

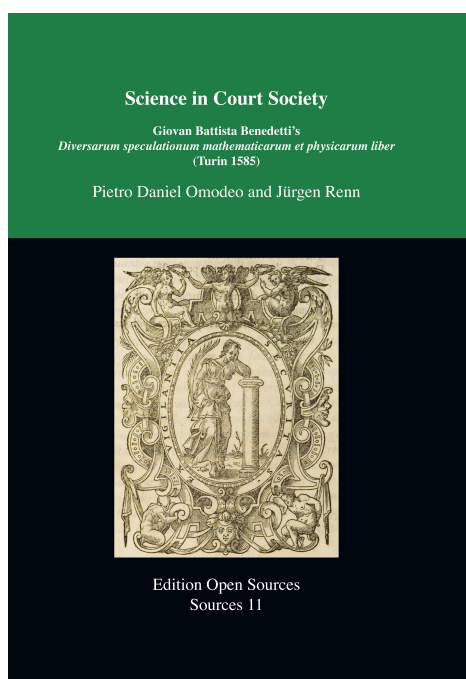
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Sources 11

Pietro Daniel Omodeo and Jürgen Renn:

The Subalpine Environment

DOI: 10.34663/9783945561485-03



In: Pietro Daniel Omodeo and Jürgen Renn: *Science in Court Society : Giovan Battista Benedetti's <i>Diversarum speculationum mathematicarum et physicarum liber</i> (Turin, 1585)*

Online version at <https://edition-open-sources.org/sources/11/>

ISBN 978-3-945561-16-4, DOI 10.34663/9783945561485-00

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The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>

Chapter 2

The Subalpine Environment

Benedetti's life, work, and reception are indissolubly linked to Turin and the Duchy of Savoy. As one reads in the *Diversae speculationes*, he chose to live in this town until the end of his life. There he benefited from the patronage of Duke Emanuele Filiberto (Figure 2.1) and, as a consequence, from a prominent social position and recognition. In the dedicatory epistle of his major work, addressed to Filiberto's successor, Carlo Emanuele I, Benedetti extolled the merits of the deceased duke, who had invited him to Turin almost two decades earlier:

Nineteen years have passed since I was sent for by a letter of the most serene [Emanuele Filiberto] father of Your Highness [Carlo Emanuele I] and I moved from the town Parma to this municipality. Upon my arrival, he received me so humanely, and later I met with so much generosity as a reward for my services, that I began to desire vehemently that I could spend the rest of my life under his authority.¹

As one reads, Benedetti and Emanuele Filiberto were so close that the patron even wanted his court mathematician to accompany him during his periods of residence in the countryside. On such occasions they often discussed scientific matters:

His benevolence toward me, as well as my respect toward him, consolidated through the time we spent together, and our familiarity [grew] to the point that the duke wanted me to accompany him when he resided in the countryside. [He] often [even invited me] to stay with him overnight. In that time he discussed mathematics with me. He used my work in order to learn those sciences, asking questions on arithmetic, geometry, optics, music and astronomy [*astrologia*].²

Emanuele Filiberto's passion for mathematics was well known in his day. The Venetian ambassador to Turin, Giovanni Correr, reported on this singular aspect of his personality in 1566:

That Duke is no man of letters but he loves the virtuosi. Hence, he has many of them by him; he likes to listen to their reasoning and he asks them questions. However, there is no subject that delights him more than mathematics, as

¹Benedetti 1585, f. A2r: "Agitur nonus decimus annus ex quo litteris Serenissimi patris tuae Celsitudinis, accersitus ex urbe Parmensi in hanc me civitatem contuli. Is advenientem tam humane excepit, tanta deinde liberalitate fuit complexus ego vicissim ei deserviendi, tam vehementi cupiditate fui accensus, ut sub eius ditione quod superesset vitae agere constituerem."

²Benedetti 1585, f. A2r: "Cuius in me banignitas, mea in illum observantia mirum in modum mutuo usu, et consuetudine est adaucta, ut idem Dux me secum dum rusticaretur esse vellet, saepe etiam secum pernoctare; quo quidem tempore de Mathematicis scientiis mecum agebat, in quibus perdiscendis mea opera utebatur, quaestiones, Arithmetica, Geometria, Optica, Musica, aut Astrologia spectantes proponens."

this science is not only apt but also necessary to the profession of military commander.³



Figure 2.1: Portrait of Emanuele Filiberto from Tonso, *De vita Emmanuelis Philiberti* (1596). (Biblioteca Nazionale Universitaria di Torino)

The duke's passion for science and his special relation with his court mathematician is further confirmed by the Venetian ambassador Giovanni Francesco Morosini, who mentioned Benedetti in a speech delivered to the Senators of Venice in 1570:

The duke of Savoy has a wonderful mind apt to every kind of science. However, he did not learn the sciences [*le lettere*] with the diligence that is necessary to become an expert, as his passion has always been the profession of

³Firpo 1983, 123: “Non è quel duca litterato, ma ama li virtuosi, et però ne tiene alquanti appresso di sé, sente piacere a udarli ragionare, egli stesso li fa de quesiti, ma nessun ragionamento più li diletta, che quello delle matematiche, come scientia, che non solo è conveniente ma ancora è necessaria alla professione del capitano.”

war [...]. But since mathematics is very useful and [even] necessary to professional warfare, His Excellency [Emanuele Filiberto] learns [mathematics] with much pleasure and knows more of it than the average man. He is aware that to receive substantial knowledge in any science one has to be in contact with it and learn it continuously; therefore a certain Mr. Giovanni Battista Benedetti of Venice imparts to him a lesson either on Euclid or on another writer of those sciences every day. In my opinion, as well as according to many other gentlemen, he is the most excellent scholar in this discipline in our times. The duke likes him very much. In fact, not only has [Benedetti] mastered this science, but he is also able to transmit it very well to others in his lessons.⁴

However, Benedetti's activities in Turin cannot be fully grasped if we limit our consideration to his relationship with the dukes. Rather, we should consider the wider political and cultural environment in which this relationship was established.

2.1 Turin's Economy and Politics between Italy and Europe

From the point of view of economic exchanges as well as of the European balance of power, Turin was located in a delicate and strategic position. It was in fact an obligatory station on the commercial road connecting Italy and France through the *Val di Susa*. For many centuries it had served as a transit point for merchants from Liguria, Lombardy, and Piedmont on their way to Lyon and the French and Flemish markets, and vice versa. Merchants were not the only visitors, as scholars from France, Flanders, and the British Islands began their *iter Italicum* from Turin. Turin was also the first station in Italy of Erasmus of Rotterdam, a key figure of the European Renaissance. On that occasion, on September 4, 1506, he received an "Italian" degree in theology from the University of Turin.

