

## Traces of a University Career in Renaissance Brandenburg: The Scottish Mathematician and Physician John Craig at Frankfurt on Oder

### I Early Modern Itinerant Careers of Scholars from the British Islands

John Craig of Edinburgh (died *c.* 1620) is one of those Scottish intellectuals who travelled across continental Europe, received a higher education in the main academic and cultural centres of the Renaissance, and eventually brought back to Britain experience and knowledge gained abroad. Craig spent about ten years at the Brandenburg University of Frankfurt on Oder. After serving for many years as a professor of mathematics and logic, and obtaining a medical degree from Basle, he returned to Scotland. He probably practiced medicine before becoming court physician to James VI of Scotland. He followed James to England at the time of his coronation in 1603. There, he was incorporated in the College of Physicians, as well as at Oxford University.

Craig's intellectual and professional career has an international dimension: it connects Renaissance Scotland with Germany and England. However, circulators of knowledge such as Craig did not simply appropriate, mediate, and transfer knowledge between countries and cultures. They also reshaped disciplines and institutions. Their networks of bonds--of varying intimacy--were first established through visits and

personal exchanges, and then nurtured through exchanges of letters, books, scientific data, instruments, and verses.<sup>1</sup>

The *respublica literarum* was thus produced and reproduced, continuing a Renaissance model of sociability, which found in Erasmus of Rotterdam one of his most visible champions--and in Philipp Melanchthon an influential reference point in a time of confessional struggles.<sup>2</sup> The existence of itinerant and extended scholarly networks was the necessary basis for international scientific transactions. In fact, science was shaped by communication, transfer, and circulation long before Henry Oldenburg institutionalized this form of collective endeavour. The *Philosophical Transactions* were the printed embodiment of a fluid reality that might be aptly labelled as 'science in transit'.<sup>3</sup> The appearance of the first scientific journals improved on the fluid and confabulatory world of Renaissance exchanges. Craig definitely belongs to an epoch in which oral culture and manuscript circulation of ideas was still widespread. The only substantial scientific work of his that is still extant (though incomplete), is a long refutation of Tycho Brahe's cometary theory, which has been printed in the latter's *Opera omnia*.<sup>4</sup> For the most part, however, Craig's scientific activity is relegated to the oblivion of unrecorded oral exchange.<sup>5</sup>

Other British *clerici vagantes* of the age are better known: John Dee, for example. His peregrinations are often mentioned in accounts on Renaissance intellectual mobility. Dee visited Louvain and Paris, Urbino and Prague, among other places, where he networked, sought patrons, and met leading mathematicians and philosophers such as Gemma Frisius, Gerhard Mercator, Pierre de la Ramée, Oronce Fine, and Federico

Commandino, to name a few. The patronage he received in his homeland from the Tudor court was erratic, and never constituted a fully reliable basis for his research activities.<sup>6</sup>

Traveling in search of better material conditions and stimulating scholarly environments was often a necessity. It could be seen as an investment, as well. Craig's pupil Duncan Liddel came from a modest family of Aberdeen, and he enhanced his own economic and social status by studying abroad. First, Liddel sought his fellow countryman's protection at Frankfurt, where he enrolled in 1579. There, he lived in professor Craig's house, receiving instruction in mathematics and logic. The Aberdeen professor Gilbert Gray, who had been a student of Liddel in Germany, commented in 1613 about Craig's hospitality:

When he [Liddel] arrived at Frankfurt on Oder in order to study, he was unsure about what to do and was without means, but he encountered his compatriot, the very illustrious Dr John Craig, who benefited then from highest consideration and honour and today is the court physician to our very powerful king. [Craig] held the chair of mathematics and logic. [Liddel] was liberally admitted not only to his teaching but also to his table. From him he learned with diligence the disciplines that he most loved.<sup>7</sup>

The cohabitation of professors and students was far from uncommon in those times.

Some years later, Liddel, now a professor at Helmstedt, returned the favour by accommodating John Craig, his mentor's nephew.<sup>8</sup>

Thanks to his master's support, Liddel was introduced to the humanist circle of Andreas Dudith-Sbardellati in Breslau (Wrocław). Such an introduction enabled him to become acquainted with the physician Johannes Crato and the mathematical astronomer Paul Wittich. When Craig left Germany, Liddel moved to the late-humanist university centres of Rostock (1584-1591) and Helmstedt (1591–1607). He taught mathematics at Helmstedt for many years, before acquiring in 1596 the title of doctor of medicine; then he transferred to the more prestigious faculty of medicine. Back to Scotland in 1607, he ingratiated James VI and I with a dedication of his textbook on Galenic medicine, *Ars medica* (1607 and 1608). In his hometown Aberdeen he acted as a patron of the arts and of learning. In 1612 he granted some of his possessions in mortmain to the Marischal College, in order to support six student fellows. Moreover, in his will, he instructed his executors to furnish Aberdeen college with 6,000 marks for the founding of a chair of mathematics.<sup>9</sup> Such foundations were directly inspired by Melanchthonian school reform, according to which mathematics was accorded a honored place among the disciplines of the faculty of arts--or the philosophical faculty, as it was usually called in the German lands.

Liddel's efforts are not unique at a time when British scholars strove to emulate continental cultural and institutional models.<sup>10</sup> The case of the English Greek-scholar, Henry Savile is well known. After completing a European *cursus studiorum*, similar to the one undertaken by Craig and Liddel, he imported similar institutional models by endowing two professorships at Oxford.<sup>11</sup>

## II Craig's Short Prosopography

Craig came from a bourgeois background; his father, Robert, was an Edinburgh merchant.<sup>12</sup> His elder brother, Thomas, studied at St. Andrews and Paris and became an acknowledged lawyer.<sup>13</sup> Thomas authored important legal treatises. The most famous--*Jus Feudale* (Feudal Right) (1603)--earned him a position in the Scottish court. In 1603, he accompanied King James to England and attended the coronation ceremony; in the following year, the Scottish Parliament entrusted him with a role in the negotiations of the union with England. Owing to his political-intellectual position, Thomas has been compared to James's future chancellor: 'His writings had all a public and patriotic end--to promote the union and to allay the jealousies of both nations. In that respect he may be compared to Bacon, who laboured earnestly for the same object from the English side'.<sup>14</sup> For his efforts he was rewarded with a knighthood.

