CROATIAN LANDS IN LATE MEDIEVAL AND EARLY RENAISSANCE ASTROLOGICAL PREDICTIONS AND ASTRONOMICAL STUDIES. EXAMPLES FROM CENTRAL EUROPEAN SOURCES[1]

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This paper analyzes instances in which Croatian lands – primarily Croatia, Dalmatia and Slavonia – were mentioned in late Medieval and early Renaissance astrological studies, mostly those published during Marko Marulić's lifetime. These studies originate in Central European scholarly circles, above all those centered on the universities of Vienna and Cracow. The first part of the paper examines whether contemporary astronomers knew of the existence and geographic position of Croatian lands, a prerequisite for the making of astrological predictions. The second part examines the astrological predictions themselves. The texts studied here are contained within manuscripts and prints that circulated in the period and were available to a wider public. It is also explained how astrological predictions were socially relevant in the studied period and how a study of them can help readers understand contemporary mindsets.

Keywords: astronomy, astrology, geography, Renaissance, Croatian history

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1. Introduction

Studying the Renaissance often includes understanding and analyzing concepts which seem strange or offensive to the modern-day mentality. One of those concepts is the whole field of astrology, which has in the meantime been rightly branded as a pseudo-science. Nevertheless, the contemporaries did not perceive Renaissance astrology as irrelevant or foolish, but as a significant factor of daily life. Therefore it can often be useful to mine astrological texts for information, as they are a valuable source of contemporary knowledge about the workings of the world and a mirror of their composers' and consumers' hopes and fears as well as of their general mindset.

In this paper we will examine whether there is information to be found about Croatian lands – under the names Croatia, Slavonia, Dalmatia and Istria – in Renaissance astrological texts. In honor of Marko Marulić, the timeframe of our analysis will be roughly the time in which he lived and created, the second half of the 15th and the first quarter of the 16th century. The texts will originate from contemporary Central European astronomers, primarily from the circles of the universities of Vienna and Cracow. The texts considered here will consist primarily of astrological data written and published for a wider audience, such as *practicae*, *ephemerides* (texts containing sets of coordinates of celestial bodies and other information necessary for casting astrological predictions) and introductions to astrology. It is possible that some of them reached Marko Marulić.

In this analysis we will focus on the knowledge contemporary astrologers had about Croatian lands, such as their existence, geographic position and history, and of the predictions they made regarding them. The first component could reveal whether knowledge about these lands figured in contemporary astronomic reckonings, as geography was intrinsically related to astronomy, and astronomy was a prerequisite of any astrological prognostications. The second component could indicate whether contemporary astrologers, who were often politically important factors and influenced public opinion, knew the political and other current issues concerning Croatian lands. Both components would help identify the place Croatian lands possessed in the Renaissance worldview and system of knowledge. We will list several examples of instances in which Croatian lands came into the focus of the works of late medieval astronomers and astrologers. By doing so, we will attempt to determine how they identified Croatian lands, and what the reasons for their attention were.

Before beginning our analysis, it should be stated that only selected examples will be studied here. Therefore, the result will not be a complete image of how Croatian lands were represented in Renaissance astrology, but rather a sketch of the general situation and an indication of the directions future studies could take. Also, although astrological predictions studied here were ungrounded and unreliable regarding information about the future, they are able to inform us about the

past. They can fill in the gaps in understanding the mindset in which Renaissance authors, including literary writers, created; this can help researchers interpret their texts. It should not be forgotten that contemporaries of the Renaissance had their own idea of the truth, which differed from ours.

2. Late Medieval and Renaissance Astronomy / Astrology and its Knowledge of Croatian Lands

In the 15th century, astronomical studies advanced by leaps and bounds. Renaissance humanism brought a renewed interest in ancient Greek and Latin astronomical texts; the increased traffic of books between Constantinople and the European West introduced the original works of Claudius Ptolemy and his successors to European universities.[2] Algebra, which is indispensable for astronomical calculations, was studied and expanded, and its language began to resemble something we would recognize today.[3] Nevertheless, it would be grossly anachronistic to think that these developments were underpinned by something resembling modern-day rationalism. Advances in astronomy were powered by the desire to predict the future by the means of what we would today call astrology. None of the late medieval astronomers doubted that it was possible to do so, and the only dissent came from those who thought that predicting the future was beyond human capabilities. For example, Nicole Oresme (d. 1382) and Heinrich of Langenstein (d. 1397) denied the scientific validity of astrological prognostication not because they denied the influence of celestial bodies on events taking place on the Earth,

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[2] Basil Bessarion, an ethnic Greek and a cardinal of the Roman Church, initiated the effort to produce an updated interpretation of Ptolemy's astronomical theories, as presented in the *Almagest* in the original Greek, resulting in a great controversy between contemporary astronomers. See Michael H. Shank, »Regiomontanus and Astronomical Controversy in the Background of Copernicus«, in: *Before Copernicus: The Cultures and Contexts of Scientific Learning in the Fifteenth Century*, eds. Rivka Feldhay and F. Jamil Ragep, McGill – Queen's University Press, Montreal, 2017, 79–109, at 89–98; Michael H. Shank, »The *Almagest*, Politics, and Apocalypticism in the Conflict between George of Trebizond and Cardinal Bessarion«, *Almagest – International Journal for the History of Scientific Ideas* 8, No. 2 (2017), 49–83. It is also notable that six books of the *Arithmetica* by Diophantus of Alexandria were discovered in Venice in 1463 /1464. See Helmuth Grössing, »Regiomontanus und Italien. Zur Problem der Wissenschaftsauffassung des Humanismus«, in: *Regiomontanus-Studien*, ed. Günther Hamann, Österreichische Akademie der Wissenschaften, Vienna, 1980, 223–42, at 230.