Its intermediate position between Italy and France made the town relevant not only from the point of view of economics and culture but also for military reasons. When Francis I of France and Charles V of Spain fought over Italian and European supremacy, Turin acquired fundamental strategic importance. The French army conquered it in 1536, together with most of Savoy and Piedmont, at the expense of Charles II of Savoy, brother in law to Charles V of Spain. The King of France made Turin the most important center in the region and a bulwark that was fundamental for consolidating his position on the Italian peninsula. Some of the political and administrative reforms promulgated by the new ruler were long-lasting. The most important of them were the creation of a parliament and of a *Camera dei Conti* for the supervision of public finances.⁵

⁴Firpo 1983, 211: "Ha il signor duca di Savoia un bellissimo ingegno capace d'ogni scienza: ma non ha atteso alle lettere con quella diligenza, che si converria a chi ne volesse sapere, essendo la sua principal professione il mestiero della guerra [...]. E perché la scienza delle matematiche è molto utile e necessaria a chi vuole fare questa professione de l'arme, però se ne diletta assai Sua Eccellenza [Emanuele Filiberto] e di quella sa assai più che mediocrementemente. Con tutto questo sapendo che l'uomo tanto sa di ogni scienza quanto continua in vederla e studiarla, però usa di udire ogni giorno una lezione o d'Euclide o d'altro scrittore di quelle scienze da un messer Giovan Battista Benedetti veneto; uomo, per opinione non solamente mia, ma di molti valentuomini ancora, il maggiore che oggi faccia professione, e di grandissimo gusto del Signor Duca; perché oltre a possedere lui quella scienza eccellentissima sa anco così bene insegnarla ad altri che con molta facilità ne fa restar capacissimo chi lo ascolta."

⁵Merlin 1998, 16.

Emanuele Filiberto, known as “testa di ferro” for his energy and capacity in military affairs, retook Turin on the battlefields. He conducted the campaign against the French as a captain in the service of the Habsburgs. In 1553 he was the supreme commander of Charles V’s imperial army in Flanders and was nominated governor of the Netherlands by Philip II in 1556. His victory in the battle of Saint-Quentin led to the Peace of Cateau-Cambrésis (1559), according to which the Savoy and Piedmontese territories had to be restored. The French agreed to give them back to the dukes of Savoy with the significant exception of five fortified towns, occupied by their troops.

Turin was one of them. Therefore, it took some years before it was eventually returned to Emanuele Filiberto in 1562. In 1563 the duke entered the town and choose it as the new capital of his duchy instead of Chambéry. In this manner, he conferred an Italian identity to his duchy. This transfer set in motion political, social, and economic transformations, which were still in progress when Benedetti arrived in Turin in 1567. Moreover, the Piedmontese territories were politically fragmented. Apart from the centers under French control (Chieri, Pinerolo, Chivasso, and Villanova d’Asti), the region included the *Marchesati* of Monferrato and of Saluzzo. Moreover, the county of Tenda, connecting Piedmont with the Savoy possession of Nice, was an imperial fief. As for Geneva, a former possession of Savoy, it had become the “Jerusalem” of the Calvinists and would never be regained.

Within this difficult territorial and political constellation it was imperative that Emanuele Filiberto reestablish his authority after years of wars and foreign domination. In the European context, this meant striking a balance between the interests of Spain and France, who both wanted to annex the territories of the duchy either as a part of France or as a continuation of the Milanese territories. Piedmont was already split into a faction favorable to the French and one favorable to the Spaniards during the years of the war, and this division would also continue during the reigns of Emanuele Filiberto and Carlo Emanuele I.⁶

International diplomacy was comprised of marriage politics. Emanuele Filiberto received a French spouse, Margret of Valoys, daughter of Francis I of France and sister of King Henry II. This meant a strong political and cultural link to Paris. Margret was well known for her patronage of literati and artists, among them the poets of the Pléiade, Pierre de Ronsard, and Joachim Du Bellay. However, her son Carlo Emanuele I married a Habsburg, the daughter of Philip II of Spain, *infanta* Catherine Michelle, who arrived in Turin in 1585. This liaison was strongly encouraged by the pro-Spain party. Its leader was Andrea Provana of Leynì (1511–1592), with whom Benedetti was well acquainted. Four of the letters included in the epistolary of the *Diversae speculationes* are addressed to him. Benedetti judged the importance of his correspondence with this exponent of the Savoy aristocracy to be second only to those with Emanuele Filiberto (first epistle of his collection) and Carlo Emanuele I (second epistle). We can assume, taking his origins as a guide, that Benedetti supported Provana’s pro-Spain party.

In his relations to other Italian States the duke also followed a politics of balance. He was particularly keen on having good relations with Venice, which he visited in 1566 and 1574. On the latter occasion he was even endowed with the title of *patrizio* of the town. In turn, a Venetian embassy was established in Turin. The Savoy relation with Rome was also cordial. The papacy regarded Turin as a bulwark to stop the dissemination of reformed ideas in Italy, especially from the Swiss cantons. For his part, Emanuele Filiberto saw “heresy” as a danger to the unity of his state and his authority. Therefore, on

⁶Merlin 1998, 33 and Merlin and Stango 1998, 266–267.



Figure 2.2: Portrait of Carlo Emanuele I by Francesco Maria Ferrero di Labriano, *Augustae Regiaeque Sabaudae Domus Arbor Gentilitia* (Turin, 1702), p. 174. (Biblioteca Nazionale Universitaria di Torino)

matters of faith, the Roman interests and his own converged. Against the background of the confessional tensions of those years, his support for the Jesuits is comprehensible. Yet he was no fanatic of orthodoxy. He was influenced by the Imperial policy of mediation, as is shown by his ratification of a compromise with the Valdesans in 1561, in which he accorded to them religious freedom in their valleys.

The ties with Rome and Venice were reinforced through Savoy support for expeditions against the Turks. In 1565 Andrea Provana was sent with three galleys to Malta, as the court historian Pingone recounted in his history of Turin, *Augusta Taurinorum*:

When Malta was besieged by the Turks, in June 1565, duke Emanuele [Filiberto] sent Andrea Provana of Leini with four well-equipped triremes to bring supplies to the isle together with triremes from the Pope, Spain, and other [states]. First, Provana [*Leniacus*] arrived and assessed the difficulties. Then, he conveyed others [to the battle] and broke the siege with divine favor. The holy and vigorous order of the knights of Jerusalem was liberated under the superior command of the French Jean of Valetta. Public demonstrations of

immense joy and pious celebrations of thanks to God for the victory were displayed in Turin.⁷

In 1571 Provana was enlisted to defend Cyprus and contributed to the “holy” victory in the battle of Lepanto.