John Craig certainly benefited from his brother's social ascent to the *noblesse de robe*. This should have eased his entrance into the inner circle of court *intelligentsia*, as well as his admission to prominent English institutions such as the College of Physicians, in spite of the fact that his foreign origins raised rumours concerning the legitimacy of the admittance.<sup>15</sup> In August 1605, he was incorporated at Oxford, too. His successor as a court physician was his brother's son, John, who had followed in his footsteps by studying in continental Europe.

During his lifetime Craig published nothing--unless one considers his scientific correspondence, and the manuscript circulation of his cometary writing, as a form of publication. Yet, he was an acknowledged scientific interlocutor and correspondent. He had been credited with furnishing John Napier with the decisive impulse that led to the

discovery of logarithms--a useful mathematical means to simplify computations, especially in astronomy. It is likely that Craig also discussed with Napier the so-called method of ‘prostaphaeresis’, used by continental scholars such as Wittich of Breslau to ease computations. (It comprised of a trigonometric rule for the transformation of sines products into sums). The discussion of the *prostaphaeresis* method might have triggered Napier’s inquiry; Craig certainly was among the first who learned about the discovery which he communicated to Brahe in 1594.<sup>16</sup>

Craig’s relation with the Danish astronomer became stained by a multi-layered controversy, sparked by debates over supra-lunary position of comets, and extended to the tenability of Aristotelian physics, the legitimacy of astrology, heliocentrism, and the discovery of the geo-heliocentric system.<sup>17</sup> Craig’s sceptical--or at least critical--reaction to Brahe’s planetary hypotheses, articulated in a letter dated 9 July 1589, ignited the controversy:

The strange feature of your hypothesis is not that the Earth is the centre of the luminaries [the Sun and the Moon] and the Sun [is the centre] of the other planets. Rather, it implies the absurdity that Mars, during his retrograde motion, comes closer to the Earth than to the Sun. It would be more expedient to posit a point closer to the Earth than to the Sun as the centre or, if you do not agree with this, to enlarge the sphere of the superior planets by introducing a double epicycle according to a reworking that Magister Duncan Liddel communicated to me. Such a hypothesis does not imply any absurdity. In fact, it does not only avoid your [absurd assumption] but also permits one to maintain the planetary spheres. There

are various manners to conceive them and I will expand on my opinion thereabout in the future. My major effort is to satisfy physics and mathematics at once.<sup>18</sup>

Craig was evidently discussing the geo-heliocentric diagram published by Brahe in his cometary work, *De mundi aetherei recentioribus phaenomenis* (On the most recent phenomena in the ethereal world) (1588). It represented a hybrid system. In it the Earth is at the centre of the circles of the Moon, the Sun (the so-called 'luminaries'), and the fixed stars, whereas the planets rotate around the Sun. According to Brahe's diagram, the deferent of Mars crosses that of the Sun. Brahe claimed that this intersection was necessary, as a consequence of his measurement of Mars' parallax and the ensuing demonstration that, when this planet is opposite to the Sun, it comes closer to the Earth than the Sun ever does.<sup>19</sup> This intersection was tenable only if one assumed that the heavens are fluid--against traditional views about the existence of solid spheres accounted for the motion of celestial bodies. As a matter of fact, this fluidity could be evinced by the parallax measurement of cometary trajectories across the heavens. Although this claim was not uncontroversial, it was widely embraced by mathematical astronomers such as Brahe. Yet, the heavenly nature of comets was at odds with the influential Aristotelian conception of comets as meteorological phenomena.<sup>20</sup> The discussion of planetary theory, the system of the world, comets, the nature of the heavens, and the Aristotelian legacy were therefore necessarily entangled.

Craig's language wounded Brahe's pride, and awoke in him resentment concerning the inadequate acknowledgment of astronomical theories, of which he considered himself the sole discoverer. In retaliation, he wrote a rude response--the

*Apologetica responsio ad Cragium Scotum de cometis* (Apologetic answer to Craig the Scot on comets). In the same year, Brahe accused Craig's associate, Liddel, of plagiarism, as he suspected the latter of teaching the geo-heliocentric planetary hypotheses to his Helmstedt students, without due acknowledgement of Brahe's authorship of the discovery.<sup>21</sup>

It is not necessary to elaborate on these polemics, as they have been studied in detail by others. Instead, I would like to shed some light on an unexplored period of Craig's life--the eleven years he spent at Frankfurt on Oder. Documents that I have examined in archives at Potsdam and Berlin provide us with new insights into the institutional life of this early modern professor of mathematics in Renaissance Brandenburg.

### III Relevant Documents on the University of Frankfurt in Craig's Time

The documents on which my reconstruction mostly rests are preserved in the *Brandenburgische Landeshauptarchiv*. There is a dossier registered in the *Findbuch* as 'Promotionsregister der Artisten- bzw. Philosophischen Fakultät (1506-1596)'. The title can be misleading, since it includes much more information than one would expect from a 'Register of promotions in the faculty of arts or Philosophical Faculty'. It is a book in which the deans of the philosophical faculty annotated all important events connected with the teaching organization, and with activities taking place during the semester in which they held that office--assigned according to a rotation principle and approved through vote. Among such events, promotions of bachelors and masters of arts figure



prominently. Appointments of professors and related resolutions can be found, too. The records of orations and disputations include both *exercitationes* and *disputationes pro loco*, aimed at selecting suitable professors for the faculty. Thus, the book could aptly be called ‘Einträge der Dekane der philosophischen Fakultät’. Actually, in the seventeenth-century statutes of the philosophical faculty, it is described as *liber decanatus*<sup>22</sup>--and for the sake of brevity I will refer to it as *Deanship Records*.<sup>23</sup>