[3] The first uses of the symbols x and x^2 come from the 1460s; see Menso Folkerts, »Die Mathematischen Studien Regiomontans in seiner wiener Zeit«, in *Regiomontanus-Studien*, ed. Günther Hamann, Österreichische Akademie der Wissenschaften, Vienna, 1980, 175–209, at 197–198.

but because they thought humans lacked the ability to understand or interpret it.[4] Astrology was therefore intrinsically tied to astronomy and the question of prognostication was not primarily one of science-versus-magic, but one of scientific methods.[5] Late medieval and early modern Europe was also susceptible to various other, less science-adjacent forms of prognostication, such as visions and prophecies, with which astrology was often intermingled.[6]

In the 14th century, Parisian scholars were the main sources of authority on astronomical matters. In Paris, the Alfonsine Tables, made in Castile in the 13th century, were extensively studied and elaborated. The work done there by astronomers such as Jean de Lignères, Johannes of Saxony and others would remain the cornerstone of astronomy for centuries to come.[7] However, in the following century centers of the study of astronomy shifted towards the East. In the 15th century, the University of Vienna became the center of new astronomical learning, with its first school of astronomy being founded by Heinrich of Langenstein, who

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[4] Laura Ackerman Smoller, *History, Prophecy and the Stars. The Christian Astrology of Pierre d'Ailly, 1350–1420*, Princeton University Press, Princeton, 1994, 32–36.

[5] As an introduction to this question, see Richard Lemay, »The True Place of Astrology in Medieval Science and Philosophy: Towards a Definition«, in: *Astrology, Science and Society. Historical Essays*, ed. Patrick Curry, The Boydell Press, Woodbridge – Wolfeboro, New Hampshire, 1987, 57–73, and John D. North, *Horoscopes and History*, The Warburg Institute – University of London, London, 1986.

[6] See Jonathan Green, *Printing and Prophecy: Prognostication and Media Change 1450–1550*, University of Michigan Press, Ann Arbor, 2011; Laura Ackerman Smoller, »Teste Albumasare cum Sibylla: Astrology and the Sibyls in Medieval Europe«, *Studies in History and Philosophy of Biological and Biomedical Sciences* 41, No. 2 (2010), 76–89.

[7] José Chabás and Marie-Madeleine Saby, *The Tables of 1322 by John of Lignères. An Edition with Commentary*, Brepols, Turnhout, 2022, 9–29; José Chabás and Bernard R. Goldstein, *The Alfonsine Tables of Toledo*, Kluwer Academic Publishers, Dordrecht – Boston – London, 2003, 243–294; Emmanuel Poulle, ed. and trans., *Les tables alphonsines avec les canons de Jean de Saxe*, Éditions du Centre national de la recherche scientifique, Paris, 1984, 3–28.

was trained in Paris.[8] In the second half of that century, the University of Cracow gained ascendancy.[9] It was the latter that ultimately produced Copernicus.

Before dealing with the predictions themselves, we will first examine whether medieval and Renaissance astronomers were aware of the geographical position of Croatia and the difficulties this posed. It is important to note that astrological predictions proliferated, especially with the advent of the printing press, and that they had a considerable role in current politics and policymaking.[10] However, they were not straightforward to make. Although it was fundamentally wrong, geocentric astronomy was by no means simple. A Renaissance astrologer was, first and foremost, a scientist, and his work was based on figures. To be able to make predictions, he had to calculate the position of the celestial bodies over a certain location on Earth, the time and duration of an eclipse, or the trajectory of a comet. To do so, he had the aid of astronomical tables.[11] However, these tables

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[8] Helmuth Grössing, »Johannes von Gmunden, ein Lehrer der Georg von Peuerbach«, in: *Der die Sterne liebte. Georg von Peuerbach und seine Zeit*, ed. Helmuth Grössing, Erasmus, Vienna, 2002, 77–88 at 82–83; Beatriz Porres de Mateo, »Die astronomischen Tafeln des Johannes von Gmunden: Seine Lehre und Forschung an und außerhalb der Universität Wien«, in: *Johannes von Gmunden (ca. 1384–1442). Astronom und Mathematiker*, eds. Rudolf Simek and Kathrin Chlench, Fassbaender, Vienna, 2006, 105–126 at 110–111; Michael H. Shank, »Academic Consulting in Fifteenth-Century Vienna: The Case of Astrology«, in: *Texts and Contexts in Ancient and Medieval Science – Studies on the Occasion of John. E. Murdoch's Seventieth Birthday*, eds. Edith Sylla and Michael McVaugh, Brill, Leiden, 1997, 245–70, at 249–250. For an overview of Heinrich of Langenstein's career, see Joseph Aschbach, *Geschichte der Wiener Universität im ersten Jahrhunderte ihres Bestehens*, Vienna, 1865, 366–402.

[9] Edith Dudley Sylla, »The Status of Astronomy as a Science in Fifteenth-Century Cracow. Ibn al-Haytham, Peurbach, and Copernicus«, in *Before Copernicus: The Cultures and Contexts of Scientific Learning in the Fifteenth Century*, eds. Rivka Feldhay and F. Jamil Ragep, McGill – Queen's University Press, Montreal, 2017, 45–78. For the University of Cracow in the Middle Ages, see Paul W. Knoll, *»A Pearl of Powerful Learning«: The University of Cracow in the Fifteenth Century*, Brill, Boston – Leiden, 2016.

[10] For examples of the role of astrology in late medieval royal courts, see Michael A. Ryan, *A Kingdom of Stargazers. Astrology and Authority in the Late Medieval Crown of Aragon*, Cornell University Press, Ithaca – London, 2011; Hilary M. Carey, *Courting Disaster. Astrology at the English Court and University in the Later Middle Ages*, St. Martin's Press, New York, 1992; Darin Hayton, *The Crown and the Cosmos. Astrology and the Politics of Maximilian I*, University of Pittsburgh Press, Pittsburgh, 2015; Monica Azzolini, »Reading Health in the Stars. Politics and Medical Astrology in Renaissance Milan«, in: *Horoscopes and Public Spheres. Essays on the History of Astrology*, eds. Günther Oestman, H. Darrel Rutkin and Kocku von Stuckrad, Walter de Gruyter, Berlin – New York, 2005, 183–205.