In 1571, when duke Emanuele [Filiberto] ruled over Turin and a confederation was established between Pope Pius V, the king of Spain and the Venetian Republic, he was asked to command the fleet with everybody’s agreement. But he had to renounce the offer owing to the present danger to his country engendered by local conflicts. [In his place] John of Austria, offspring of emperor Charles V, of great spirit and promising youth, was made commander. Chief Andrea Provana of Leyn  joined this expedition with three triremes. It was fought near Nauplia with the support of the Greeks. The Christians had hardly two hundred triremes and the Ottomans more than three hundred. The battle [*Mars*] was undecided for a long time but finally victory was given to the Christians, with the favor of God or even as a miracle. Provana, who fought bravely in the commanding trireme, was hit by a gun bullet and could hardly escape under the protection of a galley. One of the [Savoy] triremes, named Margara, was scattered and sunk into the depth; [another one], Pedemontana, was saved many times from the enemy. That victory was celebrated in Turin with thanks given to God and holy days set aside for the people.⁸

On these occasions Benedetti served as an advisor to Provana. Three of the four epistles of the *Diversae speculationes* addressed to him deal with mathematical issues related to navigation. As one reads, Benedetti undertook to give Provana suggestions concerning navigation and the employment of navigational instruments.⁹ The first epistle is entitled *Per eundem parallelum absque correctione semper navigari non posse ubi notantur Petri Nonii lapsus in correctione erroris navis et alii Petri Medinae errores* (That one cannot always navigate along the same parallel without correction, where an error by Petrus Nonius concerning the correction of the deviation of a ship and other [errors] by Petrus Medina are considered). The second and the third letter deal with a navigation instrument invented by Benedetti based upon the design of Gerardus Mercator (Figure 2.3). They are a description of the instrument accompanied by technical drawings and an explanation of its use. They

⁷Pingone 1577, 85: “Anno Christi 1565 mense Iunio, Dux Emanuel, obsessa a Turcis Melita, Andream Provanam Leniacum cum triremibus quatuor instructissimis mittit, qui una cum Pontificiis, Hispanis et aliis triremibus suppetias insulae afferret. Prior Leniacus applicuit, difficultates exploravit, alios postea advexit, et soluta tandem faventibus superis obsidione, Hierosolymitanorum militum sacer, et strenuus ordo liberatus, Ioanne Valleto Gallo summum magisterium gubernante. Quam ob victoriam Taurini immensae laetitiae publica significatio reddita, et devotae superis gratiarum actiones.”

⁸Pingone 1577, 88: “Anno Christi 1571 Emanuel Dux Taurini agens, confoederatione inita in Turcam Cypri vastatorem, inter Pium quintum Pontificem, Hispaniarum Regem, et Venetam Rempublicam, qui classi praeeset ab omnibus exposcitur: sed ob imminentiam a vicinis discordiis patriae discriminis, excusatus habetur. Ioannes vero Austriacus Caroli quinti Caesaris soboles, magni animi, et expectationis iuvenis praeficitur. At Dux Andream Provanam Leniacum tribus cum triremibus in eam expeditionem adiungit. Apud Naupactum Achaicum concursum, et decertatum. Christianorum vix ducentum triremes: Turcarum vero plussquam trecentum: Mars diu anceps, tandem Deo maximo favente, et quodam potius miraculo ad Christianos inclinavit victoria. Leniacus ex triremi Praetoriam fortiter dimicans sclopeto ictus in capite vix galeae praesidio evasit: triremium una Margaritis nomine dissipata, mersaque penitus, Pedemontana semel atque iterum ab hostibus recepta. Ob eam victoriam, Taurini supplicationes superis, feriae mortalibus indictae.” See also Tonso 1596, 142, 161 and 177–179.

⁹Benedetti 1585, 214–216.

are entitled *De armilla nautica* (On the armillary nautical sphere) and *De usu armillae nauticae* (The utilization of the armillary nautical sphere), respectively.¹⁰ As one reads, the letters follow private discussions with Provana on the difficulties linked to navigation using nautical maps.

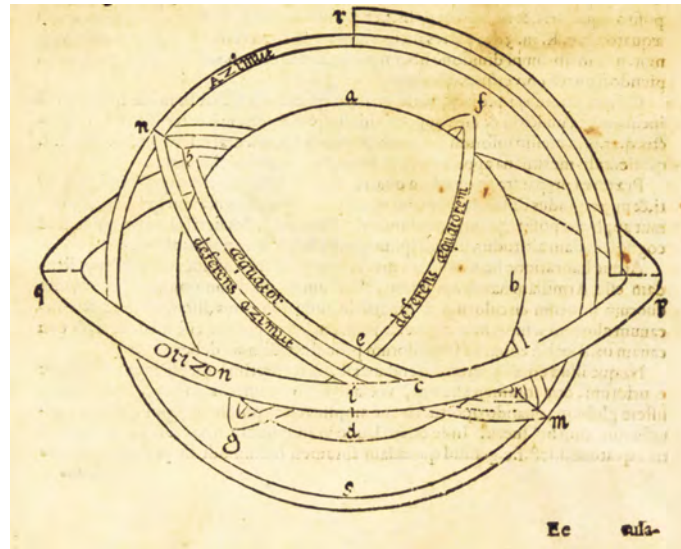


Figure 2.3: An armillary nautical sphere invented by Benedetti for Andrea Provana for navigation purposes, presumably in the Savoy military expeditions against the Turks. (Max Planck Institute for the History of Science, Library)

2.2 Civil Reforms and Military Policy

Emanuele Filiberto and his son were very different rulers. While the court of the former has been depicted as “*funzionale, ristretta e popolata di homines novi*” (functional, small and composed of *homines novi*) the latter’s court was “*fastosa, aristocratica, centro propulsore di una politica culturale oramai intensamente barocca*” (pompous, aristocratic, irradiating center of a deeply baroque cultural politics).¹¹ Their common efforts were directed towards the consolidation of their state. Emanuele Filiberto implemented profound administrative, financial, and military reforms. He issued tax reforms and imposed the use of the vulgar tongue in official documents. As to his military policy, Emanuele Filiberto introduced the obligatory conscription of all men aged between 18 and 50 years. Thanks to this reform, which followed the Swiss example and Machiavelli’s theory, Emanuele Filiberto trained his subjects to defend their territories in case of invasion, disposed of many thousands of soldiers, and limited the use of mercenary troops.¹² Part of his defensive strategy was the erection of new fortifications in Nice, Bourg-en-Bresse, Saint-Julien, and Montmélian (see Figure 2.4). The construction of the *cittadella* of Turin was particularly important and rapid. It was achieved in only two years, between 1564 and 1566, and was celebrated by the official town historian Emanuele Filiberto Pingone in the following terms:

¹⁰Benedetti 1585, 217–219 and 219–220.

¹¹Ricuperati 1998, XXII.

¹²See Stumpo 1993, 561.

In that year [1564], the duke began building a fortification, which is commonly called the citadel, in the most sacred part of the town on the ruins of the temple of the divine Savior.¹³

On March 15, 1566, the citadel of Turin was finished after a few months of work. It was admirable with its five bulwarks, serving all military purposes and built according to the art of architecture. He [the duke] let it be blessed with religious and pious blessings (Archbishop Della Rovere was in charge of the rite). Soon he organized the defenses, entrusting them to Giuseppe Caresana of Vercelli, a subject of his [*benemeritus*] and a man very expert in the military art.¹⁴

Francesco Horologi was responsible for the construction of the citadel, designed by engineer Francesco Paciotto, whom Emanuele Filiberto recruited in Flanders. Its pentagonal structure, responding to recent developments in warfare, was the model for later fortifications, such as the citadels created by the same Paciotto in Antwerp (1567) and Parma (1591).