The annotations concerning the 1588 summer semester are an instance of extreme conciseness (figure 1). Caspar Hofmann, doctor of philosophy and medicine, was elected dean of the faculty on 19 April 1588. In one single page, he listed, in order of seniority, the names of seven students (with their respective origins) who had obtained the *baccalaureates*, and of six students who obtained the *magisterium* during his deanship. In the bottom of the page, he wrote the names of the examination commissions: five *examinatores* for the bachelor and five for the master degrees. The dean (*decanus*) presided over both boards--*Ioannes Craigus Scotus* figures as an examiner in both, as well.<sup>24</sup> On the basis of later, and still extant, statutes of the philosophical faculty (written in the 1640s), it can be concluded that it was a well-established practice for the examination commission to be composed of the dean and one representative of all of the four *nationes* (Franken, Brandenburg, Silesia and Prussia), to which professors had to be affiliated independently of their real origin.<sup>25</sup>

Not all semesters look so schematically straightforward. On some occasions emergency measures had to be taken, for example, if a dean fell ill or died--as happened in the summer semester of 1580, when the philosopher and physician Henricus Iaxmanus died. As one reads at the beginning of the entries relative to this period, Craig first

substituted him before another colleague Magister Matthäus Zeysius took over the position:

In the year of Christ 1580, on 16 April, the illustrious Doctor of Medicine and Philosophy, Henricus Iaxmanus, of the Silesian nation, has become dean of the Philosophical Faculty according to the prescribed forms and with the votes and consent of all. During his term, after a long consuming disease extinguished all of his bodily energies, he quietly died on 10 July, at the age of 51. Before his death, as he could not hold his office and the precedent dean was absent, he entrusted his post to the very learned Mr John Craig ad interim. Some disputations and declamations took place under him. Yet, after the dean's death, the Faculty Senior, in the name of the entire Collegium, consigned the dean's office to the earlier dean, Mr Magister Matthäus Zeysius, for the second time. He had just come back from his homeland and administrated the acts that follow.<sup>26</sup>

In that semester, the disputations and the examinations are registered in two different hands, making the deanship's handover recognisable.

The winter semester 1582/1583 and the ensuing summer semester were marked by intense rhetorical activities. At the beginning of the deanship of the professor of eloquence, Johannes Schosser, it was established by a large majority that all professors-- as well as those expecting a degree or a position (depending on the meaning of '*ii quos expectatus vocant*')--should dispute either in person or by a substitute (figure 2). The

reason is clearly stated: these exercises ‘full of dignity and usefulness’ should offer to students an example of conduct:

At the beginning of the deanship, most of the [professors of the] Philosophical Faculty decided that all of its members, professors as well as those said to be ‘waiting’ [for a position], held a disputation every year either in person or through a substitute of their choice. In this manner the studies are strengthened and the example of the elder encourages the young Masters to willingly undertake this kind of exercises (every wise person should know how decorous and useful they are).<sup>27</sup>

The series of disputations in that year was protracted, and Dean Schosser accurately reported their topics. Several were defended by Craig, either *for himself* or *for others*. On 8 December 1582, for instance, he disputed on the medical topic *de generibus simplicium morborum* (on the genres of simple diseases), in substitution of the dean (*pro Decano*).<sup>28</sup>

The next rector, Petrus Riander, professor of mathematics and Greek, reinforced the rhetorical bias of the academy. He appealed to the scholarly tradition--to the *maiores nostri in hac celeberrima Academia*--to justify his intention to accompany disputations with orations (figure 3). Every two disputations, he ordered, should be followed by an oratory *intermezzo*. The aim of such exercises, as one reads in his long explanation, was to prepare students through the Ciceronian art to accomplish important duties for the State and the Church:

Our ancestors rightly and usefully introduced disputations and declamations in this very famous Academy, just like in other well constituted ones, and have been preserved and propagated with great attentiveness [...].

Therefore, I see as my first task to ensure that the youth as well as the Masters cultivate these exercises with care and diligence. I believe that the most urgent issue is to restore the original and laudable consuetudes of our Academy, as much as it is possible. Accordingly, every two disputations should be followed by single declamations. Those who correctly exercised their disposition and capacity to dispute and speak about the most serious public and ecclesiastical matters were familiar with Cicero's art and the other very erudite authors.<sup>29</sup>

Rhetoric, thus, appears as an indispensable discipline for the education of a new class of clerics and statesmen.

The acknowledged importance of rhetoric highlights an essentially oral academic culture. Education itself was centred on disputations and orations. The path that led from such oral instruction--whose liveliness, regrettably, escapes the scrutiny of the historian--to the scriptural mode of modern academic culture was long and winding.<sup>30</sup> To be sure, the *deanship records* documents the centrality of oral practices and teaching methods at a late-humanistic university such as Frankfurt. There was more pressure on professors to appear on stage and embody in front of the students the ideals of rhetoric and argumentative ability, than to publish. Can this background account for the elusiveness of Craig's scientific production? His work appears as volatile as the oral culture he was part of. However, it is this discursive fluidity that needs to be first established and then given

its due attention, in order to understand one of the most important features of early-modern science.

#### IV Traces of Craig's Career at Frankfurt

The *deanship records* include considerable information concerning Craig's institutional life at Frankfurt. His name first appears in the summer semester of 1573 (figure 4). The dean, Matthäus Hostus, recorded his admission among the professors of the philosophical faculty (*ordo philosophicus*). Craig had to defend a disputation *pro loco*. Moreover, he was requested to provide evidence that he had already received a master's degree at another university:

In the year of the Lord 1623, on 18 April, Matthäus Hostus was elected dean according to the prescribed forms.

Under his administration John Craig the Scot has been admitted in the Philosophical Faculty after he held a disputation; he promised that he would certificate to the doctors and colleagues his Master's title within a certain time.<sup>31</sup>

At the bottom of the page a few lines were added, at a later date, attesting that the requested certificate--in the form of two documents--was furnished under the deanship of Johannes Schosser and the rectorate of Elias Camerarius in the winter semester of 1574:

He made this [i.e., consigned the requested documents] under M. Johannes Schlosser's deanship, that is, under M. Elias Camerarius' rectorate. He showed them two witnesses: one concerning his status and that of his parents, issued by the councillors and the Senate of his hometown, the other concerning his promotion at the University of Saint Andrew, issued by the University Rector and Dean.<sup>32</sup>

All that is left is Craig's enrolment in the matriculation register of Frankfurt on Oder. He matriculated in 1573, exempt of fees, perhaps because he was a foreigner--for the same exemption would be granted to his pupil, Liddel, several years later.<sup>33</sup>

Puzzlingly, Craig is described as '*d. med. Johannes Craigus Edenburgensis Scotus m*'.