[11] For example, calculating the time of true syzygy based on the time of mean syzygy was a complex matter; see José Chabás and Bernard R. Goldstein, »Computational

were usually attuned to one location, and the user had to adapt the values to the location of his interest. This problem was compounded by the fact that determining the exact coordinates of geographical locations was virtually impossible. In pre-telescope times this could be done, although roughly, by observing eclipses, but it seems that astronomers very often relied on approximations of distances between places.[12] Marginalia in astronomical manuscripts often reflect the difficulties and, perhaps, frustration encountered by their users. For example, there is a manuscript to which a reader added a remark proclaiming that the values within would be »good enough« for Cologne (*est satis pro Colonia*),[13] and in another manuscript another reader angrily pointed out the imprecise longitude used in calculations.[14] Sometimes the users added their own modifications to given values. For example, a reader explained in a note how a table calculated for Vienna could be reworked for the coordinates of Heidelberg.[15]

It was not uncommon for astronomical texts to contain a table with the coordinates of important cities such as Paris, Rome or Vienna, and sometimes readers added the coordinates of their own places of interest to the ones given in a manuscript. It is notable that the readers' additions were, within the limitations of system in which they operated, surprisingly accurate.[16] Croatian cities sometimes featured in these additions. In Codex 2288 of the Österreichische Nationalbibliothek in Vienna, which contains a set of Alfonsine Tables, a number of readers added the values of variables for several European cities, and at least two of them inserted the values for Dubrovnik (Ragusa). One, writing in black ink, added the time differences between Dubrovnik and Toledo, Dubrovnik and Padua, and

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Astronomy. Five Centuries of Finding True Syzygy«, *Journal for the History of Astronomy* 28 (1997), 93–105, and José Chabás and Bernard R. Goldstein, »The Medieval Moon in a Matrix: Double Argument Tables for Lunar Motion«, *Archive for History of Exact Sciences* 73 (2019), 335–59. This was just one of the steps necessary for determining the time of an eclipse. Regarding this matter, see also Clemency Montelle, *Chasing Shadows. Mathematics, Astronomy, and the Early History of Eclipse Reckoning*, The Johns Hopkins University Press, Baltimore, 2011, 22–41. Using the results of these methods for astrological prognostication required specialized knowledge and skill. For a short description of late medieval medico-astrological techniques, see Monica Azzolini, *The Duke and the Stars. Astrology and Politics in Renaissance Milan*, Harvard University Press, Harvard – London, 2013, 53–64.

[12] Richard L. Kremer and Jerzy Dobrzycki, »Alphonsine Meridians: Tradition versus Experience in Astronomical Practice c. 1500«, *Journal for the History of Astronomy* 29 (1998), 1–23.

[13] Germany, Erfurt, Universitätsbibliothek Erfurt, Dep. Erf., CA 4° 366, fol. 55v.

[14] Germany, Gotha, Forschungsbibliothek Gotha, Chart. A 868, fol. 9r.

[15] Vatican City, Biblioteca Apostolica Vaticana, Pal. Lat. 1375, fol. 56r.

[16] R. L. Kremer and J. Dobrzycki, *o. c.* (12), 189–191.

Dubrovnik and Rome.[17] The other, writing in both red and black (categories in red, values in black), added the radices for calculating the motions of various celestial objects above Dubrovnik. They are scattered throughout the manuscript and can be found at the top left of the page, above the tables.[18]

As these entries were not part of the original manuscript, it can be assumed that customizing its contents was important to at least two readers, who were presumably either from Dubrovnik or had a special interest in it. However, there were also lists of geographical locations which already contained the coordinates of that city. The influential table of Reinhard of Kloster Reichenbach, which originated in the first half of the 15th century, included the coordinates of Dubrovnik. This was an attempt to update the old Ptolemaic list of coordinates and it testifies to the importance Dubrovnik had at the time when Reinhard's table was compiled. The city appears in the expanded version of the table, the so-called Table B. In it the cities are grouped by regions and Dubrovnik is the only place listed in the group under the heading »Dalmatia«.[19]

Dubrovnik was not the only Croatian city to appear in lists of coordinates. One of the first printed editions of the Alfonsine Tables, published in Venice in 1492 by Augustine of Olomouc and Johannes Santritter, contains in its additions to the original tables the coordinates of Senj (but not of Dubrovnik). These are listed in a table of geographic longitudes titled *Tabula regionum, prouinciarum ac civitatum insigniorum Europe* (Table of notable European regions, provinces and cities) with a note that values given there can be used for nearby places as well, as the difference would be so small as to be negligible.[20] Senj was the principal port of the Kingdom of Hungary-Croatia at the time and it is therefore understandable that it was deemed important enough to be included.[21]

In the 16th century, printed editions of astrological works featured Croatian towns more often; for example, in a 1518 edition of an introduction to astrology by Andreas Perlach and Georg Tannstetter, which was intended for laymen, on a list of »distinguished Christian cities« we see both Senj and Zagreb. The purpose of this list was to provide the reader with the tools to transfer the values given for

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[17] Vienna, Österreichische Nationalbibliothek (in further text: ÖNB), Cod. 2288, fol. 5v.

[18] For example, Vienna, ÖNB, Cod. 2288, fol. 10v, 11v, 12v, etc.

[19] Dana Bennett Durand, *The Vienna – Klosterneuburg Map Corpus of the Fifteenth Century. A Study in the Transition from Medieval to Modern Science*, Brill, Leiden, 1952, 361. On Reinhard's Table B, see ibid, 139–144.

[20] *Tabule astronomice Alfonsi regis*, eds. Augustine of Olomouc and Johannes Santritter, Venice, 1492, fol. 34r.