As often occurred during the Renaissance, the military-political function of the citadel had two sides. On the one hand, it served to defend the town from possible assaults from outside. On the other, it affirmed the supremacy of the dukes over the new capital and had the function of dissuading the subjects from claiming too much autonomy.¹⁵ As Martha Pollak remarked, “Paciotto proposed a five-sided fortress, with three bastions oriented towards the countryside, defending the approach to the city from the west, and two bastions facing the city, ready to bring it under control in case of riotous uprisings against the duke.”¹⁶ The new urban arrangement transformed Turin along with its political balance of power. During these changes the relations between the dukes and the local *patriziato* were often strained. In fact, all decisions had to be negotiated between civic administrators, state functionaries, and the court. Whereas the town council was eager to keep its medieval privileges, the dukes made the opposite effort of centralizing power in order to grasp control firmly in their hands.

A thorough knowledge of the surrounding territory through cartography, alongside fortification and military reforms, was also seen as an important element of defense. The intensity of mapping efforts in the Savoy in the second half of the sixteenth century is a noteworthy example. A large number of maps of great quality were made, for instance Forlani’s *Savoia* (1552), Boileau de Boullion’s work on the road from Lyon to Turin (1556), Nicolais’s maps *Boulonnais* (1558), *Berry* (1566) and *Bourbonnais* (1569)¹⁷ and, above all, Giacomo Gastaldi’s *Pedemontanae vicinorumque regionum... descriptio* (1574). Many of the maps made in those years are still preserved in Turin, in the *Biblioteca Reale*, the *Biblioteca Nazionale Universitaria*, the *Archivio di Stato*, and in the wide collection of the *Archivio Storico della Città*.¹⁸ Benedetti shared this interest in

¹³Pingone 1577, 85: “Eo anno [1564] Dux in aeditiore parte civitatis, in ipsis templi Divi Solutoris ruinis Acropolis aedificare coepit, Cittadellam vulgo dicunt.”

¹⁴Pingone 1577, 86: “Anno Christi 1566 idibus Martiis, absoluta paucis mensibus Taurinensi acropoli, quinis propugnaculis admiranda, servata omni rei militaris, et architectonicae artis ratione eam religiosa ac pia benedictione communiri curat, Archiepiscopo Rovereo sacris praeunte: mox praesidiis firmat, eique praeficit Iosephum Caresanam Vercellensem de se benemeritum, ac rei militaris peritissimum.”

¹⁵Merlin and Stango 1998, 118–119.

¹⁶Pollak 1991b, 16.

¹⁷See Broc and Greppi 1989, 113.

¹⁸The Archivio di Stato preserves Carracha’s maps of Turin: *Augusta Taurinorum* (1577) and *Turino* (ca. 1580)—see Archivio Storico della Città di Torino 1982.



Figure 2.4: Fortification projects in a drawing by Benedetti's follower as court mathematician, Bartolomeo Cristini. (Biblioteca Nazionale Universitaria di Torino)

geography and topography. This especially emerges from some of his epistles, for instance those to the architect Gabriele Busca on topography and measuring instruments, to the imperial land surveyor (*agrimensor*) Anselm Rosenburg (presumably of the Bohemian aristocrat family Rožmberk) on measuring techniques, and to the Turin physician and natural philosopher Giovanni Battista Femello concerning cartographic errors about the position of islands, in particular Iceland.¹⁹

2.3 Engineering and Architecture

Countless engineers worked in Turin under Emanuele Filiberto and Carlo Emanuele I to implement the defenses and the hydraulic system, among them Francesco Paciotto, Ferrante Vitelli, Ascanio Vitozzi, and Vitozzo Vitozzi.

The leading Italian architect of that time, Andrea Palladio, visited Turin between May and June 1568. He might have been the architect behind the park of Viboccone (later known as *Regio Parco*) between the rivers Dora, Po, and Stura. Benedetti is said to have constructed his fountain there. It is also likely that Palladio gave Emanuele Filiberto advice on the organization of his popular militia according to the classical Roman model.²⁰ Later, he dedicated to the duke of Savoy the third of his four books on architecture, *Quattro libri dell'architettura* (Venice, 1570). This section deals with public constructions, streets, bridges, squares, basilicas, and gymnasia. In the letter to the reader, the author stressed the prestige deriving from public buildings, and the fruitful collaboration between Renaissance princes and architects: “[Public buildings] are bigger and more embellished with rare ornaments than the private ones; and they aim to be used by everybody. Therefore, through them, princes can display the greatness of their generosity to the world and

¹⁹Benedetti 1585, 271–274, 405–408 and 267.

²⁰Tessari 1993.

architects have the occasion to show how capable they are through beautiful and wonderful inventions.”²¹ The dedication to Emanuele Filiberto by Palladio was motivated by his “heroic spirit”²² as well as by his interest in and deep understanding of architecture:

As your Highness is familiar with the most noble arts and sciences related to these issues [concerning architecture], you will have much pleasure and relief by considering the subtle and beautiful inventions of humankind as well as the true science of this art, which you understand very well and which has been brought to the most rare and almost absolute perfection. This is witnessed by the illustrious and royal buildings that have been constructed in many parts of your large and most happy state.²³

Urban and military developments were accompanied by a flourishing literature on war and defense theory. Emanuele Filiberto was a great supporter and collector of such writings:²⁴ among other examples, Benedetti’s correspondent Busca authored the treatise *Della espugnazione et difesa delle fortezze* (On the conquest and defense of fortresses, Turin, 1585), which followed the *Istruzione de’ bombardieri* (Education of the bombardiers, Carmagnola, 1584). He would later publish the tract *Architettura militare* (1601) in Milan. Another acquaintance of Benedetti’s, Giacomo Soldati composed *Discorso intorno al fortificare la città di Torino* (Discourse on fortifying the town of Turin).²⁵

In this context of military reforms and architectural changes aimed at transforming Turin into the capital of an absolutist state, the skilled engineers implementing the dukes’ vision gained high social recognition. An example is the career of the mathematician Cristini. In 1569 he was courtly librarian and later “calcolatore” or “controllore delle fabbriche,” that is, supervisor of architectural projects. In this capacity, he became closely connected to the celebrated military and civil architect Ascanio Vitozzi. On December 13, 1582, he became “re d’arme dell’ordine dell’Annunziata,” a honorific and administrative title that implied responsibility for the organization of courtly tournaments, feasts, and balls.²⁶ He entered the court as Benedetti’s successor in the position of ducal mathematician. Cristini’s career shows the enhanced status of Renaissance scientist-engineers bringing together mathematical and natural expertise, technical skills, administrative duties, and courtly honors. Benedetti addressed one of the letters of the *Diversae speculationes* to him (the one dealing with geometrical problems encountered in Ptolemy’s *Geography*) calling him “Bartholomeo Christino Serenissimi Sabaudiae Ducis apparitor.” The term *apparitor* can mean either “servant” or “functionary.” An unknown hand corrected this title in a copy preserved in the Royal Library of Turin, substituting it for the more

²¹Palladio 1570, III, 5: “Ne’ quali [edificii publichi], perché di maggior grandezza si fanno, e con più rari ornamenti, che i privati, e servono a uso, e commodo di ciascun; hanno i Principi molto ampio campo di far conoscere al mondo la grandezza dell’animo loro; e gli Architetti bellissima occasione di dimostrar quanto essi vagliano nelle belle, et meravigliose invenzioni.”

