukunft Wuppertal: Aussaat Verlag, 1980.
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