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THE RECEPTION OF THE COPERNICAN UNIVERSE
BY REPRESENTATIVES OF 17TH-CENTURY
JEWISH PHILOSOPHY AND THEIR SEARCH
FOR HARMONY BETWEEN THE SCIENTIFIC
AND RELIGIOUS IMAGES OF THE WORLD
(DAVID GANS AND JOSEPH SOLOMON DELMEDIGO)*INTRODUCTION:
THE CONTEXT OF THE RECEPTION

Studies on Jewish involvement in European scientific research in the modern period at the turn of the 16th and 17th centuries emphasize the fact that Jews belonged, as it were, to two worlds: the sphere of culture and science, which developed new concepts using a new methodology, and the environment of Jewish tradition and religion (cf. FRIEDENWALD 1922, 133–211; YOSHIKO REED 2007, 461–495; RUDERMAN 2001, 54–60). The related difficulties were similar to those encountered by traditionalist Christians, although in the case of the representatives of the Jewish community an additional element appeared in the form of a crisis of religious identity. Traditional religious beliefs and practices were, in fact, the factors that built the life and uniqueness of the Jewish community. Therefore, for representatives of Judaism, the crisis that would arise in this sphere

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could lead to a crisis of national Jewish identity. It is true that during the period at hand, philosophy of nature and the emerging modern science rather seldom evoked attitudes of extreme rationalism that would have been able to threaten Jewish beliefs. Nevertheless, it is possible to speak of a gradual increase in the worldview and consequently also social conflict between the traditional Jewish community and the progressive non-Jewish community, which was a further development of the earlier political and cultural conflict expressed in the ostracism and persecution of Jews in the 15th century in, *inter alia*, Spain, Portugal, and France (SOYER 2007; POPKIN 1992, 248–269). Thus, the interaction between Jews and Christians often generated conflict, and the encounter of the Jewish tradition and modern philosophy and science fueled it even more (cf. Deutsch 1945, 239–251).

However, for many Jewish thinkers, this was a situation that they sought to change by overcoming mutual alienation and hostility, engaging in dialogue, and seeking what could bring them together. That is why they saw in the emerging natural sciences the possibility of overcoming the state of conflict through the meeting on the ground of science of scholars from cultural and religious backgrounds.

Of course, it was not easy in practice, not only because of mutual prejudices and injuries, but also and above all because of Judaism's ambivalent attitude to scientific knowledge of the world.¹ The attitude of Jewish thinkers to emerging modern science and the scientific method is well characterized by the triad: tension – aspirations – identity. The tension concerns the political and social situation related to the problematic relations between the Jewish community and the non-Jewish inhabitants of 16th- and 17th-century Europe. Aspirations indicate the desire and ambition of an influential group of representatives of Judaism to break through their isolation and achieve a social status that would enable them to be among the intellectual elite of that time and gain the respect accorded to educated people. Finally, identity means the growing problem of defining oneself both to “the compatriots” and to “the strangers” in the context of one's own religious-cultural tradition, as well as determining the degree to which it is obligatory in one's own life.

In order to trace and show in more detail the attitudes mentioned above and the processes accompanying them, it is necessary to look at the views and actions of the representatives of Jewish thought at the turn of the 16th and 17th centuries. To exemplify, let us look at the reception of the Copernican cosmological model, a theory that strongly influenced the transformation of the image of the world at

¹ On this point, see the interesting analysis in SAMUELSON 2009.

the time and marked an intellectual revolution that at the same time challenged religious explanations. This article aims to outline the positions of David Gans (1541–1613) and Joseph Solomon Delmedigo (1591–1655) on the reception of the Copernican model of the universe on the background of their attitude towards the natural sciences and their understanding of these sciences as a place of encounter and dialogue between Jews and Christians. In choosing these two Jewish thinkers (who are relatively little known), I used the criterion of their representativeness to the raised issue and the importance they had for the process of bringing the two communities together. Therefore, it is worth restoring the memory of their figures and achievements, the more so that the issue of the relationship between science and religion and the resulting discussions on worldviews still occupy the minds of many contemporary representatives of science and religion. Christianity has also been struggling for centuries with the problem of the conflict between various images of the world (scientific-natural and theological), and one can find in it positions both open to the progress of science, as well as fundamentalist positions that defend the literal interpretation of the biblical message about the world and man. So in this respect, it is no different from Judaism. Moreover, the pragmatic aspect of scientific activity will be shown, which manifests itself in treating science as a kind of tool, serving as a contributor to the creation of a mutually friendly intellectual climate of modern Europe.

In analyzing the first reception of the Copernican model of the universe by Jewish thinkers, it is essential to take into account the context that accompanied this reception. First, the emerging modern natural sciences were a significant and demanding challenge to the religious (Judaic) worldview. Secondly, the world view, changing under the influence of scientific developments, gave rise to the danger of a crisis of national Jewish identity. Third, the numerous and still emerging tensions between the Jewish and Christian communities forced the search for ways to defuse and eliminate them. One such way was to treat science as both a place of consensual encounters between the two communities and a space for collaboration and dialogue. Therefore, the activity of the representatives of Judaism in the academic field also served the realization of non-scientific goals, such as: (1) rapprochement and dialogue with representatives of the non-Jewish community in order to prevent mutual hostility; (2) gaining respect and appreciation from the social elite of that time; (3) protecting Jewish communities from further persecution.