[21] Borislav Grgin, »Senj i Vinodol između kralja Matijaša Korvina, Frankapana i Venecije (1465–1471)« [Senj and Vinodol between King Matthias Corvinus, the Frankapans and Venice (1465–1471)], *Radovi Zavoda za hrvatsku povijest Filozofskoga fakulteta Sveučilišta u Zagrebu* 28, No. 1 (1995), 62–63.

lunar motions above the Vienna meridian to the meridians of other »distinguished cities«, since the author, Andreas Perlach, claimed that readers would want to use his book in those locations as well. The same procedure was given for calculating the altitude (elevation) of the celestial pole over the horizon.[22] The same Croatian locations (*Segnia* and *Sagrabia*) appear in Perlach's *Ephemerides* for the year 1529, dedicated to King Ferdinand of Bohemia and Hungary-Croatia.[23]

Geography was closely tied to astronomy in the pre-modern era because geographical relations could only be determined by astronomical observations, as we have mentioned previously. In his *Epitome trium terrae partium*, published in 1534, Joachim Vadianus, who was also a member of the Viennese circle of astronomers,[24] described Croatia as a part of Pannonia bordering on Illyria and Liburnia (*pars Pannoniarum… quam Croaciam vulgo nominant, in Illyricum et Lyburnos imminens*). According to Vadianus, the churches and bishops there used the Holy Scripture translated into their own letters and language. Vadianus wrote that this was similar to the Turkish script, but that its users claimed that it was of Dalmatian origin. He also dolefully asserted that Croatia was being devastated by the Ottoman incursions, and that Christian princes were doing nothing to help its defense. According to him, this was one of the great misfortunes of his time.[25] This goes to show that contemporary men of letters were familiar with the situation in and around Croatia, which Marko Marulić experienced firsthand, as his *Molitva suprotiva Turkom* and letter to Pope Adrian VI attest. Vadianus treated Dalmatia in a separate, but rather short chapter, and lumped Illyria, Liburnia and Istria together in a single chapter. There he displayed a similar understanding of the contemporary political situation, stressing that Dalmatia was in his time mostly subject to Venice, and that it was the farthest area in the Balkans where the Christian faith was practiced inviolably. To him, Dalmatia was the area south of the river Krka, north of which lay Illyria or, more precisely, Liburnia. For Vadianus, Illyria was a catch-all term for the Adriatic coastline between the Krka and Trieste, which included Liburnia and Istria, but also large parts of the hinterland. He explained that in his time the area was inhabited by Slavs, which he distinguished from

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[22] Georg Tannstetter Collimitius and Andreas Perlach, *Usus Almanach seu Ephemeridum*, Vienna, 1518, fol. 3r. This was one of Perlach's early works and he claimed that it was based on the work of his teacher, Georg Tannstetter; see D. Hayton, *o. c.* (10), 146–152. Both men were professors of the University of Vienna. Regarding Georg Tannstetter, see Franz Graf-Stuhlhofer, *Humanismus zwischen Hof und Universität. Georg Tannstetter (Collimitius) und sein wissenschaftliches Umfeld im Wien des frühen 16. Jahrhunderts*, WUV Universitätsverlag, Vienna, 1996.

[23] Andreas Perlach, *Ephemerides Andree Perlachii Stiri ex Witscheyn… pro Anno domini & Salvatoris nostri Iesu Christi MDXXIX*, Vienna, 1528, fol. 2r. Regarding these *ephemerides*, see D. Hayton, *o. c.* (10), 161–165.

[24] D. Hayton, *o. c.* (10), 79–80.

[25] Joachim von Watt Vadianus, *Epitome trium terrae partium*, Zürich, 1534, 35.

Croats. He noted that there, similarly to Croatia, the »Dalmatian« language was used in liturgy.[26]

3. Putting the Knowledge to Use – Astrological Predictions Concerning Croatian Lands

We have so far determined that late medieval and early modern astronomers were aware of the general position of Croatian lands, and that at least some of the readers of astronomical works were eager to determine the values necessary for astronomical calculations for certain localities in those lands, especially Dubrovnik. Let us now see how the data obtained by these calculations were treated in astrological works.

First, it should be said that astrological prognostications, based on the calculations of the motions of celestial objects, were used for a variety of purposes, but among the most important ones were political decisions. A capable astrologer was a valuable adviser to any ruler.[27] A glimpse into the future, however narrow, could make all the difference when making an important decision. Astrological prognostications were sought-after merchandise, and rulers would sometimes seek to suppress those unfavorable to them.[28] An unfavorable prognostication could also cause severe distress among the populace. Leaflets containing predictions of the catastrophes that would supposedly be caused by celestial events circulated widely and sometimes had to be countered by prestigious astronomers.[29]

When composing his analysis of a celestial event and the influence it would have on events on Earth, an astrologer would first explain the methods he employed. This usually included a description of the celestial event and citing several authorities for its interpretation, most commonly medieval Muslim authors such as Abu Ma'shar (Latinized as Albumasar). After that would follow general statements describing the effects of the event, and in the end the author's predictions regarding particular matters. All of the texts we will refer to here follow this pattern.

The most dramatic and extensively studied celestial events in the Middle Ages were undoubtedly syzygies, particularly eclipses of the luminaries.[30] Eclipses are, by their nature, very visible events which were – and still are – noted for evoking

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[26] J. Vadianus, *o. c.* (25), 47–49.

[27] M. A. Ryan, *o. c.* (10), 111–112; D. Hayton, *o. c.* (10), 98–117.

[28] M. Azzolini, *o. c.* (11), 128–132.

[29] Rudolf Simek, »Der Untergang der Welt im Jahre 1432 und ihre Errettung durch Johannes von Gmunden«, in: *Johannes von Gmunden zwischen Astrologie und Astronomie*, eds. Rudolf Simek and Manuela Klein, Fassbender, Vienna, 2012, 193–213.