²²Palladio 1570, III, 3: “Principe, il qual solo a tempi nostri con la Prudenza, e co’l valore s’assimiglia a quelli antichi Romani Heroi, le virtuosissime operationi de’ quali si leggono con maraviglia nell’historie, et parte si veggono nell’antiche ruine.”

²³Palladio 1570, III, 3: “Delle qual cose [concernenti l’architettura] essendo l’A[ltezza] V[ostra] dotata delle più nobili arti, e scientie; piglierà non poca contentezza, e consolazione considerando le sottili, e belle invenzioni degli huomini, e la vera scienza di quest’arte, da lei molto bene intesa, e ridotta a rara, e perfetta perfezione; come dimostrano gli illustri, e reali edifici fatti fare, e che tuttavia si fanno in diversi luoghi dell’amplissimo, e felicissimo suo stato.”

²⁴Pollak 1991a, 18–26.

²⁵See Viglino Davico 2005, Pollak 1991a and Signorelli 1969–1970.

²⁶Vernazza 1783, 8 and 11.

emphatic “P[rim]o Feciali,” that is to say, “First Herald.”²⁷ This was in fact the most appropriate title for the “Roy d’armes.”²⁸ It is possible that this correction was inserted by Benedetti himself.

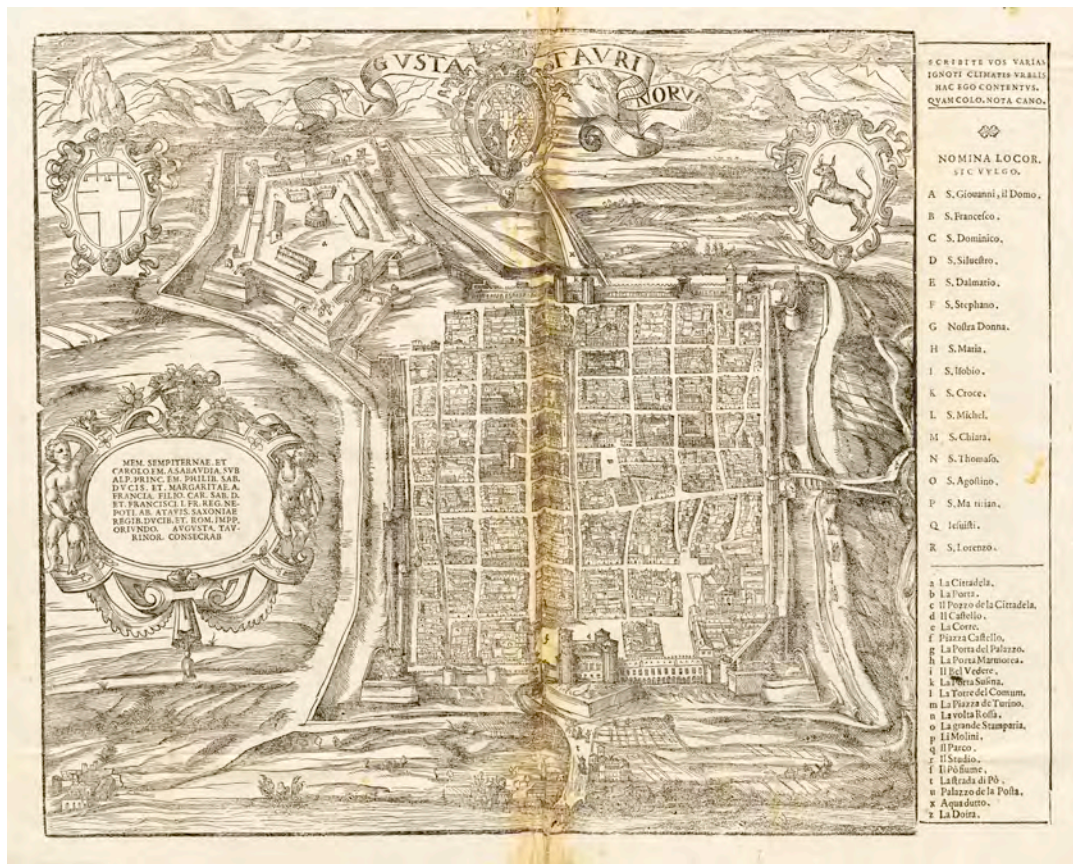


Figure 2.5: Map of Turin in Benedetti’s times, from Pingone’s *Augusta Taurinorum* (1577). (Staatsbibliothek zu Berlin)

Benedetti interacted with architects and engineers, as can be seen in his correspondence. Four of the scientific letters included in the *Diversae speculationes* are addressed to the architect Busca. Their topics, however, are not strictly related to building or engineering. In fact, their topics range from meteorology to instruments, topography, and natural philosophy.²⁹ Benedetti was closely related to the ducal “architect and cosmographer” (*Architetto e Cosmografo*) Soldati, who had worked as a hydraulic engineer and architect in Milan and in Lombardy, and joined the Turin court in 1576. Benedetti held him in great esteem, judging by the dedication to him in one of the most technical parts of the *Diversae speculationes*, that is, the entire second book, which is entitled “Explanation on Operations of Perspective” (*De rationibus operationum perspectivae*).³⁰ Besides, Benedetti’s interest in engineering and measuring instruments emerges from many writings, especially from his work on gnomonics (1574) and from a manuscript analysing a measuring instrument that

²⁷The letter is to be found in Benedetti 1585, 330–331. The collocation of the volume in the *Biblioteca Reale di Torino* is G 43 8.

²⁸Vernazza 1783, 37, n. 31.

²⁹Benedetti 1585, 271–277.