Thus, the reception of the scientific image of the world at that time, of which the reception of the Copernican model was a significant and symbolic exemplification, took place in the context determined by the triad mentioned above:

tension—aspirations—identity. As mentioned, the tension between religiously oriented communities (Judaism and Christianity) has long been sustained by conflicts and disputes, often turning into mutual hostility and resentment. Tension also arose within the Jewish community in connection with the emerging science and its view of the world that differed from the religious one. Finally, tension also appeared in the minds of individuals within the religious community of Judaism, for whom coming into direct contact with science and its representatives was, on the one hand, fascinating and appealing, and on the other, raised many questions about adherence to the professed religious tradition. On the other hand, aspirations are all those ambitions that propelled representatives of the Jewish community to emerge from the intellectually confined ghetto of their own community. For science became not only something interesting but also gave social prestige, the esteem of the masses, honors from the thrones of rulers and patrons at the same time. And finally, the problem of preserving religious and social identity required defining oneself vis-à-vis own tradition and religious community in light of scientific endeavors undertaken, acceptance of science, and its findings.

1. DAVID GANS: “ECUMENICALITY” OF MODELS OF THE UNIVERSE

The author of the first known named reference to the Copernican model in the works of Jewish thinkers is David Gans.² It is found in his work *Nehmad Vena'im* (1743), which appeared in print for the first time in 1743, although it was written around 1612, shortly before Gans' death.³ In the part of this work, the author praised Copernicus' scholarship and his knowledge of astronomy, while stating that the idea of the heliocentric system had already appeared in antiquity: “Nicolaus Copernicus, a Prussian, was a very learned man, whose fame in astronomy surpassed all his contemporaries. Even today's wise men unanimously admire his sharp intellect and profound understanding of astronomy and have said that there has not been an astronomer like him since the days of Ptolemy. He has delved deeply into this science and, using his sharp intellect, has set his heart on proving that the Earth rotates in a perpetual orbit. This is not, in fact, a novel idea and was known to the ancients over two thousand years ago. For I have found ... that this was the opinion of the renowned and wise Pythagoras and his school.

² More about his life and activities, see NEHER 1986; ALTER 2011, 61-114; PUTÍK, POLAKOVIČ, and ŠULC 2016, 5-63.

³ On this issue, see more: NEHER 1986, 58-77, 87-91; VIŠI 2016, 161-176.

The learned Copernicus wrote his remarkable book about this, the book that is ordered and very, very profound” (GANS 1743, 9a).

The high esteem Gans had for the Polish astronomer probably originated from the Jewish thinker’s general respect for his contemporaries in science. It can be said that he was even fascinated by the representatives of astronomy of that time, whom he personally met in his life. A notable figure for him was Tycho de Brahe, whose scientific work he witnessed by staying several times at the astronomical observatory in Prague and as a guest at the castle of Emperor Rudolf II in Benátky, and also himself, by his kindness, observed the sky, which made a great impression on him. As he acknowledged, he saw “great things” that had not been seen by men before, nor mentioned in any books of both Jewish and Gentile scholars (cf. EFRON 2006, 118–119). These and similar experiences probably caused him to write introductions to astronomy, mathematics, geography, and history, which were addressed to students of Jewish schools and were the equivalent of contemporary school textbooks. He set himself the goal of spreading and popularizing scientific knowledge among the Jewish community, which was a kind of precedent in that community.

At the same time, Gans cultivated the teachings of Jewish rabbis, among whom Moses Isserles (c. 1530–1572) was close to him.⁴ He attended his lectures during his stay in Cracow and his studies at the local rabbinical academy. He even referred to him as his teacher and master who “trained and raised me” (GANS 1743, 8a). Isserles argued that all humans possess natural wisdom, which is a remnant of ancient perfect knowledge lost due to man’s biblical fall. Thus, all knowledge now possessed, including philosophical and scientific knowledge, comes ultimately from the Jews. Therefore, scientific cognition is, as it were, a reflection of that ancient, complete wisdom (cf. ISSERLES 1970, 23–26).

Another crucial figure in the path of Gans’ intellectual growth was the rabbi of Prague, Judah Loew.⁵ Gans came into contact with him during his studies and activities in that city, and it is right to consider the Maharal as his master. Loew was personally not very interested directly in science itself and its achievements, because based on science the difference between Jews and other peoples is impossible to grasp, which means that science blurs that difference.⁶ Neverthe-

⁴ On Isserles’ views on astronomy, see LANGERMANN 1991, 83–98.

⁵ Judah Loew ben Bezalel (known as Maharal; c. 1525–1609), philosopher, kabbalist and mathematician, the chief rabbi of Prague. On his life and views see MAUSKOPF 1949; SHERWIN 1982; PUTIK, ed. 2009, 484–491 where one can find an extensive bibliography on Maharal.

