

4.4.

Kepler in Prague, 1600–1612

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IN HIS *Dissertatio cum Nuncio Sidereo*, Prague-stationed Kepler, in the middle of April 1610, analyses Galileo's announcement of his epoch-making telescopic discoveries. In his introduction to the first complete translation,¹ Edward Rosen writes: "Thus for a week or less, there was an unusual intellectual encounter between two geniuses. Such a dialogue is rare indeed in the annals of science, which can show few, if any parallels to this colloquy between two of the greatest astronomers of all time."

During an interview with the Tuscan ambassador in Prague on 13 April 1610, Kepler was asked to write his comments on Galileo's *Nuncio Sidereo*, just published in Florence, Italy. Kepler delivered his "Dissertatio" within a week, in time for the official courier's return to Tuscany. Kepler recorded his enthusiastic comments and acceptance of Galileo's observations without first having had an opportunity to verify these revolutionary discoveries by his own observation. As Max Caspar states,² although Julian de Medici had already advised Galileo by April, 1610 to place a telescope at the disposal of the great astronomer at the Prague Imperial court, it was not until August 1610, long after the *Dissertatio* was published in Prague, that Kepler's eager wish was fulfilled—to observe for himself Jupiter's moons. Kepler finally obtained a telescope, but not directly from Galileo. The Elector of Cologne—the Duke of Bavaria—visiting Prague, brought with him from Vienna one of the telescopes presented by Galileo, and this he placed at the disposition of the imperial mathematician for a short time.

Kepler's theoretical evaluation of Galileo's initial telescopic discoveries is indeed one of the most unusual incidents of Kepler's rich period in Prague. This particular

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event took place in the tenth year of his Prague residence. Despite Kepler's reluctance to move from stuffy Graz to Prague and his difficult dealings with Tycho Brahe, Prague proved to be the only right place for the peregrinating life of the uprooted great astronomer.

In the ominous and restless eve of the Thirty Years' War, Kepler was left undisturbed in his progressive astronomical studies during the 12 years he remained in Prague (1600–12). It was indeed the most creative period of his life. Kepler's brief *Dissertatio* was published actually one year after his major revolutionary work *Astronomia Nova*, in which he broke the enduring "obsession of circularity", to use Alexandre Koyré's expression, and introduced his elliptical planetary orbits. In this respect, Galileo's complete silence on Kepler's major discovery in *Astronomia Nova*—of which he was well informed—although considerably discussed, still remains enigmatic.

The object of this note, however, is to trace to some extent the general atmosphere and a few of Kepler's Czech friends in Rudolphine Prague. There, the Copernican astronomer was relatively favorably placed when, in that turbulent Europe of the first half of the seventeenth century, Copernicanism definitely belonged in the category of dangerous ideas. There is no question but that the welfare of true unfettered science is a sensitive barometer of human society. One wonders then what produced such unique conditions that Prague in Kepler's years was an island of relative freedom. It was elsewhere the period when in Wittenberg the paragon of Protestantism, Martin Luther, rudely condemned the Copernican world view; France inflicted the terror of St. Bartholomew's night; in Rome a shroud of flames silenced Giordano Bruno, and the trial of Galileo intimidated Descartes from publishing his comparatively cautious treatise.

Religious and political conditions in Bohemia and its capital, Prague, that traditional crossroad of Europe, on first examination were exceedingly complex if not actually precarious due to the quarrel between the Emperor Rudolph II and his brother, Archduke Matthias. Nevertheless, this complexity produced an historically rare paradox of *modus vivendi* which balanced highly divergent and controversial forces. In this seemingly explosive atmosphere, the pious and mystical-minded Kepler with his frank theological reservations could freely mingle with Protestants and Catholics. Later, in Linz, after leaving Prague, his own Lutherans accused him of Calvinist leanings, which excluded him from Holy Communion in his own faith, a serious social ostracism at that time. In that world fraught with religious intolerance, Prague was sought out by scholars and artists and Kepler moved freely between his Swabian homeland and Bohemia without the present cumbersome travel documents introduced in our jet-propulsion age.