³⁰Benedetti 1585, 119–140. See Mamino 1989.

is preserved in the *Biblioteca Civica di Carignano*, entitled *Descrittione, uso, et ragioni del Trigonolometro* (1578).³¹

2.4 Intellectual Ferment: Arts, Literature, and Philosophy

Renaissance Turin was as appealing to mathematicians as to all other types of intellectuals, including artists, literati, and scholars in general. One could mention the names of two reputed theorists of art who were closely linked with the court: Federico Zuccari and Lomazzo. The former wrote *L'idea de' pittori, scultori, et architetti* (The idea of the painters, sculptors and architects, 1607) and the latter *Trattato dell'arte della pittura* (Treatise on the art of painting, 1584), dedicated to Carlo Emanuele I. Lomazzo also dedicated to the duke of Savoy his collection of poems, *Rime* (1587), including one for Benedetti. Among the artists appointed by the duke, the Flemish Jan Kraeck or "Carracha," who resided in Chambéry, not only painted; he also worked as a cartographer and made a large map of Turin in 1572 (385x397 cm) as part of a wider cartographic program.

Illustrious scholars came to Emanuele Filiberto's court or to the reopened university, first in Mondovì and later in Turin. Among them, the man of letters from Ferrara, Giovanni Battista Giraldo Cinzio, was appointed to teach humanities. His collection of *novelle*, the *Ecatommiti* (Mondovì, 1565), ended with a long celebratory poem mentioning the most visible intellectuals of the Peninsula. Many of them were linked to the duke of Savoy, either as professors or as courtiers.³² For instance, Francesco Ottonaio of Florence, who taught mathematics at the university in Benedetti's years and exchanged views with him, is extolled for his expertise in astronomy, meteorology, and astrology:

My Ottonaio moves his feet towards you along with the others.
He received the gift of scrutinizing the heavens,
of knowing the reasons for warmth and coldness,
why the days are short or long,
and what layer veils the Sun making it dark,
the manner in which the year becomes adorned of beautiful flowers again,
what nativity is a sign of honor and merit
or of shame and disgrace,
and what is the star presiding over
a man's state from his birth
until his vital light is extinguished
one circle after the other.³³

³¹Mamino 1989, 432–433 and Roero 1997.

³²Villari 1988, 93–95 and 107–110. See Doglio 1998, 599ff.

³³Villari 1988, 93–94:

“Move insieme con lor verso te il piede
il mio Ottonaio, a cui scorrere il cielo, per grazia, diede.
Del caldo la cagion saper, del gelo,
e perché breve sia, sia lungo il giorno,
e quale offoschi il sole oscuro il velo;
come ritorni di bei fiori adorno
l'anno e chi debba aver dal nascimento
onore e pregio, e qual ingiuria e scorno;
e da che stella prender de' argomento
de lo stato suo l'uom, poi ch'egli è nato,
insin che il suo vital lume sia spento

Giraldi Cinzio did not mention Benedetti as he had not yet come to Savoy, but he included the Turin physician and professor of medicine Antonio Berga, with whom Benedetti would later enter a controversy over the proportion of water and earth in the terraqueous globe:

With his gentle and beautiful works
he tries to subtract his name from the oblivion,
defeating the stealing forces of greedy time.
I refer to my gentle Antonio Berga,
who shows the way to those who wish to learn
by writing his papers for the common good.³⁴

Two famous authors who visited Turin between 1576 and 1579 are the poet Torquato Tasso and the philosopher Giordano Bruno. Both arrived in the town as fugitives and both enjoyed their stay. Tasso interacted with the cultivated elites. The Turin philosopher and physician Agostino Bucci appears as *persona dialogans* in three dialogues of his (*Il Forno ovvero della nobiltà, Della dignità, and Della precedenza*). His connection with the court is further confirmed by the dedication of the 1581 edition of the *Gerusalemme liberata* to the prince of Savoy.³⁵

As for Bruno, he did not establish lasting contacts in town. He visited Turin in 1576 (or at the beginning of 1577) for the first time after abandoning the Dominican cloister of Naples, where he was accused of heresy. However, as he stated later in his Inquisition trial, “non trovando trattenimento a mia satisfattione, venni a Venezia per il Po [as I did not find sufficient means, I came to Venice along the Po].”³⁶ He visited Turin again in 1578 and went to Chambéry, where he spent the winter of that year as a guest of the Dominicans. On that occasion he possibly carried a booklet, now lost, entitled *De’ segni de’ tempi*, that he had printed in Venice and that probably dealt with the comet of that year.³⁷ We will refer to his possible involvement in some polemics on the comet of 1577–1578 later. It is hard to say whether Bruno and Benedetti ever met or were informed of each other’s views. In spite of the fact that they belonged to very distant milieus, there is some affinity between their outlooks. Both shared an aversion to Aristotle, the project of reforming natural philosophy, the support for the Copernican system, and other cosmological views.

The case of the philosophical poet Pandolfo Sfondrati also deserves our attention. He was active in Turin as a poet at the same time as Benedetti and authored poems that were often inserted in the first pages of books printed by the Bevilacqua printing house. Pandolfo made himself visible in Turin with celebratory poems that were included in important local publications, in particular in the works of the court historian Emanuele Filiberto Pingone: *Augusta Taurinorum* (1577), *Inclytæ Saxoniae Sabaudiaequè principum arbor gentilitia*

di cerchi in cerchio.”

³⁴Villari 1988, 95:

“E quel che, con gentil opre, e leggiadre,
tenta che il nome suo da l’oblio s’erga,
vinte del tempo avar le forze ladre,
i’ dico il mio gentile Antonio Berga,
che addita, a chi imparar cerca, la strada,
mentre, ad util comun, le carte verga.”

³⁵Doglio 1998, 621 and 625.

³⁶Firpo 1993, 159. See Ricci 2000.

³⁷Ernst 1992.

(1581) and *Sindon evangelica* (1581).³⁸ Hence, Sfondrati frequented the same courtly and cultural environment as Benedetti. It is likely that they discussed natural issues together, especially when considering that Sfondrati composed philosophically minded poems such as the Copernican *Inferiora regi dum syderis omnia motu*, which opens the *Animadversiones in Ephemeridas* by Benedetto Altavilla (Turin, 1580). There is also evidence that Benedetti was familiar with the Sfondratis, in particular with Paolo Sfondrati, who was a senator of Milan and an ambassador of Filippo II in Turin.³⁹ Moreover, Pandolfo Sfondrati authored the atomistic poem *Democriti prohibent nosci corpuscula formas* and a treatise on the tides, which he explained in mechanical terms as the result of the interaction of water particles warmed up by solar rays.⁴⁰

2.5 Religious Policy

2.5.1 Pragmatic Counter-Reformation

The relics were moved from the old to the new capital: Christ's shroud traversed the Alps together with the court. Religion was an essential stabilizing factor. According to the report of the political thinker Giovanni Botero, Emanuele Filiberto declared that piety was essential to guarantee his authority in the state: "Those people who are zealous in their devotion [to religion] are more moderate: in consequence, they obey their Prince better than licentious people."⁴¹ His religious politics were characterized by pragmatism. He undertook measures against the dissemination of the Reformation in his country and repressed the reformed communities only insofar as they jeopardized the integrity of the state or its relations with Rome or with other Catholic countries. The persecution of the Valdesans in the Alpine valleys, between 1559 and 1560, was part of a wider endeavor aimed at establishing a Catholic league that could favor his conquest of Geneva. However, when the prospect of an anti-Protestant confederation vanished, Emanuele Filiberto interrupted the aggression. The resistance of the Valdesans had been strong and persistent. It was a destabilizing factor for the duchy. A compromise was reached on June 5, 1561, when Emanuele Filiberto promulgated an edict, known as the Edict of Cavour, conceding to the Valdesans freedom of worship in their mountains. In exchange, he imposed the construction of new fortifications and strict military control of the Alpine passes.⁴²