The assignation of a medical degree must have been a later addition. He could hardly have accomplished medical studies in Scotland and become a *doctor medicinae*.

Moreover, in the *deanship records*, Craig is referred to as *Magister* up to the summer semester of 1580--following his receiving the degree of *medicinae doctor* from the University of Basel.<sup>34</sup> Thereafter he is referred to as *Doctor*--for instance in a series of disputations he defended in winter semester 1582. By then, the topics of his theses had changed as well. Whereas his earlier disputations centred on the mathematical sciences, particularly astronomy, a series of disputations he defended in 1582 centred on medicine.

Craig's appointment as professor of logic and mathematics was confirmed in inter semester 1575 under Urbanus Pierius, after he presented his certificates: 'M. John Craig the Scot was admitted to the Faculty Council on 10 April 1574 in common agreement'.<sup>35</sup> In summer semester 1574 Craig had defended two disputations--the topics of which are

not recorded--and he began serving as examiner. During the following years he proved himself an indefatigable disputer. In summer semester 1575, he became *professor ordinarius*. The relevant documents are preserved in the *Geheimes Staatsarchiv Preußischer Kulturbesitz* (Secret State Archives Prussian Cultural Heritage Foundation) of Berlin among the *Bestellungen... der Professorum in Facultate Philosophica* (professors' appointments in the Philosophical Faculty). It is an official letter by the 'Rector Magistri undt Doctores E. Churf. G[nädligste] Universitet daselbst' (Rector, Masters and Doctors of the Most Gracious Electoral University), sent from Frankfurt to the Brandenburg Chancellery on 7 June 1575.<sup>36</sup> They requested the confirmation of two promotions. Jodocus Willich had been chosen as the successor of Wolfgang Jobst for the chair of physics--and was awarded the requisite stipend--while John Craig was praised for the skills he had demonstrated as an *extraordinary* professor. The faculty stated that students had greatly benefited from his teaching and from his erudition (*Gelehrsamkeit*), particularly in philosophy. Thus, the faculty had elected him an *ordinary* professor, assigning him with the teaching of spherical astronomy, arithmetic, and logic (actually, the 'interpretation' of Aristotle's *Organon*). Accordingly, Craig's annual stipend of 40 florins would be more than doubled, by the addition of 50 fl. The electoral prince was asked to confirm the election of 'M. Craigum Scotum zum *ordinario professore Sphaerae, Arithmetices undt Organi Aristotelis*', as well as ratify the stipend's *augmentum*. The same dossier contains the letter of confirmation from the chancellery (12 July 1575).

In winter semester 1576/77 Craig was elected dean of the faculty:

In the year of the Redeemer of the human race 1577, on 12 October, in accordance with the statutes of the Philosophical Faculty and with the common consent and approval of the Senators of the Philosophical Order, the Professor of Mathematics and of Aristotle's *Organon*, M. John Craig of Edinburgh, Scot, of the Brandenburg nation, was elected and made dean of the Philosophical Faculty. Under his administration the following events took place.<sup>37</sup>

In that semester, Craig carefully recorded the events in his clear and meticulous handwriting (figure 5). He dutifully reported all the topics of the orations, declamations, and disputations--proving himself more diligent than many other deans. The disputations were divided into those held by bachelors, *magistri*, and *pro loco*. Three candidates, Ioachum Nizemius, Henricus Papebergensis, and Joannes Pontanus competed for a vacancy. The first disputed on rhetoric and logic (*De argutiis primis et primis ortis* and *De dialectica*); the second on ethics (*De virtute*); and Pontanus on *De iustitia et iure*. The position was eventually conferred on the latter.

The topics of the disputations during Craig's term of office attest to the influence exerted by the dean on the themes to be disputed. According to seventeenth century statutes, no *magister* could defend theses that had not been approved by the dean.<sup>38</sup> In the winter semester 1575/76, most disputations concerned astronomical topics, reflecting Craig's mathematical interests. Apart from one theological disputation, the other four bachelor disputations were astronomical:



Bachelor Paulus Veinart on the causes of the first apparition of the <Moon> from the <conjunction>

Idem, later, on the accidents of planetary motions explained through epicycles

Bachelor Martinus Stork on the lunar eclipse

Bachelor Jacob Kuno the younger on astronomy<sup>39</sup>

Among the *magistri*, Edo Hilderich disputed, *pro loco, De conversione annorum Iulianorum in Aegyptios* (on the conversion of the Julian years into Egyptian ones).<sup>40</sup> In contrast, purely oratorical exercises need not have pertained to mathematical astronomy: *Baccalaureatus* Nicolaus Pascha delivered an oration on Luther's life (*habuit Orationem de vita Lutheri*), and *Baccalaureatus* Paulus Veinart declaimed on the dignity of the Greek language (*De dignitate Graecae linguae declamavit*).

The professor of higher mathematics, Camerarius, died on 19 April 1581, after twenty years of service in the faculty. This death caused a one-day delay (to 20 April) of the titles' conferment to graduating students.<sup>41</sup> By a curious coincidence, the future astronomer, David Origanus, completed his studies on that very day. He would become the most reputed astronomer of the university, owing to his contribution to the construction of astronomical tables.<sup>42</sup> Camerarius' professorship was conferred on Jakob Bergemann.<sup>43</sup> Craig was not a candidate for that position, as he set his sights on the medical profession, which enjoyed higher social status and income.<sup>44</sup> The winter semester of 1582/83 proved particularly productive for him--not only as an author but as a public disputant. On 8 December he disputed, in the place of the dean, *de generibus simplicium morborum* (on the genres of simple diseases); on 9 March 1583 on *de*

*tumoribus praeter natura* (on unnatural tumours)--a disputation he repeated on 19 March in the place of Johannes Prueferus--and on 13 April on *de epilepsia* (on epilepsy), in the place of Johannes Prueferus. By this time, he enjoyed the title of *Doctor*.