⁶ Maharal demands that scientific knowledge not be placed above religious knowledge or even compared to each other: “Those who come as successors are not equal to those who were formerly and were closer to the Prophets. And today, in our generation, which is characterized by imper-

less, he was in touch with the intellectual circles of 16th-century Prague, also through his patron and protector of scientific research, Rudolf II of Habsburg, with whom he met in person in 1592 and had a long conversation on topics related to natural philosophy, alchemy, and astrology, which the emperor was passionate. It is interesting, however, that while keeping his distance from science, Maharal was at the same time aware of its current findings, as well as of the process of development of scientific cognition as changeable, prone to error, and to some extent contingent. He formed his position in this respect, among others, in the context of the heliocentric theory of Nicolaus Copernicus. When it came to an understanding of the structure of the system of planets, even though Maharal knew about Copernicus and was probably familiar with his heliocentric theory, he was not loath to maintain the geocentric model of the universe rejecting the Polish astronomer's theory. As he noted, Copernicus himself was plagued by doubt and was aware of the difficulties generated by the model proposed (cf. BROWN 2013, 47–49). “The Gentile nations want nothing more than to become wise through this knowledge [astronomy], and indeed they became expert in this field of knowledge, as all know. Yet there always came other experts afterward who overturned the knowledge they had worked so hard to attain. For example, a certain person known as an expert in the New Astronomy has a new description of the universe. As a result, he overturned the understanding that prior astronomers had about the motion of the stars and constellations and the heavenly laws and described an entirely new model, although he admits that there still remain some questions that he cannot resolve.” (LOEW BEN BEZALEL 1969 [1596], 81)⁷

Thus, Loew's attitude toward modern science is characterized by a far-reaching skepticism, in contrast to the perception of knowledge that Jews possess about the world, drawing it from the Torah and the commentaries of many generations of Jewish scholars. Although he did not unequivocally reject the path of scientific cognition, he expressed doubts about the effectiveness of his contemporary scientific research because of the variety of scientific views and the multiplicity of proposed solutions. Thus, Maharal considers scientific cognition variable and uncertain due to constant and endless modifications. “It is not even appropriate to call this entire astronomical endeavor a science. Recognition as science is due only to that which is well understood. Surely you will not find a

fection and foolishness, someone dares to stand up and speak against the saints who lived more than a thousand years ago in this way: ‘Look at my method and become wise!’ In more than one place one takes the help of worldly and idolatrous books and tries to heal the words of our holy scriptures faithful to God, finding them shallow and unstable.” (LOEW BEN BEZALEL 1969 [1598], 3).

⁷ Maharal did not mention Copernicus by name, but it must be presumed that it was Copernican model that he had in mind when he wrote about the new model concerning the cosmos.

single person in their ‘science’ who has grasped the subject matter in all truth, and what is the difference between a big lie and a small one? The truth can never be known in this way ... the wise pagans only know the time of the movement of the Sun, the Moon and the planets, but have no insightful explanation of these phenomena.” (LOEW BEN BEZALEL 1969 [1598], 115). Although science, its particular fields (astronomy, geography, medicine), can be a venue of dialogue and cooperation between representatives of Judaism and other religious-cultural traditions, it is only within limits set by their material object, which for Maharal was, after all, an “inferior coin.” The realm of true wisdom, on the other hand, is rooted in knowledge of a religious (spiritual) nature and will remain within reach of believing Jews, who are the only ones who have had full access to it for centuries.

This peculiar fusion in Gans’ consciousness of the scientific and religious worldview, grounded in his personal experience and the teachings of his masters, resulted in an effort to find a connection between what has been called *historia divina* and *historia naturalis* (cf. EMDEN 2008, 130; FRIEDRICH 2000, 77; 2006, 45). For Gans became convinced that science could prove to be a language of dialogue and understanding between Jews and Christians. Nature itself is, in his view, “ecumenical,” which means that from the scientific perspective, both representatives of Christianity and Judaism can have a correct insight into it. That is why particular fields of scientific knowledge can become a kind of “*lingua franca*” – a common language for Jews and Christians, a tool enabling their intellectual elites to meet. In his opinion, the philosophy of nature and the natural sciences that emerge from it are “ecumenical” because nature is essentially “ecumenical.” For Gans, this was evidenced by the parallels he noticed between rabbinic cosmology and the theories of Tycho de Brahe. He similarly evaluated Kepler’s findings as transcending the differences that existed in the various religious worldviews (cf. BROWN 2013, 55–57). At the same time, he emphasized the great importance of the Jewish provenance of his contemporaries’ astronomical findings, which, in his opinion, go back to the roots of the activity of ancient biblical figures: “Adam was an outstanding astronomer ... and ... when Abraham went down to Egypt because of the famine he taught them astronomy ... and was praised by the Egyptians for his great wisdom ... Abraham passed this knowledge to his son Isaac and grandson Jacob ... The Egyptians were taught ... astronomy by Jacob and his sons when they went to live in Egypt ... The Egyptians taught the Greeks this, and it remained with the Greeks for a long period of time ... until it was discovered by two famous scholars, one of whom was Pythagoras” (GANS 1743, 8a-b). Gans remained aware, however, that in his time, the knowledge of astronomy in the Jewish community was very poor, which is why he postulated to change this state of affairs among the Jewish community and

thus become equal partners in contacts with the intellectual elite of modern Europe: “What shall we say when the Gentiles ask us to explain the intercalation of the calendar and do not find our tradition sufficient? Is it appropriate to cover our mouths with our hands, as if we were mute and unable to communicate? Does this bring us honor? Does this bring our Maker honor?” (ibid., 10a).