The other pole of Savoy religious politics was external. It concerned the regulation of jurisdictional issues with the Roman Church. A reason for friction was the taxation of the ecclesiastics, which Rome was reluctant to grant. The economic stake was high, since the estates belonging to the Church amounted to a third of the land; in some areas, it even reached values comprised between 40 and 70 percent. The ancient privileges of the dukes to select the candidates for the principal ecclesiastical positions had to be negotiated anew. It was only in 1573, under Gregory XIII, that these were confirmed. Finally, the introduction and the reinforcement of the Inquisition in the duchy fostered confessional uniformity but interfered with secular jurisdiction.⁴³

³⁸See Griseri 1998.

³⁹In a letter to Benedetti, Francesco Patrizi asked him to give his regards to Baron Sfondrati. See Patrizi 1975, 42–43.

⁴⁰See Omodeo 2008b and Omodeo 2012a.

⁴¹"La gente infervorata di devotione è molto più regolata: e per conseguenza più ubidiente al Suo Prencipe, che la dissoluta." Botero 1608, 241.

⁴²De Simone 1958.

⁴³See Merlin 1995, 238–267, chap. IX, "Tra Controriforma e Ragion di Stato."

The new Inquisition, established in the wake of the Council of Trent in order to counter the Reformation and reaffirm Catholic hegemony in Italy, had a centralized structure with ramifications for the entire Peninsula. The Holy Office lay at its heart. The various Italian states accepted it as a preventative measure against public disorder, especially against confessional conflicts such as the civil wars affecting France and other European areas. The Inquisition was a repressive control system binding Rome and the local powers. It was a compromise in which, in Adriano Prosperi's words, "l'aiuto era offerto e richiesto in nome della conservazione del potere, quello politico dei principi e quello della corporazione ecclesiastica" (The aid was offered and requested in order to preserve the power—the political one of the princes as well as that of the ecclesiastical corporation.)⁴⁴ Nonetheless, the jurisdiction problem remained acute: what was the legitimacy of a foreign tribunal—the Roman one—trying and condemning the subjects of other countries? In Piedmont, the interests of Turin and Rome were guaranteed through the mediation of the Papal nuncio, who was obliged to inform both the duke and the Holy Office in Rome about Inquisition trials.⁴⁵ For their part, these authorities could intervene in the trials and had the right to give their consent concerning the opportunity to carry them out. However, the opposition to the establishment of the Inquisition was strong, particularly in the French-speaking areas. Relying on its Gallican tradition, the local church in Savoy did not accept a form of direct control from Rome.⁴⁶

The relations between Emanuele Filiberto and the Papacy were not always calm, and became strained after the Cavour edict of tolerance in 1561. Its promulgation provoked the protests of Rome and the commission of the intransigent Cardinal Inquisitor, Michele Ghisleri, to the diocese of Alexandria as Bishop of Mondovì, with the aim of reinforcing religious control. The relations between this champion of orthodoxy and the pragmatic politics of the Savoy dukes were tense, including after Ghisleri was elected pontiff as Pius V in 1566.

2.5.2 Jesuit Colleges in Piedmont

In 1561 Emanuele Filiberto supported the foundation of the first Jesuit college in his territories, in Mondovì, where the university was located at that time. A second college was established in Chambéry (1564), which was the former capital of the duchy. Among the Jesuit teachers, Antonio Possevino is one of the most renowned. The future compiler of the *Bibliotheca selecta* (1593) sojourned in Piedmont between 1560 and 1562.⁴⁷ From 1564 to 1567 the future cardinal and inquisitor Robert Bellarmine was also there but could not be appointed professor of philosophy in the Jesuit college of Turin, opened in 1567, due to the intransigent opposition of the university against the attempts to transfer this chair from the university to the Jesuit institution.⁴⁸ Both in Mondovì and in Turin the Jesuits took over the so-called "public schools," which essentially taught the rudiments of grammar.⁴⁹

In those years, the chair of letters belonged to the Ferrara humanist Giovanni Battista Giraldi Cinzio, whose religious tendencies could be called Erasmian.⁵⁰ At the moment of the establishment of the Jesuit college in Turin, he sided with the humanistic legacy

⁴⁴Prosperi 1996, 57–58.

⁴⁵See Prosperi 1996, III, "Inquisizione romana e stati italiani" and Black 2013, 30.

⁴⁶Prosperi 1996, 103–105.

⁴⁷Longo 1998, 475 and Scaduto 1959, 52.

⁴⁸Grendler 2002, 42.

⁴⁹Vallauri 1846, 19.

⁵⁰For instance, Giraldi Cinzio defended the famous commentator on Aristotle's *Poetics*, Ludovico Castelvetro, who was excommunicated in 1560 as "eretico fuggitivo e impenitente" for his alleged bias towards Melancthon. On this occasion Giraldi Cinzio argued that violence and coercion could only produce the

against their pedagogy. He paid the price of their expansion, as his chair was suppressed and transferred to the Jesuit college.⁵¹ From 1567 to 1574, the Jesuits received 200 *scudi* per year to teach Greek and Latin grammar, humanities, and rhetoric to the youth (half of Giraldi's salary). Thus, the humanist had to abandon Turin for Pavia in 1569. In a letter to the Florentine philologist Pietro Vettori (Pavia, March 20, 1569), he lamented his expulsion, although he expressed his gratitude to the dukes for the donation of 500 *scudi* for his leave.⁵² He particularly protested that his teaching as a learned humanist was being substituted by the teaching of elementary grammar.