Soon thereafter Craig left Frankfurt. This is evident by an entry from the next semester (winter semester 1583/1584), when a decision about his succession was taken:

The same day [8 April 1584] M. David Origanus was promised that he would occupy a chair in the Philosophical Faculty if Mr Scotus did not come back. M. Origanus' payment in Brandenburg florins was established [In the margin, in the hand of the next dean, Johannes Schosser: [Origanus] maintained the position later, as Mr Scotus did not come back].<sup>45</sup>

#### V Craig as a Circulator of Knowledge

Archival research grants access to the local, micro-historical, dimension of Craig's activity--at least to his institutional work at the philosophical faculty of the University of Frankfurt on Oder. In contrast, the international dimension is evinced from different sources. Correspondence is crucial for elucidating the communicative dimension of his scientific activity. Craig's five surviving letters, published as part of Brahe's correspondence, shed light on his mediating between Brahe and his patrons--the royal family of Scotland and, later, England. In so doing, Craig filled a function similar to that of other courtly experts--mathematicians and physicians--who were expected to advise on technical issues of all sorts.<sup>46</sup>

In May 1589 Craig informed Brahe about his recent *De mundi aethereis recentioribus phaenomenis* (1588):

At the beginning of the last Winter, the magnificent Sir D. William Stuart gave me your letter and the book that you sent him. As soon as I had them in my hands, I greedily read them and had great pleasure.<sup>47</sup>

Letters like this offered an opportunity to reinforce the communication network by drawing attention to common acquaintances. Craig, for example, mentioned Duncan Liddel, Paul Wittich, and other mathematicians when discussing the positions of comets. As noted above, Craig was a proponent of the Aristotelian meteorological doctrine of comets--against Brahe's determination of their location above the moon--for reasons that include the anti-astrological naturalization of such phenomena, and the belief in the existence of material celestial spheres.<sup>48</sup> Craig, like other scholars who frequented Dudith's Breslau circle, deemed--on ethical and religious grounds--the Aristotelian *natural* explanation of comets to be an antidote against astrological interpretation of comets. Alongside the meteorological view of comets, members of the circle endorsed the peripatetic doctrine of planets as moved by material spheres--a thesis that was compatible with the Copernican theory, but not with Brahe's geo-heliocentric system. As a matter of fact, the explanation of planetary motions became a heated topic at the end of the sixteenth century and at the beginning of the seventeenth century, as the dissolution of the celestial spheres called for an alternative explanation, such as the one offered by Kepler's *celestial physics*.<sup>49</sup>

Despite their diverging opinions, decorum was at first preserved. On 15 October 1589, Brahe avowed that he would always grant Craig a place in his *album amicorum*:

I am very thankful to you for your unique benevolence and candid judgement. I will continue to correspond your esteem maintaining your name in the album of my most singular friends, to cultivate our friendship, which began with epistolary exchanges, and guard it through other letters whenever the occasion comes.<sup>50</sup>

Astronomy, though most prominent, was not the only topic of discussion. On 28 February 1590 Craig expressed interest in Brahe's alchemical experiments: 'If you found anything singular in chemistry, which you judge worth communicating to a friend, please do'.<sup>51</sup> Further reading of the correspondence helps reconstruct some of Craig's other scholarly ties. Brahe exchanged letters with other English and Scottish men, including Thomas Craig, who expressed gratitude for Brahe's generous mention of him in a letter addressed to Peter Young, the king's counsellor.<sup>52</sup> Brahe reciprocated with an Ovidian elegy:

I clearly see from the verses that you composed with so much grace that you are well endowed with a refined poetic talent. Hence, I decided to add an elegiac epistle, written in imitation of Ovid, that I have recently been inspired by the name of a sister. In this manner you will see that I do not always treat sublime and heavenly matters but also matters more common to the mortals.<sup>53</sup>

Nevertheless, the peregrinations of a travelling scholar could prove difficult and hinder the effectiveness of one's scientific activity. John Craig apologized to Tycho in May 1589 for his delayed reaction to the latter's *Apology* on the superlunary location of comets. He also excused the insufficient depth of his reply adducing that he had been busy with travels between England and Scotland, which denied him the necessary *otium literarum*. He would have devoted his 'spare time' to heavenly subjects:

Eventually, I come to your letter, to which I will have answered more rapidly, if the steady peregrinations since the beginning of February allowed me to stay at home at least for one day. After I came back from England, a few days ago, I had some spare time to read and ponder your writing, although not in the manner I wished. In fact, if I had more time, I would try [*experiri*] to calculate whether I can bring comets down to the birthplace among the Aristotelian vapours. Yet, for that purpose more time is needed and more records. For the time being, owing to the present occupations, I will be concise.<sup>54</sup>

## VI Concluding Remarks and Prospects for Further Research

Craig's activity in Scotland and his ties with England--the scientific and cultural connections he built there before and after his patron James's ascension to the throne--is a chapter that remains to be written. Additional research in university archives is required in order to cull information concerning Craig's enrolment at Basle and Oxford. In the present essay I have explored Craig's institutional life at Frankfurt on Oder based on

archival evidence and, particularly, on the *liber decanatus* preserved in the Brandenburg Main State Archive of Potsdam. The deanship register offers us an insight into the oral culture of an early-modern Protestant university, in which the regular exercise of rational and rhetorical skills through disputations and orations was regarded as fundamental. It aimed at forging new generation of civil and ecclesiastical servants. Publications counted less, as the discrepancy between Craig's zeal as a disputer and the lack of publications attest. His scientific stature rather emerges from epistles. Later exchanges (and polemics) between him and Brahe on comets, mathematical astronomy, and heavenly physics are known to the historians of Renaissance astronomy. By the 1580s, Craig was an acknowledged mathematician and physician. He was known across Protestant Germany, not only at Frankfurt where he had taught, but also at Helmstedt where his pupil Liddel was a renowned professor. Moreover, Craig developed close ties with the Scottish court--and possibly with English scholars as well--even before the unification of the two kingdoms, as is suggested by the above-mentioned letter to Brahe (May 1589). Craig had also gravitated toward the influential Breslau circle of Dudith. Brahe, therefore, had good reasons to be concerned about Craig's criticism of his theories.