On the question of reconciling the models depicting the universe at the time, scientific and religious, Gans did not take a clear position but nevertheless rejected the Judaic position when it was incompatible with scientific observations. When it came to Copernicus’ model and that of his mentor, Tycho de Brahe, he considered them to be equivalent models, which was a common position at the time because of the lack of observational evidence in favor of either. Copernicus’ model is one of the possible models for him, but it still remains only a hypothesis. On the other hand, Brahe’s model is treated by Gans as a compromise from the point of view of seeking to reconcile the scientific and religious picture of the universe. In Gans’ viewpoint, this is an advantage of this model, as it is easier to agree with Judaism and is better suited than Copernicus’ model to justify the correspondence between the claims of astronomy at the time and the teachings of Judaism.⁸ In Brahe’s system, the planets revolve around the Sun, as in Copernicus’ system, but the Sun itself revolves around a stationary Earth. Such a model thus made it possible to explain many astronomical observations while preserving the centrality of the Earth, which was important from a religious perspective.

In addition to the argument in favor of learning about the world through scientific research, Gans argued that the study of astronomy enables a better understanding of God’s omnipotence, leads to the conclusion that there must be a Supreme Cause for the complexity of the universe, and is directly commanded by the Torah, as it is the way to a complete knowledge of God’s designs and works. Thus, one can conclude that for Gans, the scientific enterprise was also an activity of a religious nature, in which respect and worship for its Creator are expressed through learning about nature. For this reason, it seems justified to consider the Prague scholar as a precursor of the theology of science developed today (although on Christian grounds).⁹

⁸“Tycho Brahe changed much of the astronomical tradition of Ptolemy ... He clearly proved that the five planets (Saturn, Jupiter, Mars, Mercury and Venus) do not move in an orbit with the Earth at their focus ... but rather Sun is at the focus of their orbits. And according him, the Sun lies at the center, like a king at the center of his subjects, who causes them to move. ... This was completely unimaginable and beyond the description of the earliest astronomers. ... I have some scrolls in my possession from the noble Tycho Brahe from which any wise students may understand quickly the true underlying explanations of these matters” (ibid., 82b).

⁹ On the theology of science see, e.g., HELLER 1996; EDWARDS 1999; MACEK 2009, 166–172.

Undoubtedly, David Gans' work was an apologist for the defense of Jewish pre-eminence in the history of science development, particularly astronomy. He often tried to show the scientific findings of his contemporaries as confirming the opinions already expressed by Jewish teachers in the past. However, it should be noted that he was also able to refer to them critically in light of current research findings, showing inaccuracies or errors in their reasoning, albeit without diminishing their merits. "All early sages of Israel and the Gentiles thought [that the world is half land and half ocean that surrounds it], including Rabbi Abraham Ibn Ezra and Rabbi David Kimhi ... This was also the opinion of the great astronomer Rabbi Abraham bar Hiyya ... as well as that of the learned Rabbi Israeli ... Yet we have clear evidence which refutes this belief ... and it should not be surprising that in many places the words of our teachers about astronomy and geography are contradictory and difficult to explain, for they often spoke metaphorically or in riddles" (GANS 1743, 25a).

Undoubtedly, Gans' vision of science as a meeting place between Jewish and non-Jewish scholars was a new and bold proposal on the background of previous proposals to preserve the separation between Jewish wisdom and Gentile knowledge. However, it must be emphasized that in his major work (*Nehmad Vena'im*), in the passage on the history of astronomy, Gans separated the history of the Jews from that of other peoples, paralleling them. So he didn't choose to mix and blend them but left them as stories in a way separate. In this compositional procedure, we can see the influence of his master Maharal, whose idea of two stories remained current for Gans, although in a modified form by the latter. In the new version, the two stories meet, but Gans deliberately protects the integrity of each story so as not to destroy any of the stories (cf. RUDERMAN 2001, 84–87).

Indubitably, Gans' openness to the world of developing science and the scientific worldview was derived primarily from his personal contacts with the world of scientific scholars of that time. Practical astronomers opened his eyes to a picture of the universe that Judaic science could not see. His position clearly shows approval of the scientific image, which, however, did not mean a rejection of the claims of the Jewish religion. The Copernican model played an indirect role in this as a fundamental conceptual alternative to the religious model derived from Judaism.