Before the Hapsburgs usurped the throne of the Bohemian kingdom in the person of Archduke Ferdinand, who later became the notorious Emperor Ferdinand II, the Archduke made a pilgrimage to Loretto in Italy, in 1598. There, he vowed to

root out heretics from his dominions, which later included the territories of the crownland of Bohemia. His cousin, Emperor Rudolph II, was certainly of a widely different character. While Rudolph was also raised by Spanish Catholic extremists, his devotion to the arts and sciences minimized his concern for the doctrinal beliefs of the numerous scholars and artists whom he invited to his Prague court. This aspect of Rudolph's character has been described as political weakness by various historians, whereas it actually constituted the strange basis for Kepler's freedom of faith and the radicalism of his scientific ideas, which went far beyond anything Copernicus ever dared. This haven of freedom on that bizarre island of Rudolphine Prague lasted but a little while before the portentous clouds of another post-Hussite accusation of counter-revolution gathered over Bohemia on the eve of religious wars. Emperor Rudolph II, therefore, was the most important of Kepler's friends (Fig. 4.7).

Rudolph's sympathy for science, however, did not always assure financial support. His well-known deplorable arrears in salary payments to the imperial mathematician provided many agonizing days for Kepler. Yet this indicates that the flourishing science in Kepler's time in Prague and the freedom of publication of unorthodox ideas as contained in *Astronomia Nova* (1609), did not necessarily depend upon privileged financial support which, when combined with obligatory secrecy, tends to stifle the healthy growth of scientific progress.

The most significant example of the feeble position of Copernicanism in Kepler's time, showing the tenacious tradition of Aristotelean philosophy, is that of the considerably younger Protestant contemporary of Kepler, J. A. Comenius or Komensky, the famous founder of modern educational method. Komensky's *Physica Mundi*, which was based on the Ptolemaic world view, was a most popular physics text for half of the seventeenth century. Several years after Galileo's condemnation in Rome for his defence of the Copernican system, Komensky wrote his ardent opposition to the heliocentric system, *Refutatio Astronomiae Copernicanae*.

The majority of Kepler's friends in Prague were Protestants. They belonged either to the denomination known as the Augsburg Confession, to the Utraquists, or to the *Unitas Fratrum*, i.e. Bohemian Brethren. This was symptomatic indeed of what was to occur after Rudolph's abdication and death in 1612. Kepler, still carrying the honorable title of imperial mathematician, then soon left Prague for the remainder of his life, for uncertain years starting with Linz. When Emperor Rudolph II, on the recommendation and mediation of his court physician and astronomer, Tadeas Hagek, known in Latinized form as Hagecius, summoned Kepler's friend Tycho Brahe to Prague, and the latter in turn invited Kepler, there arose in Prague the impulse for a new astronomy, which in due course paved the way for Newton. Kepler's *Somnium, seu Astronomia Lunari*, begun already in 1585 in Tübingen, obtained a curious final formulation in Prague. In this volume he starts his story with the legendary Czech queen, Libusha, giving then the earliest realistic and rational description of a journey to the Moon. It can therefore be assumed that man's landing

on the Moon, which we have witnessed recently in the case of the triumphant Apollo flights, had its speculative roots in Rudolphine Prague.

Of other Prague friends, besides Tycho Brahe, Kepler first associated with Jan Jesensky (also known as Jessenius), of Slovak origin, born in 1566 in Silesian Wroclaw, then part of the crownland of Bohemia. Jesensky, the learned doctor and anatomist, patiently mediated between Kepler and Tycho Brahe in order to bring together and conciliate the frequent differences between two great astronomers of widely divergent character. Jesensky remained Kepler's close friend throughout his Prague period. As a famous anatomist, he offered the astronomer valuable information on the structure of the human eye when Kepler made his famous pioneering optical studies. Kepler's optical work *Ad Vitellionem Paralipomena*, one copy of which he dedicated to professors of Prague University during Easter 1605,³ paved the way to modern optics and its application to astronomy.