Shedding new light on Craig's little-known period of his life helps elucidate how and why he had earned his reputation at Frankfurt. Documentary evidence demonstrates his diligence as a teacher, as well as his academic offices. With the benefit of hindsight, his Frankfurt years could be seen as the time in which he laid the foundations of his science and reputation. In this perspective, the exploration of the academic micro-context at Frankfurt helps construe more general conclusions concerning the significance of reconstructing institutional backgrounds and wider patterns of knowledge circulation in

early modern Europe. Furthermore, such exploration helps establish the institutional networks of academies and cultural centres that existed in a wide northern *résau*, which created a space for the circulation of individuals and ideas, and helped constitute the northern European Republic of Letters.

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<sup>1</sup> Cf. David S. Lux and Harold J. Cook, 'Closed Circles or Open Networks? Communicating at a Distance during the Scientific Revolution,' *History of Science* 36 (1998), 179-211.

<sup>2</sup> Pietro Daniel Omodeo and Enrico Pasini, *Erasmian Science: The Influence of Erasmus of Rotterdam on Early-Modern Science*, a special issue of the *Journal of Interdisciplinary History of Ideas* 6/2 (2014). On scholarly networks and confessional divides, cf. Martin Mulsow, 'Netzwerke gegen Netzwerke: Polemik und Wissensproduktion im politischen Antiquarianismus um 1600,' in idem, *Die unanständige Gelehrtenrepublik: Wissen, Libertinage und Kommunikation in der Frühen Neuzeit* (Stuttgart-Weimar, 2007), 143–190.

<sup>3</sup> James A. Secord, 'Knowledge in Transit,' *Isis* 95/4 (2004), 654-672.

<sup>4</sup> John Craig, *Capnuraniae restinctio seu cometarum in aethera sublimationis refutatio* [1591], in Tycho Brahe, *Opera omnia*, ed. by John Louis Emil Dreyer [1913–1929] (Amsterdam, 1972), vol. 4, 477-488. Also, several letters of his correspondence with Brahe are extant. Cf. Brahe *Opera omnia*, vol. 7.

<sup>5</sup> Mordechai Feingold, 'Confabulatory Life,' in *Duncan Liddel (1561–1613), Networks of Polymathy and the Northern European Renaissance*, ed. Pietro Daniel Omodeo with Karin Friedrich (Leiden, 2016), 22–34.

<sup>6</sup> Jennifer M. Rampling, 'John Dee and the Sciences: Early Modern Networks of Knowledge,' *Studies in History and Philosophy of Science* 43/3 (2012), 432–436 and Stephen Pumfrey, 'John Dee: The Patronage of a Natural Philosopher in Tudor England,' *Studies in History and Philosophy of Science* 43/3 (2012), 449–459.

<sup>7</sup> Gilbert Gray, *In Memoriam Cl. Viri Duncani Liddellii* ([Edinburgh]: excudebat Andreas Hart bibliopola, 1614), f. Dr: 'Sic cum Francofortum ad Oderam, studiorum gratia, divertisset Liddelius, consilii et auxilii inops, reperit in summa gratia et honore popularem suum clarissimum Doctorem Iohannem Cragium, nunc Regis nostri potentissimi archiatrum, publica ibidem tunc matheseos et logicae professione ornatum: cuius non schola modo, sed mensa liberaliter est usus, diligenterque ab eodem in iis, quae maxime amabat, studiis edoctus et educatus.'

<sup>8</sup> Cf. Omodeo, 'The European Career of a Scottish Mathematician and Physician,' in *Duncan Liddel..., Networks of Polymathy and the Northern European Renaissance*, 35–92, esp. 41–42.

<sup>9</sup> *Ibid.*, 87–88. Cf. Peter John Anderson (ed.), *Fasti Academiae Mariscallanae Aberdonensis: Selection from the Records of the Marischal College and University* (Aberdeen, 1889–1898), vol. 1, doc. 16 and 17.

<sup>10</sup> However, while Scottish scholars routinely studied and graduated on the continent, English students often completed their course of study in England before heading to the Continent.

<sup>11</sup> Feingold, *The Mathematicians' Apprenticeship: Science, Universities and Society in England, 1560–1640* (Cambridge, 1984), 25 and 32.

<sup>12</sup> John Henry, 'Craig, John,' in *Oxford Dictionary of National Biography* (Oxford, 2004–2016), *sub voce*.

<sup>13</sup> See Leslie Dodd, 'Thomas Craig's Aetiology of Law and Society,' *Journal of Legal History* 37/2 (2016), 121–179 and David McOmish, 'Not Just a Lawyer: Thomas Craig and humanist Edinburgh,' *Innes Review* 67/2 (2016), 93–106.

<sup>14</sup> T.C., 'Craig, John,' *The Dictionary of National Biography* (Oxford: Oxford University Press, 1993), vol. IV, *sub voce*, 1374b–1375a.

<sup>15</sup> Henry, 'Craig, John,' Scots were foreigners or aliens in England; such a status remained unchanged until the 1707 act of union, despite James's attempts to integrate the two nations a century earlier.

<sup>16</sup> *Ibid.* It is now well established that Craig and Napier were related and collaborators. Cf. McOmish, 'A Community of Scholarship,' in *Neo-Latin Literature and Literary Culture in Early Modern Scotland*, ed by Steven J. Reid and McOmish (Leiden: Brill, 2016), 58–61.

<sup>17</sup> Adam Mosley, 'Tycho Brahe and John Craig: The Dynamic of a Dispute.' In *Tycho Brahe and Prague: Crossroads of European Science*, ed. by John Robert Christianson et al. (Frankfurt a.M., 2002), 70–83.