2. JOSEPH SALOMON DELMEDIGO: RECONCILING THEORY AND REALITY

The posthumous lives of David Gans and Joseph Solomon Delmedigo are linked by the fact that both were buried in the same Jewish cemetery in Prague, and their graves are now one of the city's tourist attractions (cf. GREENBLATT 2002, 63). Delmedigo, however, already belonged to the next generation of Jewish scholars, whose intellectual path ran through, for instance, Italian universities.¹⁰ Just as David Gans met Johannes Kepler and Tycho de Brahe in Prague, Joseph Delmedigo had the unique opportunity to meet personally in Padua one of the most outstanding scientists of modern times, Galileo Galilei, while he was making his famous first telescopic observations. "This talented disciple of Galileo was the first Jewish scholar who had a clear grasp of what a tremendous revolution had been effected by the brilliant discoveries of Copernicus and Kepler, not only in the realm of astronomy but in all of man's understanding of the world." (ZINBERG 1974, 158). This important episode in the life of Joseph Delmedigo leads us to assume that he, like other students of Galileo, may have participated to some extent actively (and perhaps even exploratively) in the observations and research conducted by the Italian scientist, especially since he mentions that "we," that is, Galileo's students, "used to look [up into the sky] through the telescopic glass" (BEN-ZAKEN 2010, 191; cf. GULIZIA 2015, 43–52).

Although the mention of Copernicus' model in Gans' work was historically the first, the first printed work by a Jewish thinker in which we find an explicit reference to Copernican cosmology was *Sefer Elim*, by Joseph Delmedigo (cf. NEHER 1977, 211–212). This book was published in 1629 in Amsterdam. References to Copernicus and his model can be found in it in several places.¹¹

Similarly to Gans, Delmedigo was full of admiration for Copernicus and regarded him and Ptolemy as "the two main shining bodies of astronomy." While presenting his model, he, at the same time, tried to explain it vividly and did not hesitate to question Aristotle's views in connection with it. Delmedigo found the Copernicus model to be the best because it is the simplest and accounts for observational difficulties. In his opinion, Copernicus' theory provides a better description of the universe because it explains the observed phenomena better than the models proposed so far. To justify this position, Delmedigo quoted observations of the brightness of planets, the intensity of which, according to the

¹⁰ More on life and activities of Delmedigo can be found in ALTER 1958, 45–71; BARZILAY 1974; Adler, 2013, 141–157; ARBEL 2014, 119–130.

¹¹ For more details about this work see BARZILAY 1974, 95–99.

heliocentric model, depended on the distance of planets from the Sun and their position relative to the Earth. It was a result of his mentioned direct contacts with Galileo. “My teacher Galileo testified that he observed Mars when it lay close to Earth and saw that its light was much greater than that of Jupiter, though its body is smaller. Indeed, its light was so strong that he could not look at it through the telescope and appeared to me elongated, not round ... Thus, if the light of Mars, when in the proximity of Earth, is greater and redder than that of Saturn, which is like lead of dull, and Venus, which is closer to Sun, glitters more than all of them, and Mercury, although the smallest of the planets, is nevertheless bright—we must conclude that they obtain light from Sun, if not all of it, at least the observed increase of it.” (DELMEDIGO 1628–1629, 300–301).

As mentioned before, Delmedigo was a student of Galileo during his studies in Padua. He claimed to have accompanied Galileo in his observations and had the opportunity to see for himself what picture of the universe scientific research provides. This, in turn, led him to the thesis of naturalism: the material unity of the world (no qualitative difference between terrestrial matter and the matter of celestial bodies). The matter with its qualities and properties is the exclusive object of scientific cognition. Whereas in matters where new views have not yet been developed on the basis of scientific discoveries, it is necessary, according to him, to preserve the findings derived from tradition, that is, from religious belief. “You must keep in mind the following principle ... whereas beliefs are considered a virtue to the followers of a religion, it is considered a folly and defect to the philosophers, whose rule is to investigate and to refuse to believe unless compelled ... We shall philosophize in the academies of the nations and in their houses of learning, and for the sake of argumentation we shall call right left; but in the courts of the house of the Lord, we shall believe everything that is written in our Torah” (ibid. 54, 60).

According to Delmedigo, therefore, theses that contradict the findings of empirical science, such as the thesis of the existence of immaterial movers of celestial bodies, should be abandoned.¹² As a consequence, the Jewish thinker clearly separated three areas of human culture within which one can speak of obtaining a specific kind of truth about reality: (1) knowledge derived from experience; (2) convictions resulting from thinking about objects and events; (3) faith based on religious tradition (cf. BARZILAY 1974, 172–175). “Through knowledge we come to know, through thoughts we obtain a conviction, and through faith we can believe.” (DELMEDIGO, 1628–1629, 88).

¹² “We have not seen any intelligence detached, and he who wants to introduce the notion of new beings into the universe must prove their existence” (DELMEDIGO 1628-1629, 38).

Delmedigo firmly accepted Copernicus' model, even though it was not yet generally accepted as correctly describing the movement of the planets around the Sun. Furthermore, he broke the pattern of thinking of astronomy as something only for the purpose of creating a calendar of Jewish religious holidays, in favor of understanding it as the science of what the universe actually is. "Delmedigo not only opened up the world of Galileo and Copernicus to his coreligionists, but also enabled them to study astronomy, mathematics, and machines, and it is not surprising that his work was often cited in later Jewish books of astronomy." (BROWN 2013, 78).