[30] Richard L. Kremer, »Thoughts on John of Saxony's Method for Finding Times of True Syzygy«, *Historia Mathematica* 30 (2003), 264.

strong emotions, usually fear. Medieval chronicles often note that those who observed eclipses were filled with horror.[31] Naturally, such events attracted the attention of astrologers, who were eager to prove their mettle by predicting their time, duration, quality and effects. Examples of this practice in the late Middle Ages do not often refer to Croatian lands, and when they do, these regions are only briefly mentioned in groups of lands and cities under the same sign of the zodiac.

What follows is an example of such practice in the late Middle Ages. In the judgment of the solar eclipse of 1487 (beginning with the notable incipit *Sublimis rerum omnium conditor deus astripotens*), Albert of Brudzewo from the University of Cracow made an extensive study of the effects of the eclipse and grouped them by their influence on social classes and religions. Among the regions which would be affected by the eclipse he listed Dalmatia, Croatia and Slavonia.[32] It is notable that the Ottomans featured heavily in this judgment.[33] This is not surprising as, due to the political situation, the Ottomans started appearing often in astrological predictions in the last decades of the 15th century.[34] Croatia and Dalmatia also appear in prognostications regarding the total lunar eclipse of 1497, perhaps by the same author.[35]

We will illustrate a little more closely the way in which Croatian lands are presented in these writings. Political entities more important to the author were sometimes treated in separate chapters. Croatian lands were never treated in separate chapters, but were mentioned in sections dealing with specific issues. Albert of Brudzewo's prediction for the 1487 eclipse does not contain chapters devoted to specific political entities, but deals with social groups, such as kings, prelates and commoners, Christians, Saracens and Turks. Croatian lands feature in the chapter explaining how the eclipse will affect different areas. This is where knowledge of the geographic position of these lands was important. Albert grouped Dalmatia, Croatia and Slavonia with the areas that would be affected by the eclipse due to

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[31] For examples, see Robert R. Newton, *Medieval Chronicles and the Rotation of the Earth*, The Johns Hopkins University Press, Baltimore – London, 1972, 160–61, 163–64, 236–37, 242–43, 412–13, 511.

[32] Cracow, Biblioteka Jagiellońska (in further text: BJ), Rkp. 2422 I, p. 28. This text appears also in other manuscripts; see Bernhard Tönnies, *Die Handschriften der Thüringer Universitäts- und Landesbibliothek Jena*, vol. 1: *Die mittelalterlichen lateinischen Handschriften der Electorialis-Gruppe*, Harrassowitz Verlag, Wiesbaden, 2002, 178. See also Mieczysław Markowski, »Bóg a determinism kosmiczny w polskich dziełach astrologicznych doby przedkopernikańskiej« [God and Cosmic Determinism in Polish Astrological Texts in the Pre-Copernican Period], *Studia Warmińskie* 27 (1990), 136.

[33] BJ, Rkp. 2422 I, p. 31.

[34] See Darin Hayton, »Astrology as Political Propaganda. Humanist Responses to the Turkish Threat in Early-Sixteenth-Century Vienna«, *Austrian History Yearbook* 38 (2007), 61–91.

[35] BJ, Rkp. 2422 I, p. 23.

its lord (planet which appeared during the eclipse), which was Saturn. The other countries in that group were Crete, Tuscany, Spain, Hungary and Moravia.[36] The fact that the eclipse was bound to occur in a fire sign (Leo), but was governed by a frigid planet would, according to him, cause adverse effects. Another set of prognostications from the same collection as the previous two features separate chapters for Poland, Bohemia, Hungary and Lithuania, while Croatia is mentioned in the chapter *De incendiis urbum et domorum* (*On Conflagrations of Cities and Homes*) among the regions which were, due to the malign influence of Mars, especially susceptible to fires.[37]

The examples we mentioned so far were transmitted in manuscript form, but the printing press soon made it possible for prognostications to reach a much wider audience. In the early 16th century, it became very common for astrologers to publish booklets or flyers containing information about the positions of planets on particular days in the following year(s).[38] These offered advice on the perfect time for a variety of actions, from sowing and planting to cutting one's hair.[39] Members of the University of Vienna, such as Tannstetter and Perlach, would publish such booklets yearly. But publicity brought its own dangers. As we have seen in the examples listed above, astrologers' predictions were vague and general. Albert of Brudzewo limited himself to stating that the 1487 eclipse would have an influence on Croatian lands and explaining the cause of this influence. Some predictions could be somewhat more specific, but also concentrated on explaining the causes, not the effects. The abovementioned passage stating that Croatia would be more susceptible to fires did not guarantee that fires would occur, merely that the planets would exert their influence in a manner that would make them more likely. Jan of Głogów, a distinguished astronomer of the University of Cracow, explicitly stated in his introduction to astrology, *Tractatus preclarissimus in iudiciis astrorum*, that an astrologer should not insist too much on his prognostications. After all, it was God who truly governed the stars, and therefore none of the prognostications based on their motions are infallible.[40] We could add that the reputation of an astrologer who got it wrong would suffer.

Making specific predictions, especially those that were politically charged, was a completely different matter. Here we will briefly recount an example to illustrate why that was so. In a booklet containing his predictions for the year

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[36] BJ, Rkp. 2422 I, p. 28.

[37] BJ, Rkp. 2422 I, p. 19.

[38] In fact, they became so ubiquitous that experts complained how every fool was trying his hand at astronomy. See J. Green, *o. c.* (6), 136.

[39] D. Hayton, *o. c.* (10), 152–153. The practice of making predictions based on the revolution of the year was, of course, much older than that. See M. Azzolini, *o. c.* (11), 62.

[40] Jan of Głogów, *Tractatus preclarissimus in iudiciis astrorum*, Cracow, 1514, fol. 11v. See also M. Azzolini, *o. c.* (11), 58.