The career of Jesensky represents an important chapter of tragic Czech history. As a close friend of Tycho Brahe's, he pronounced the famous funeral oration at Tycho's elaborate funeral ordered by Emperor Rudolph in October 1601. In 1618 Jesensky became rector of Prague University and intended to invite Kepler back to Prague. However, as a member of the Directorate, he was greatly involved in the opposition to Archduke Ferdinand's becoming heir to the Bohemian throne. After the defeat of Czech Protestants in the battle near Prague (1620), by order of Emperor Ferdinand II Jesensky was among twenty-seven leading members of the Directorate who were executed. This took place on the Old Town Square, opposite the very Týnský Cathedral where 20 years earlier Jesensky had delivered the Tycho Brahe funeral oration. His execution was performed with excessive vengeance by Spanish mercenaries under Emperor Ferdinand II. Jesensky's tongue was first torn out and nailed on the scaffold before the ghastly act of beheading.

Kepler's devoted Utraquist friend, Martin Bacháček of Nauměřice, escaped the apocalyptic years of the fanatic Ferdinand's anti-reformation, since he died in 1612. Bacháček was first the Provost of the College of King Václav (Wenceslaus) before becoming rector of the Prague Charles University during Kepler's time. Bacháček taught mathematics and was keenly interested in Kepler's astronomical studies. He also offered Kepler permanent accommodation in his home which today is at the place called Ovocný trh. Also, because Belvedere Castle was no longer used for observation after Tycho Brahe's death, Bacháček had built for Kepler an observation platform. This now non-existent platform may claim an important event in the history of astronomy. There, both Kepler and Bacháček often observed together as they did on 28 May 1607. On that day Kepler noted a black dot on the surface of the sun and had it verified not only by Bacháček, but later by others at Hradčany Castle where he hurried to share the news. Since it was at the time of a Mercury conjunction, Kepler thought it to be the transit of this planet. A few years later he admitted his error when his friend, Johannes Fabricius, son of the astronomer David Fabricius, made the first

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announcement of the observation of sunspots which were then easily recognizable with the newly invented telescope. At this report Kepler was to exclaim:⁴ "Lucky I, who was first in this century to have observed the spots."

Another eminent Czech Protestant friend of Kepler's was Václav Budovec of Budov, valiant leader of the Unitas Fratrum. Although of advanced age, with Jan Jesensky he courageously headed the martyrs executed at Prague Old Town Square in 1621. Václav Budovec was a learned member of the Bohemian Brethren. In an interesting volume he described his visit of several years to Palestine, warning against the Turkish menace then hanging over struggling Europe. His Calvinist sympathies especially drew him to Kepler, his close friend.

Kepler's associations with these controversial and highly individualistic personalities, then later in Linz his open and undiplomatic sympathy for the tragic Protestant Bohemian King Friedrich of the Palatinate, son-in-law of the English King James, were symptomatic. They indicate that Kepler's stay in Prague, if prolonged after Emperor Rudolph's death, would indeed have been no less fateful than was the remainder of his life, torn and harassed by the war of religion, an antithesis of his philosophy of reconciliation. His own statement characterizes his feelings and remains valid for our age:⁵ "When the storm rages and the shipwreck of the state threatens, we can do nothing more worthy than to sink the anchor of our peaceful studies into the ground of eternity."

Since his time, Kepler's peaceful celestial studies have made an unparalleled leap forward, yet were in no position to secure the peace Kepler so earnestly desired. Nevertheless, the close link of morality with science which permeates the life of Kepler represents the only key with which science can achieve its highest contribution for mankind.

References

1. "Kepler's conversation with Galileo's sidereal messenger". First complete translation with an Introduction and notes by EDWARD ROSEN. *The Sources of Science* No. 5, Johnson Reprint Corporation, New York and London, 1965, p. xvi.
2. MAX CASPAR, *Kepler, 1571-1630*. Translated and edited by C. DORIS HELLMAN. Collier Books, New York, N.Y., 1962, p. 204.
3. "Rukopisy a vzácné tisky pražské universitní knihovny". *Státní pedagogické nakladatelství, Praha* 1957, p. 57, Fig. iii.
4. Max Caspar, *op. cit.*, p. 173.
5. Max Caspar, *op. cit.*, p. 360.

Editorial Note. At the conclusion of the Prague Kepler festivities a discourse on the theme "Kepler, Tycho and Prague" was given on 24 October 1971, in the Teynkirche where Tycho is buried, by Professor Hugo Rokyta of Prague University. He also spoke on "Kepler in Prague" at the Graz Symposium in May 1971.