The empirical orientation of cognition, which is typical of the natural sciences, meant for Joseph Delmedigo the subordination of the claims of philosophy of nature and theology to experience, which he regarded as the only source of certainty. All knowledge about the world should be based on data from experience and inferences from the findings of science. For example, Copernicus' theory provides a better description of the universe because it explains better the observed phenomena (the observations mentioned above of the brightness of the planets, the intensity of which—according to the heliocentric model—depended on the distance of the planets from the Sun and their position in relation to the Earth). Moreover, he drew attention to the mistakes of the Polish astronomer's predecessors (Aristotle and Ptolemy), who, according to Delmedigo, did not attach sufficient importance to precise observations of the sky. "We want nothing to do with those who turn a blind eye and prefer only to follow others as if those others were announcers of the words of God Himself. Such a person is far from being considered a true philosopher." (DELMEDIGO 1628–1629, 151). This is because observations point to the material unity of the world and the lack of a qualitative difference between terrestrial matter and the matter of celestial bodies.

Such a radically formulated thesis of epistemological and methodological naturalism consequently led Delmedigo to the conviction that only a relationship with empiricism offers Jewish thought a chance for continuous progress adequate to the development of the sciences. That is why he could not accept the narrow-mindedness and conservatism of the Jewish community in Amsterdam, where his most important work (*Sefer Elim*) was published in a censored version (cf. SWETSCHINSKI 2004, 264). Delmedigo challenged both Aristotelian rationalism and Kabbalistic irrationalism from a position of empiricism. He maintained that reality should not be distorted to fit Aristotle's theory, but the theory should agree with observed facts. "You must realize that Aristotle was only human and not divine. You must not, therefore, always rely on him uncritically." (DELMEDIGO 1628–1629, 433). In turn, an example of the distance with which he treated all

“miracles” and “unusual things” is the skeptical position he took during his stay in Poland in relation to the case of the “wonder child” from Gródek, later revealing the fraud that accompanied it (cf. RUDERMAN 1979, 143–163). Even the realm of human faith, as based on tradition, should be grounded in historical testimony having the status of a kind of “empirical proof.”

The fact remains that Joseph Delmedigo was widely accepted and appreciated as a natural scientist not only in the intellectual circles of Christian Europe¹³ but also by Jewish communities, for two reasons: his achievements as a natural philosopher, mathematician, and physician and his reputation and recognition at European courts. It can even be said that Delmedigo was a source of pride and honor for a large part of the Jewish community, and his work was associated with the hope of overcoming resentment against the Jews, as can be seen in the words found in the introduction to *Sefer Elim* by Simone Luzzatto, the widely respected rabbi of Venice: “My heart rejoices and my mind gloats over that wonderful knowledge; the mouths of those who look down upon us – saying that we lack science and wit – shall be sealed. Today, Greek and Roman scholars shall say: ‘So they have the same minds like us and have shown their true worth.’ This text ought to be translated because it would bring us prestige. I pray to God in His dwelling-place that the author may be acknowledged and praised and that the knowledge of God spreads over the Earth!”¹⁴

CONCLUSION: THE RECEPTIONS AND THE STRATEGIES

For the above-mentioned representatives of Jewish thought, the emerging scientific natural science, apart from its undoubtedly cognitive value, also had a pragmatic dimension. The pragmatic approach to learning was expressed in: (1) striving to break the isolation of the Jewish community by opening it up to knowledge in the field of sciences; (2) aiming to achieve prominence, respect, and recognition in European intellectual communities; (3) seeking support and patronage from the representatives of the authorities of that time in connection with the scientific activities carried out and their practical effects. The aim was to

¹³ He enjoyed a close friendship with, among others, the Polish scholar and clergyman Jan Brozek (1585-1652). In the context of Delmedigo’s constant scholarly travels between the centers of knowledge of the time, he appears to have been a “Daedalian” artisan rather than a Jew from the Diaspora. Cf. ADLER 1997, 293-299.

¹⁴ Cited from GUETTA 2014, 246, footnote 26.