1529, Andreas Perlach entered into discussion with the Brandenburgian astrologer Johannes Carion, who had predicted in his booklet *Bedeütnus und Offenbarung*, first published in 1526, that in 1529 Austrians would suffer many tribulations because of Hungary. These tribulations would allegedly be caused by one of the lunar eclipses due that year.[41] Perlach argued that eclipses do not affect all signs of the zodiac equally, and that Austria, which was a Libra, and Hungary, which was a Sagittarius, would not be adversely affected by it.[42] It is obvious that both sets of prognostications were informed by current political events, particularly the threat of an Ottoman invasion, which had loomed over Austria ever since the Ottoman conquest of Hungary in 1526. However, by the end of 1529, both astrologers could claim that they were right, because the Ottoman siege of Vienna, which was troublesome, ended in a victory for the Austrians. This demonstrates that, when it came to making politically relevant predictions, an astrologer had to be aware of his patron's expectations and the current political situation.[43] Andreas Perlach dedicated his predictions to Ferdinand, King of Bohemia, Hungary and Croatia, and claimed that the king's courtiers had persuaded him to publish his work in order to counter Carion's (in his words) false and astrologically ungrounded prognostications.[44] Indeed, it was in the interest of Perlach's dedicatee, King Ferdinand, to assuage the fear caused by predictions of catastrophes. Risking a patron's wrath was not to be recommended and it was therefore prudent to keep the predictions as vague as possible.

As we have seen, astrologers had to be familiar with their patrons' policies, which is a possible explanation of the reason why Croatian lands feature at all in predictions published by the Viennese astronomical circle. As these lands were entering the Habsburg sphere of influence, their fate became a matter of interest to the Austrian public.

So far, we have listed several examples of prognostications related to eclipses. However, other celestial events were also capable of causing great concern. Planetary conjunctions were among the most dramatic of these events, and some of the famous late medieval astronomers and astrologers, such as John Ashenden and Pierre d'Ailly, devoted themselves to studying them.[45] A conjunction of Jupiter

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[41] Johannes Carion, *Bedeütnus und Offenbarung warer Hymlischer Influxion*, Berlin, 1526, fol. 8r–8v. This text circulated widely and was often reprinted; see J. Green, *o. c.* (6), 146.

[42] D. Hayton, *o. c.* (10), 163–165. This passage explains the political background of this issue.

[43] M. Azzolini, *o. c.* (11), 97. Casting a geniture for a politically powerful individual carried a great personal risk for the astrologer and sometimes required obfuscating the data derived from calculations; see *ibid*, 103–114. See also J. Green, *o. c.* (6), 125.

[44] Andreas Perlach, *Ephemerides Andree Perlachii Stiri... pro anno Domini et Salvatoris nostri Iesu Christi M. D. XXIX*, Vienna, 1528, fol. 1v.

[45] H. M. Carey, *o. c.* (10), 85–90; L. Ackerman Smoller, *o. c.* (4), 20–22.

and Saturn was considered to be especially significant,[46] and a conjunction of all planets in the same sign of the zodiac was of momentous importance. For example, in 1524, the year of Marko Marulić's death, a great conjunction of all the planets occurred in the sign of Pisces. This was a grand event and the foremost astrologers of the time scrambled to interpret its influence. As Pisces is a water sign, the most common opinion was that the conjunction would bring floods. This caused a »flood panic« in Christian Europe.[47]

That time it was Tannstetter who took on the task of soothing the public. He published a treatise on the conjunction (with Andreas Perlach's help), arguing that no great flooding would take place,[48] but he kept his interpretation of the influence of the conjunction on world politics deliberately vague. He concluded that most of the European countries would not be strongly affected by the celestial event.[49] Among them, of all the Croatian lands mentioned earlier, he listed only Dalmatia. This might have been meant to signify all of them as *pars pro toto*, but not necessarily so, since Tannstetter was, as we will see in the following text, familiar with the names of other Croatian lands as well. Besides, the list in which Dalmatia appears also includes parts of certain other countries. These are Portugal, England, Ireland, Normandy, Norway, Denmark, lands around the North Sea, Hungary, Jerusalem, Silesia, Württemberg and the Venetian lands (probably restricted to Northern Italy, as bundling all lands under Venetian rule together would not make sense geographically), as well as some notable cities.

Another point of interest in this set of predictions is Tannstetter's statements regarding the Ottoman menace. He admitted that he could not avoid mentioning that subject, as the whole world, as he wrote, feared the Ottomans. He said – vaguely – that the possibility of the conjunction bringing an Ottoman attack should not be disregarded. However, Christians should not lose heart, as the Christian champion Charlemagne had won a great victory against the pagans of the East when the planets aligned in the sign of Pisces. In short, the astronomer advised caution, as it is always possible that God would try Christians with Ottoman attacks.[50] This probably reflects the growing fear of the Ottomans among Tannstetter's public and the interest of his Habsburg patrons in the matter of Ottoman expansion.

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[46] Not as many astronomical tables regarding conjunctions as those regarding syzygies are preserved. It is possible that astronomers were interested only in particular instances of conjunctions. See José Chabás, »Characteristics and Typologies of Medieval Astronomical Tables«, *Journal for the History of Astronomy* 43 (2012), 280.

[47] See Robin B. Barnes, *Astrology and Reformation*, Oxford University Press, New York – Oxford, 2015, 82–130.

[48] D. Hayton, *o. c.* (10), 180–185; J. Green, *o. c.* (6), 132–133 and 139–150.

[49] Georg Tannstetter Collimitius, *Zu eren und gefallen dem durchleuchtigisten grosmechtigen fürsten und herrn herrn Ferdinando*, Vienna, 1523, fol. 20v–21r.

[50] G. Tannstetter Collimitius, *o. c.* (49), fol. 17r.