<sup>18</sup> Craig to Brahe (Edinburgh, 9 July 1589), in Brahe, *Opera omnia*, vol. 7, 193: 'In tua hypothesi non alienum videtur, quod Terra luminarium et Sol caeterorum planetarum sit centrum, sed tamen absurdum implicat, quod Mars acronychus Terris proprius fiat Sole; concinnior fortasse erit, si punctum Terrae vicinius quam Sol statuatur centrum, aut si id nolis, ut duplici epicyclo augeatur orbis planetae superioris, quemadmodum ad me suam ea de re cantationem scripsit M. Duncanus Liddelius; quae quidem hypothesis nihil absurdi habebit; nam non solum hoc tuum vitabitur, sed etiam orbis planetis ascribi poterunt. Sunt et plures modi, quibus ita supponi possunt, et ipse aliquando exponam, quid hac de re sentiam, plenius, omnino enim incumbendum statuo, ut physicis et mathematicis pariter satisfiat.'

<sup>19</sup> Cf. Owen Gingerich and James R. Voelkel, 'Tycho Brahe's Copernican Campaign,' *Journal for the History of Astronomy* 29/1 (1998), 1–34 and Ann Blair, 'Tycho Brahe's Critique of Copernicus and the Copernican System,' in *Journal of the History of Ideas* 51/3 (1990), 355–377.

<sup>20</sup> The literature on the subject is wide. See among others the seminal work by Clarisse Doris Hellman, *The Comet of 1577: Its Place in the History of Astronomy* (New York, 1944). Also see Christoph Meinel and Bernhard Lübbes (ed.), *Grenzgänger zwischen Himmel und Erde: Kometen in der Frühen Neuzeit* (Regensburg, 2009).

<sup>21</sup> See Omodeo and Jonathan Regier, 'Liddel on the Geo-heliocentric Controversy: His Letter to Brahe from 1600,' in *Duncan Liddel..., Networks of Polymathy and the Northern European Renaissance*, 203–217.

<sup>22</sup> Paul Reh (ed.), *Statuta facultatis philosophicae in academia Francofurtana*, in *Die Fakultätsstatuten und Ergänzungen zu den allgemeinen Statuten der Universität Frankfurt a.O.* (Breslau, 1900), 16–30, III 1, 18.

<sup>23</sup> The collocation here follows: *Brandenburgische Landeshauptarchiv* (Potsdam), Rep. 86 Universität Frankfurt an der Oder, Nr. 26. From now onwards I will refer to it as *Deanship Records*.



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<sup>24</sup> *Deanship Records*, f. 96v.

<sup>25</sup> Reh, *Statuta facultatis philosophicae* III 16, 22: ‘*De numero Examinatorum*: Examinatores regulariter sunt 5, nempe praeter decanum ex qualibet natione unus.’

<sup>26</sup> *Ibid.*, f. 99v: ‘Anno Christi MDLXXX die Aprilis 16 ex natione Silesica, rite omniumque suffragiis ac consensu creatus est Ordinis Philosophicis Decanus Ill. Henricus Iaxmanus artis Medicae et Philosophiae Doctor, qui sub hoc Magistratu postquam diuturno morbo tabisico vires corporis universa consumpta essent, placide obiit 10 die Juli, anno aetatis sua 51. Cum ipse ante mortem propter abducosam Valetudinem officio suo praeesse non posset, absente etiam praecedente Decano, vices interim suas commisit doctissimo Viro Domino Magistro Johann Crayg sub quo aliquot disputationes, declamationes habitae sunt. Sed post obitum ipsius Decani, Senior facultatis, nomine totius Collegii munus Decani iterum demandavit Domino Magistro Matthaeo Zeysio, praecedenti Decano, qui ex patria modo reversus erat hoc denuo administravit, haec acta quae sequuntur.’

<sup>27</sup> *Ibid.*, f. 104v: ‘In principio Decanatus, decretum est a maxima facultatis Philosophicae parte, ut singuli in ipsa existentes, tam professores, quam ii quos expectatus vocant, singulis quotannis vel ipsimet habeant disputationes, vel per alios a se conductos habendus curent: quo magis et studiis discendum consulatur, et iuniores Magistri exempla seniorum incitati, huiusmodi exercitia (in quibus multum inesse et dignitatis et utilitatis omnes savi intelligunt) tractent libentius.’

<sup>28</sup> *Ibid.* f. 105r.

<sup>29</sup> *Ibid.*, ff. 108r-v: ‘A Maioribus nostris in hanc celeberrimam Academiam, sicut in alias bene constitutas recte et utiliter disputationes et declamationes introductas, ni hunc usque diem summo studio conservatas et propagatas esse Apollinis oraculo verius P.

Quapropter ante omnia faciendum mihi putavi, ut haec exercitia sedulo et diligenter tam a Iunioribus quam Magistris, colerentur: Maxime vero in id unice incumbendum esse censi, ut quatenus quidem fieri potuit, pristinam et laudabilem Academiae nostrae consuetudinem revocarem qua post binas disputationes, singula declamationes sunt recitatae. Hoc enim pacto qui recte exercentur habitum et facultatem de rebus gravibus in Republica et Ecclesia disserendi et dicendi sibi parare consueverunt autoribus Arte Cicerone et coeteris eruditissimis quibusque.’

<sup>30</sup> See Ku-Ming Chang, ‘From Oral Disputation to Written Text: The Transformation of the Dissertation in Early Modern Europe,’ *History of Universities* 19/2 (2004), 129-187 and Gerhard Wiesenfeldt, ‘Academic writings and the rituals of early modern universities,’ *Intellectual History Review* 26/4 (2016), 447-460.

<sup>31</sup> *Deanship Records*, f. 82r: ‘Anno domini MDLXXIII rite electus est Decanus VI Matthaeus Hostus adhuc rector XVIII Aprilis.

Sub cuius administratione in ordinem Philosophicum admissus est Johannes Cragius Scotus habita disputatione, is promisit intra certum tempus se doctorum et collegas certiores facturum de sua magisterii promotione.’