resolve conflicts between the Jewish and Christian communities. This goal seemed challenging to achieve from the beginning because of the fundamental distance of the representatives of Judaism from the emerging modern natural sciences, in which the community of Christian scholars was involved. Moreover, the activities of Jewish scholars were invariably accompanied by the entanglement of their philosophy of nature and natural science in the religious image of the world (present in Judaism) and the related struggle to maintain religious and cultural identity. And finally, the encounter with Christian thinkers and the emerging scientific worldview gave rise to a conflict that was even different from that concerning complex interactions with non-Jews or within the Jewish community between “progressives” and “traditionalists.” It is a conflict of the most internal kind, taking place in the conscience of an individual researcher and forcing him to stand for or in some sense against his own tradition. An authentic and dramatic illustration of this state of affairs is the memoirs recorded by another representative of Jewish physiologists and physicians at the turn of the 16th and 17th centuries, Abraham Portaleone: “When God wanted to chasten me, I fell ill. Two years ago the whole left side of my body became as if dead, and I could no longer touch my hand to my breast nor walk in the street, even leaning on a cane, because of the loss of feeling and the ability to move my limbs. I searched my behavior and saw (after Him who sees all) that in addition to my sins, which were more numerous than the hairs on my head, the clamor of my neglecting the Torah had risen before the face of God. For I had dealings with the children of Greek wisdom, I sought to reach the heights through philosophy and medicine, which lured me with their honeyed words to seek salvation in the ways of darkness, and thus prevented me from devoting myself to the heritage of the community of Jacob, as I should have done. This is why God was angered against me, dire maladies have darkened my days and defeated me; my nerves are ruined, my sighs do not cease, so that with the bitterness of my soul, sleep has left me and I cannot recover my strength. Happiness has fled and pain increased.” (*Shiltey ha-Gibborym*, f. 2v).¹⁵ Finally, at the very end of his life, Portaleone “converted” and abandoned further scientific activity, following the voice of his conscience. In this case, his encounter with science and the internal conflict revealed in that encounter turned out to be a reason for rejecting an intellectual fascination with the world that opposed the Torah, which for scholars like Gans and Delmedigo would have meant squandering the chance to realize the ideal of the Jewish community co-creating the scientific climate of modern Europe. However, their different choice does not mean that they were completely free from this internal conflict.

¹⁵ As quoted in GUETTA 2014, 33.

The first two receptions of the Copernican model by Jewish thinkers at the turn of the 16th and 17th centuries and their contexts provide grounds for concluding that they are adequate exemplifications of a broader issue. It is about the strategy of Jewish thinkers to deal with the problem of the scientific image of the world as an alternative to the religious image derived from the biblical content. Gans and Delmedigo applied different strategies in this regard, although they had essentially the same goal: to make the two images harmonize with each other.

Gans' strategy was that in a situation of incompatibility between the scientific and religious images of nature, a scientific theory should be sought that, on the one hand, explains the observed phenomena and, on the other hand, satisfies the religious claims. Finding such a theory not only solves the problem of the aforementioned incompatibility of images of the world but, moreover, additionally gives credence to this theory from a religious point of view and provides an argument for its correctness.

Delmedigo, on the other hand, postulated refraining from striving for a direct, immediate, and unequivocal agreement between the two images of the world while recognizing a properly justified scientific theory as correctly describing and explaining the phenomena occurring in nature. As a consequence, the apparent incompatibility between the scientific and religious worldviews demands a reformulation of religious statements in such a way as to remove this incompatibility, or a limitation of the meaning of religious statements to the strictly religious and moral sphere, without the ambition to speak about nature.

In both of the positions presented, one can see a more profound, continuing tendency to reduce the religious image of nature in favor of a scientific one. Extending the perspective on this issue and including both the predecessor of the two thinkers in question, Maharal, and their successor, Baruch Spinoza, we can conclude that the reception of the scientific picture of the world, exemplified by the reception of the Copernican model, proceeded as follows: from maintaining a firm distance from science and its findings (Maharal), through seeking to reconcile scientific and religious imagery (Gans, Delmedigo), to firmly rejecting religious imagery in favor of scientific (Spinoza) (BROWN 203, 78–79; cf. LEVY 1987, 187).

This situation had further consequences for the attitude of Jewish religious thought toward natural sciences. Indeed, for some representatives of Judaism, there was a far-reaching distancing from science and its findings, while for others, the result of approving the scientific image was a turning away from Judaism. This testifies to the fundamental difficulty that Judaism had (and probably still has) (cf. GOLDBERG 2000) in obtaining such a picture of the world which,

on the one hand, will take into account the consequences of the development of natural sciences, and on the other hand, will preserve the religious understanding of reality, drawn from the sources of the biblical tradition.

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THE RECEPTION OF THE COPERNICAN UNIVERSE
 BY REPRESENTATIVES OF 17TH-CENTURY JEWISH PHILOSOPHY
 AND THEIR SEARCH FOR HARMONY BETWEEN THE SCIENTIFIC
 AND RELIGIOUS IMAGES OF THE WORLD
 (DAVID GANS AND JOSEPH SOLOMON DELMEDIGO)