Here we will list a few other examples of predictions which include Croatian lands. It is important to note that in all these texts predictions are made for groups of countries, regions or cities under the same sign of the zodiac, which meant that they were appropriately vague. Tannstetter's prognostications for the year 1513, which was to be dominated by Mars, predicted that the lord of the year would, appropriately, bring terrible wars (*Mars… terribiles bellorum strepitus iterum atque iterum increbrescere faciet. Rancores igitur et odia mox ab anni principio*.).[51] However, lands under the signs of Leo, Scorpio and Aquarius would fare somewhat better than others, although they would also suffer wars, arson, rape and pillaging. Those included Dalmatia and Istria (*Que Leoni Scorpioni et Aquario subiitiuntur consimilem fere conditionem ex premissis causis celestibus obtinebunt, paulo tamen meliorem. Talia sunt Italia Bohemia Apulia Sicilia, Gallia cisalpina, Roma Ravenna Cremona Mantua Badua Arabia Dalmatia Histria*).[52] The preceding year, 1512, was also unfortunate. Tannstetter wrote that the lands under the sign of Scorpio, which included Dalmatia and Croatia, would have bad fortune for most part of the year (*Et quemadmodum loca Scorpioni subdita scilicet Dalmatia Croacia, et magna pars Carniole et pars Stirie, per maiori parte anni infelicem statum*).[53] Here we see that, just like Albert of Brudzewo several decades before, Tannstetter knew of the existence and general status of Croatian lands, but it appears that they were all considered to be under the same sign of the zodiac.

The absence of Slavonia in Tannstetter's predictions is notable. However, that does not mean that astrologers completely omitted it. As we have seen, Albert of Brudzewo did not. If we search the publications of other Polish astrologers, we will notice that Slavonia does appear, even in quite significant places. In his predictions for the year 1523, Mikołaj of Szadek (c. 1489–1564), a member of the Cracovian circle, included a chapter on Hungary and Slavonia, titled *De Hungaria et Sclauonia*. He predicted they would suffer invasions (probably referring to the Ottoman menace), but that they would easily defeat the invaders provided they did not abandon each other (*incursiones et damna illis imminebunt, tum nisi sibi ipsis defuerint facile repugnabunt*).[54]

The fact that countries had their own zodiac signs should not surprise us, considering that horoscopes could and were cast for various things or occurrences. If we return to Jan of Głogów's introduction to astrology, we see it explained that cities, castles, countries and other entities all have their signs. In Głogów's

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[51] Georg Tannstetter Collimitius, *Iudicium astronomicum pro anno Christi MCCCCCXIII*, Nürnberg, s. a., fol. 2v–3r.

[52] G. Tannstetter Collimitius, *o. c.* (51), fol. 3v.

[53] Georg Tannstetter Collimitius, *Iudicium Viennense anni millesimi quingentesimi duodecimi*, Köln, s. a., fol. 5v.

[54] Mikołaj z Szadka, *Iudicium Astronomicum Magistri Nicolai de Shadek in studio Cracouiensi ad annum domini 1523 editum* (Cracow, s. a.), 31.

words, these could be determined by knowing the time of their foundation, but generally they were handed down by tradition. Knowing their sign was key for making prognostications concerning them. A conjunction of opposed planets (such as Jupiter and Saturn), an appearance of a comet, or an eclipse occurring in the sign of a country were bad portents, while conjunctions of compatible planets (such as, for example, Venus and the Moon) in it were good portents. Although he does go into detail about the signs of Poland, Bohemia, and Hungary, Jan of Głogów, unfortunately, does not mention the signs of Croatia, Dalmatia or any of the Croatian lands.[55] Let us therefore consider the opinions of astrologers who did make predictions for these lands about this matter.

We have seen that Tannstetter categorically placed Croatia and Dalmatia under the sign of Scorpio. Nevertheless, it should be noted that this opinion was not unanimous. For example, in a judgment on the influence of a comet that appeared in 1468, Martin Bylica of Olkusz, the court astrologer of King Matthias Corvinus and archdeacon of Zagreb, placed Dalmatia under the sign of Virgo. In his case, he reveals that his source for the zodiac signs of regions was the third chapter of the second book of Ptolemy's *Tetrabiblos*.[56] This explains Głogów's statement about these signs being handed down by tradition. It is unclear why other astrologers deviated from this tradition. A set of prognostications from BJ, Rkp. 2422 I, which we mentioned earlier, placed Croatia and Dalmatia in the quadrant under the signs of Aries, Virgo and Sagittarius,[57] while another set from the same collection places Croatia in a group of countries under the signs of Sagittarius, Gemini, Aries and Capricorn.[58]

Although it is unclear which of these signs they assigned to Croatia, it seems that a common opinion was that it lay under the sign of Sagittarius. A codex containing a collection of 15th and 16th century astrological writings includes a table in which countries and cities are grouped under their respective zodiacal signs, titled *Quibus signibus que terrarum plage subdite*. Tables such as this one probably circulated in astrological circles and astrologers might have referred to them when composing their predictions. This is obviously a way of handing such knowledge down by tradition. The table in question is grouped with the writings of Johannes Werner (1468–1522), who was also connected to the Viennese school

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[55] J. Głogów, *o. c.* (40), fol. 21r–21v.

[56] München, Bayerische Staatsbibliothek, Clm 9024, fol. 113r–113v. Regarding Bylica's judgment on the passing of the comet in 1468, see Darin Hayton, »Martin Bylica at the Court of Matthias Corvinus: Astrology and Politics in Renaissance Hungary«, *Centaurus* 43, No. 3 (2007), 189–192. Regarding Bylica's career at Matthias Corvinus's court, see Darin Hayton, »Expertise *ex Stellis*: Comets, Horoscopes, and Politics in Renaissance Hungary«, *Osiris* 25, No.1 (2010), 27–46.

[57] BJ, Rkp. 2422 I, p. 23.

[58] BJ, Rkp. 2422 I, p. 19.

of astronomy. In the table, Dalmatia and Croatia were listed under the sign of Sagittarius (together with Hungary, Spain, Jerusalem and several other countries and cities), to which a hand different from the one of the original writer added Slavonia.[59] Here we will not delve into this matter, as it will suffice to conclude that opinions regarding it differed. However, it is interesting to note that, although astrologers did not regularly conflate Croatia with Dalmatia or Slavonia, they did usually place them under the same astrological sign, which would for them consequently mean that these lands shared the same fate and fortune.