<sup>32</sup> *Ibid.*: ‘Quod fecit Decano M. Ioan. Schlosero, ut deinde Rectore M Elia Cameriaro: quib. duobus bina testimonia monstravit, verum de statu suo et parentum, a Consulib. et Senatu patriae acceptum: alterum de promotione sua in Academia Andreapolitana ab eius Academiae Rectore et Decano transmissis.’

<sup>33</sup> Brandenburgisches Landeshauptarchiv, Potsdam, Rep. 86 Universität Frankfurt an der Oder, Nr. 56, f. 219r. Cf. Ernst Friedlaender (ed.), *Ältere Universitäts-Matrikeln*, I. Universität Frankfurt a. O. (1506-1648) (Osnabrück, 1965), 228.

<sup>34</sup> The reasons for travelling that far for the degree await further research.

<sup>35</sup> *Deanship Records*, f. 83r.: ‘M. Johannes Cragius Scotus communis consensu receptus est ad concilium facultatis 10 April. Anno ’74.’

<sup>36</sup> Geheimes Staatsarchiv Preußischer Kulturbesitz, I HA GR Rep. 51, *Bestellungen... der Professorum in Facultate Philosophica*.

<sup>37</sup> *Deanship Records*, f. 95r: ‘Anno Redemptoris humanis Generis Septuagesimo septimo supra sesquimillesimum, Die 12 Octobris, Secundum Collegi Philosophici statuta, communi Senatorum Philosophici ordinis consensu et sententia electus et creatus est ex natione Marchica Decanus Collegij Philosophici M. Ioannes Craigus Edinburgensis, Scotus Mathematicum et Organi Aristotelis Professor. Sub cuius administratione quae sequuntur gesta sunt.’

<sup>38</sup> Reh, *Statuta facultatis philosophicae* III 9.

<sup>39</sup> *Deanship Records*, f. 95r.

<sup>40</sup> *Ibid.*: ‘Baccal. Paulus Veinart de causis prius apparitionis <Lunae> a <coniunctio> Idem postea, de accidentibus motus Planetarum <per> Epicyclum explicatis

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Baccal. Martinus Stork de Luna Eclipsi

Baccal. Iacobus Kuno Iunior de Astronomia.’

<sup>41</sup> Normally, the deans were elected twice each year, on the Saturday before the festivities of Saint George (19 April) and of St. Gall (16 October) (Reh, *Statuta* I 1). Students’ promotions took place at the end of a dean’s mandate, ‘nempe circa d. Georgii et Galli festum’ (Reh, *Statuta* III 21).

<sup>42</sup> *Deanship Records*, f. 101r. On Origanus, see Omodeo, ‘David Origanus’s Planetary System (1599 and 1609),’ *Journal for the History of Astronomy* 42/4 (2011), 439-454.

<sup>43</sup> *Deanship Records*, f. 102r.

<sup>44</sup> John Henry, ‘‘Mathematics Made No Contribution to the Public Weal’’: Why Jean Fernel Became a Physician.’ *Centaurus* 53/3 (2011), 193–220.

<sup>45</sup> *Deanship Records*, f. 114r.

<sup>46</sup> For a famous parallel case, see the introduction to *Christoph Rothmann’s Discourse on the Comet of 1585*, ed. by Miguel Ángel Granada, Adam Mosley and Nicholas Jardine (Leiden-Boston, 2014).

<sup>47</sup> Craig to Brahe (Mai 1589), in Brahe *Opera*, vol. 7, 175-182, 175: ‘Sub praeteritae hyemis initium, vir magnificus, D. Guilhelmus Stuartus, mihi literas tuas et librum quem misisti, reddidit, quibus, ut in manus meas venere, avide perlectis, delectatus sum plurimum.’

<sup>48</sup> Cf. Granada, *Sfere solide e cielo fluido: Momenti del dibattito cosmologico nella seconda metà del Cinquecento* (Milano, 2002).

<sup>49</sup> *Idem*, ‘‘A quo moventur planetae?’’ Kepler et la question de l’agent du mouvement planétaire après la disparition des orbes solides,’ in *Galilaeana* 7 (2010), 111-141. On related issues also see my essay ‘The ‘Impiety’ of Kepler’s Shift from Mathematical Astronomy to Celestial Physics,’ *Annalen der Physik* (2015), A71-A75.

<sup>50</sup> Brahe, *Opera omnia*, vol. VII, 195: ‘Pro singulari illa tua erga me meaque studia benevolentia et candido iudicio plurimas tibi habeo gratias, et vicissim te diligere atque in albo amicorum meorum singularium numerare non intermittam, nec non amicitiam semel per literas inchoatam postea continuare et crebra scriptione, quoties occasio datur [...] conservare.’

<sup>51</sup> *Ibid.*, 242: ‘Si quid singularis in chymicis habueris, quod putes amico communicandum, facias velim.’

<sup>52</sup> Thomas Craig to Brahe (1594), *ibid.*, 364-365.

<sup>53</sup> Brahe to T. Craig (Uraniburg, 26 July 1594), *ibid.* 365-366, 366: ‘Cum autem eleganti poetica vena te praeditum esse ex versibus eiusmodi gratia conscriptis non obscure perspexerim, Epistolam hanc Elegiacam ad imitationem Ovidianarum nupere animi causa sororis nomine a me lusam adiungere volui, ut videas me non semper sublimia et coelestia, sed etiam terricolis, ut plurimum, usitata nonnunquam [...] tractare.’

<sup>54</sup> J. Craig to Brahe (May 1589), *ibid.*, 176: ‘Sed ad literas tuas nunc veniam, quibus citius respondissem, nisi continuae perigraciones nostrae ab initio Februarii vix unum diem domi esse concessissent. Ex Anglia ante paucos dies domum reversus, nonnihil otii sum nactus ad tua relegenda et iterum expendenda; nec tamen ut cuperem. Nam si reliqua suppeterent, experiri vellem, an Cometas iterum numeris possem coelo deducere in nativum suum locum inter Aristotelis fumositates. Sed hoc alterius erit otii et maioris earum rerum recordationis. Nunc pro praesenti occasione, quantum occupationes permittent, paucis rescribam.’