S u m m a r y

The reception of the heliocentric theory of Nicolaus Copernicus in Jewish thought of the 17th-century period is a good exemplification of the issue concerning the formation of the relationship between natural science and theology, or more broadly: between science and religion. The fundamental question concerning this relationship, which we can ask from today's perspective of this problem, is: How does it happen that claims of a scientific nature, which are initially considered from a religious point of view to be incompatible with the religious view of the world, are later accepted as possible to agree with this image of reality and are assimilated by a given religion? Based on the reception of the Copernican image of the universe by two representatives of Jewish philosophy in the 17th century—David Gans and Joseph Solomon Delmedigo—it is possible to trace this process and pose the thesis that it takes place according to two strategies. Within the framework of the first one, represented by Gans, in a situation of incompatibility between the scientific and religious images of nature, a scientific theory is sought that explains the observed phenomena and, on the other hand, satisfies the religious claims. Finding such a theory solves the problem of the incompatibility mentioned above of images of the world, gives the theory credibility from the religious point of view and constitutes an argument for its correctness. The second strategy, represented by Delmedigo, consists in refraining from pursuing a direct, immediate, and unequivocal reconciliation of the two images of the world while at the same time recognizing a properly justified scientific theory as correctly describing and explaining the phenomena occurring in nature. Consequently, the apparent incompatibility between the scientific and the religious worldview demands either a reformulation of religious statements in such a way as to remove this incompatibility or the restriction of the meaning of religious statements to the strictly religious and moral sphere, without the ambition to speak about nature. In either case, however, it is already a task for the representatives of the religion concerned who, when confronted with adequately justified scientific claims, to avoid exposing their religion to the accusation that its claims are unreasonable and anachronistic, undertake the task mentioned above of modifying or limiting the scope of their statements. It seems that in the representatives of Jewish thought and Judaism, who are the successors of Gans and Delmedigo, generally speaking, the second strategy has prevailed in this version, in which one abandons the claim of religion to statements about the material world at the price of a significant divergence of the paths of science and religion. Consequently, it treats them as different narratives, describing and explaining two separate spheres of reality.

Keywords: Copernican Universe; David Gans; Joseph Solomon Delmedigo; scientific and religious worldview

RECEPCJA WSZECHŚWIATA KOPERNIKAŃSKIEGO
PRZEZ PRZEDSTAWICIELI XVII-WIECZNEJ FILOZOFII ŻYDOWSKIEJ
I ICH POSZUKIWANIE HARMONII
MIĘDZY NAUKOWYM I RELIGIJNYM OBRAZEM ŚWIATA
(DAVID GANS I JOSEPH SOLOMON DELMEDIGO)

Streszczenie

Recepcja heliocentrycznej teorii Mikołaja Kopernika w myśli żydowskiej okresu XVII wieku stanowi dobrą egzemplifikację zagadnienia dotyczącego kształtowania się relacji między naukami przyrodniczymi i teologią lub – szerzej – między nauką i religią. Zasadnicze pytanie dotyczące tej relacji, które można postawić z dzisiejszego punktu widzenia tego problemu, brzmi: Jak to się dzieje, że twierdzenia o charakterze naukowym, które początkowo są uznawane z perspektywy religijnej za niezgodne z religijnym obrazem świata, zostają następnie przyjęte za możliwe do uzgodnienia z tym obrazem rzeczywistości i zasymilowane przez daną religię? Na podstawie recepcji Kopernikańskiego obrazu wszechświata u dwóch przedstawicieli filozofii żydowskiej XVII wieku – Dawida Gansa i Józefa Salomona Delmedigo – można ten proces prześledzić i postawić tezę, że dokonuje się on zgodnie z dwiema strategiami. W ramach pierwszej, reprezentowanej przez Gansa, w sytuacji pojawienia się niezgodności między naukowym i religijnym obrazem przyrody poszukuje się takiej teorii naukowej, która z jednej strony wyjaśnia obserwowane zjawiska, a z drugiej czyni zadość twierdzeniom religijnym. Znalezienie takiej teorii nie tylko rozwiązuje problem wspomnianej niezgodności obrazów świata, ale ponadto dodatkowo uwiarygadnia tę teorię z punktu widzenia religijnego i stanowi argument na rzecz jej poprawności. Druga strategia, reprezentowana przez Delmedigo, polega na powstrzymaniu się od dążenia do bezpośredniego, natychmiastowego i jednoznacznego uzgodnienia obu obrazów świata przy jednoczesnym uznaniu odpowiednio uzasadnionej teorii naukowej za prawidłowo opisującą i wyjaśniającą zjawiska zachodzące w przyrodzie. W konsekwencji ujawniająca się niezgodność między naukowym i religijnym obrazem świata domaga się takiego przeformułowania twierdzeń religijnych, aby ową niezgodność usunąć, albo ograniczenia znaczenia twierdzeń religijnych tylko do sfery ściśle religijno-moralnej, bez ambicji wypowiedzania się o przyrodzie. W jednym i w drugim przypadku jest to już jednak zadanie dla przedstawicieli danej religii, którzy postawieni wobec odpowiednio uzasadnionych twierdzeń naukowych, chcąc uniknąć wystawienia swojej religii na zarzut braku racjonalności i anachroniczności jej twierdzeń, podejmują wspomniane zadanie modyfikacji lub ograniczenia zakresu swoich wypowiedzi. Wydaje się, że u przedstawicieli myśli żydowskiej i judaizmu, będących następcami Gansa i Delmedigo, mówiąc ogólnie, zwyciężyła strategia druga w tej wersji, w której porzuca się roszczenie religii do wypowiedzi o świecie materialnym za cenę istotnego rozejścia się dróg nauki i religii i w konsekwencji potraktowania ich jako odmiennych narracji, opisujących i wyjaśniających dwie różne sfery rzeczywistości.

Słowa kluczowe: model kopernikański; Dawid Gans; Józef Solomon Delmedigo; naukowy i religijny obraz świata

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