4. Conclusion

As we have seen, late Medieval and Renaissance astrologers were able to make and did make predictions regarding Croatian lands. We have established that the general geographic position of these lands was known and that it was possible to calculate the relevant astronomical parameters for making predictions. The coordinates of Dubrovnik were included in manuscripts, those of Senj and Zagreb were repeatedly printed in contemporary pamphlets, and the zodiacal sign of Croatian lands was known, although opinions regarding it differed. However, when it came to publishing actual predictions, these lands were usually mentioned in passing and together with other lands under the same sign of the zodiac. The predictions were general, even more so than for other places closer to the author or his patron.

One of the more significant finds is that astrologers normally differentiated Croatia from Dalmatia. The latter is more often mentioned in predictions, perhaps because it was politically separate from Croatia, being subject to the Republic of Venice, while Croatia was joined to the Kingdom of Hungary. Croatia might have therefore sometimes been lumped together with Hungary. However, astrologers were aware that Croatia and Dalmatia were separate entities and did not confuse one with the other. Slavonia was, in the sample studied in this paper, mentioned in Polish sources, notably in the predictions of Albert of Brudzewo and Mikołaj of Szadek, as well as in the list of countries according to their zodiacal signs. This, however, does not mean that it was not present in other prognostications, rather that a larger sample should be studied before such conclusions could be made. The purpose of this study was to demonstrate that Croatian lands did feature in late Medieval and early Renaissance astrological prognostications, and to explain why and in which manner they were included in them.

Regarding this last question, it is possible that members of the Viennese circle of astronomers mentioned the Croatian lands because these lands were within the Habsburg sphere of interest at the time when their prognostications were written,

[59] ÖNB, Cod. 5212, fol. 5r.

and the Habsburg monarchs were patrons of the University of Vienna in general as well as of many of the Viennese astronomers in particular, such as Tannstetter or Perlach.

Of the specific places in Croatian lands, Marulić's Split did not appear in medieval and Renaissance astronomical treatises – contrary to Dubrovnik and Senj, and later Zagreb. Also, although the Croatian area was seen as a point of collision between the Ottoman Empire and Christendom, as we have seen in Vadianus's work, they never, in the studied sample, appear in predictions about the sultan and the Ottomans. The sample studied in this analysis shows that the Croatian lands were mentioned and differentiated from one another, and predictions were made regarding them, but these predictions were made for all locations grouped under the same zodiac sign.

Tomislav Matić

HRVATSKE ZEMLJE U KASNOSREDNJOVJEKOVNIM I RANORENESANSNIM ASTROLOŠKIM PREDVIĐANJIMA I ASTRONOMSKIM SPISIMA – PRIMJERI IZ SREDNJOEUROPSKIH IZVORA

U kasnom srednjem vijeku i ranoj renesansi astrološka su predviđanja sastavljana na pseudoznanstveni način, odnosno njihovi su ih autori, kao i publika kojoj su bila namijenjena, percipirali kao rezultate znanstvenog rada. Za takva je predviđanja bilo potrebno veliko poznavanje matematike, astronomije, geografije i tekućih političkih događaja. Astrolozi su često djelovali kao savjetnici tadašnjih vladara i preuzimali bi zadatak umirivanja javnosti koju bi uzbunila nepovoljna predviđanja drugih, suparničkih astrologa. U ovome radu naveli smo primjere Georga Tannstettera i Andreasa Perlacha, koji su u ime habsburških vladara osporavali nepovoljna predviđanja o poplavama i osmanskim napadima. Takvo je djelovanje moglo uključivati polemike s drugim astrolozima.

U vezi s hrvatskim zemljama naša je analiza utvrdila da su kasnosrednjovjekovni i ranorenesansni astrolozi posjedovali dovoljno podataka da znaju za njihovo postojanje i općenit položaj. To znači da su bili u stanju geografski ih locirati dovoljno precizno da izračunaju kretanje planeta iznad njih u mjeri koja je bila potrebna za sastavljanje astroloških predviđanja. Podaci potrebni za izračune u vezi sa Zagrebom i Senjom bili su višekratno objavljivani u tadašnjim publikacijama. Astrolozi su stoga mogli u vezi s njima predviđati učinke astronomskih fenomena, poput pomrčina i konjunkcija. Međutim, mišljenja su se razlikovala oko toga koji je astrološki znak Hrvatske i Dalmacije. Dok ih je Martin Bylica u 15. stoljeću svrstao pod znak Djevice, Tannstetter ih je u 16. stoljeću podredio Škorpionu.

Analizom predviđanja pronađeni su spomeni hrvatskih zemalja, ali samo svrstanih u veće skupine zemalja, regija i gradova pod istim znakom Zodijaka. U tim se skupinama najčešće spominju Hrvatska i Dalmacija, dok je u proučenom uzorku manje spomena Slavonije. Predviđanja o kojima se radi bila su općenito neizravna i govorila su samo o dobroj ili lošoj sreći u nadolazećoj godini ili u vezi s nekim astronomskim fenomenom. Razlog za ovo mogao je biti u tome što su se predviđanja sastavljala uglavnom za kraljevstva i političke faktore, dok su Hrvatska i Dalmacija možda percipirane kao podređene većim državama poput Ugarske ili Mletačke Republike. Mnoga se predviđanja dotiču osmanske opasnosti, koja je tada smatrana jednim od političkih pitanja od najveće važnosti. Tadašnji autori, poput Joachima Vadianusa, znali su da su hrvatske zemlje izložene osmanskim napadima. Međutim, analiza takvih predviđanja nije otkrila podatke koji bi se ticali hrvatskih zemalja. Naš je uzorak bio ograničen na srednjoeuropski krug astronoma i moguće je da bi veća količina materijala donijela bolje rezultate.

Ključne riječi: astronomija, astrologija, geografija, renesansa, hrvatska povijest