The opening of the Turin college set off enduring hostilities between the Jesuits, on the one side, and the university and the municipality on the other. According to Grendler's reconstruction, between 1570 and 1572 the duke and the rector, Achille Gagliardi, made an agreement according to which nine chairs would be given to Jesuit professors. However, the project did not succeed owing to obstruction on the part of the town and the university.⁵³ In these struggles, the Archbishop Gerolamo della Rovere was among the most strenuous opponents of the Jesuits. The position of Emanuele Filiberto fluctuated. Initially, he supported the "reverend fathers" but later distanced himself from their educational projects. In 1575 he even reintroduced the teaching of humanities in the university. There is indirect evidence that Benedetti sided with the humanists in this anti-Jesuit controversy. In 1583 Francesco Patrizi, who belonged to the same Ferrara cultural environment as Giraldi Cinzio, asked him to support the candidacy of his friend Giovanni Giacomo Orgiazio for the position of professor of humanities in 1583.⁵⁴

Apart from the political interests at stake (the privileges of the town and of the university), the professors' resistance concerned the contents of the teaching, as one reads in a document from 1593, "Raggioni perché non sia bene che gli Rev[erendi] Padri Gesuiti leggano la filosofia tutta, et la logica nel loro Comento, et si lasci a leggerli nello Studio et pubbliche scuole, come sempre insino a qui si è fatto" (Reasons why it is not good that the Jesuit Reverend Fathers teach all philosophy and logic in their commentary and are allowed to teach at the university and in public schools, as has been the case until now).⁵⁵ According to the academics, philosophy should be imparted to students as the fundamental tenet of the study of medicine. Therefore, the focus should be set on Aristotle's natural philosophy and not on metaphysics and logic, as was the case with the Jesuits. Metaphysics, as one reads in the document, is the "last" and not the "first" part of philosophy. By contrast, the Jesuits began their teaching with the most abstract issues, e.g., the statute of ideas and universals, and divine ineffability ("*utrum Deus sit in praedicamento*" or "*utrum Deus sit infinitus*").

opposite effects than those wished for by the defenders of orthodoxy. See Cinzio 1996, Letter n. 101, 371, n. 3.

⁵¹ Vallauri 1846, 19 and Grendler 2002, 42–43.

⁵² Cinzio 1996, Letter n. 127, 425: "Sed Taurino iam menses quatuor absum, Ticinique publice profiteor. Nam, praeter iacturam valetudinis, quam ibi quotidie faciebam, me ad abeundum urgentem, natio illa haec nostra studia nihil quidem facit. Hinc Princeps ille, qui oratoriam ac poeticam facultatem profiteretur, in Academia sua habere constituit neminem, quod satis esse censuerit Iesuitas nescio quos, suo in collegio, hoc muneris cum puerilis ac infantibus obire; qui, cum Deuspaterio quodam, barbaro plane auctore, mollia ingenia, obscurissima, ne dicam foedissima, imbuunt barbarie. Me tamen abeuntem, praeter annuam quadrigentorum aureorum nummum stipe, quam liberaliter exsolvit, centum etiam scutatis aureis donavit."

⁵³ Grendler 2002, 42–44.

⁵⁴ Patrizi to Benedetti (Ferrara, 21 March 1583), Patrizi 1975, 39.

⁵⁵ Archivio di Stato di Torino, Istruzione Pubblica/ Regia Università di Torino/ Mazzo 1 (1267–1701), Fascicolo 7/2. The document is included as an appendix to Omodeo 2014d.

2.5.3 Benedetti and the Counter-Reformation

What can be said about Benedetti's attitude toward the culture of the Counter-Reformation emerging after the Council of Trent? We can assume that his scorn for Aristotelian philosophy was not only a dispute with the university professors of his day, but also with the theology-oriented Aristotelianism propagated through the cultural apparatus of the post-Tridentine Church. We have no evidence that Benedetti frequented exponents of the Jesuit order, in spite of their presence in Turin. Rather, we have evidence of his connections with scholars who were not in the mainstream of the official Catholic culture of those years.

Among others, he corresponded with Francesco Patrizi of Cherso, whose Platonism was regarded with suspicion and even censured in Rome. The closeness between them is witnessed by the fact that Benedetti acted as a mediator between the philosopher and the duke of Savoy on at least one occasion. When Patrizi issued his *Della nuova geometria libri XV* (Fifteen books on the new geometry, Ferrara, 1587) with a dedication to Carlo Emanuele I, Benedetti passed on a copy to his patron. Patrizi expressed his gratitude with the following words (Ferrara, April 6, 1587):

Very Magnificent and Excellent Signore,

I rejoice with your Lordship that you recovered from sickness quicker than believed. And I am very thankful to you for presenting my book to the very serene Prince and promising to inform me about his remarks after he has read it. If by chance the book will be forgotten, due to his many duties [negozi], I hope at least that you will remember me. If his High Serenity will give some sign that he appreciated it [my book], I will be very glad and I will be particularly grateful to your Lordship for your benevolence.⁵⁶

In exchange, Benedetti sent him a copy of his discussion on the relative sizes of the elements of earth and water, as witnessed by a letter from Patrizi (Ferrara, 18 January 1588).⁵⁷

The two scholars shared views on cosmology that were to be censured by the Inquisition in the 1590s. It is thus expedient to briefly recall Patrizi's natural and cosmological views, as they are close to those Benedetti expressed in his writings, especially in the *Diversae speculationes*. Already in his *De rerum natura libri I priores. Alter de spacio physico, alter de spacio mathematico* (First Two Books on Nature, One on Physical Space and One on Mathematical Space, 1587), Patrizi embraced the neo-Stoic doctrine of the fluidity of the heavens, the infinity of space beyond the sphere of the stars, and the free motion of planets through cosmic space following an inner drive. He later expanded on that in *Pancosmia*, which is the cosmological section of his philosophical masterwork, *Nova de universis philosophia* (New Universal Philosophy, 1591). In it, he did not limit himself to asserting the infinitude of luminous space beyond the visible stars, to repeating the thesis of planetary self-motion, and to rejecting the existence of celestial spheres responsible for the transportation of the heavenly bodies. He also ascribed to Earth the daily motion around its axis without renouncing its central position in the cosmos and in

⁵⁶Patrizi 1975, XXVII, 53: "Molto Magnifico et Eccellentissimo Signore, mi rallegrò con Vostra Signoria, che più tosto che non credea si è rilevata dal male, e li rendo moltissime gratie dell'haver presentato il mio libro a quel Serenissimo Principe, e ricevuto il favore, che Ella mi avvisò ciò che haverà detto, dopo che l'havrà letto. Et se per sorte per li molti negozii il libro andasse in oblio, spero da Lei il rimedio di un poco di ricordanza, la quale, se partorirà alcun segno che Sua Altezza Serenissima l'habbia havuto caro, mi sarà carissimo e tutto l'obbligo l'haverò a Vostra Signoria e all'amor suo verso me."

⁵⁷Patrizi 1975, 57–58. In the letter Ottonaio is also mentioned as a common acquaintance and an intellectual partner.

the planetary system.⁵⁸ All of these theses—which, as we shall see, are also present in Benedetti's *Diversae speculationes*—were censured by the Inquisition in the 1590s, in the course of an attack directed against Patrizi's *Nova de universis philosophia*.

The censure of Patrizi's philosophy occurred after Benedetti's death—he was lucky enough to avoid witnessing the prohibition of theses to which he subscribed. On October 8, 1592, the Master of the Sacred Palace, Bartolomé de Miranda, and his fellow, Pedro Juan Saragoza, wrote a document of censure, attacking many passages and doctrines of the *Nova philosophia*. The same Saragoza would later be one of the two censors of Bruno's work during his Inquisition trial in Rome.⁵⁹ The two censors of Patrizi did not limit their criticism to theology (especially Patrizi's theses on the Trinity) but also scrutinized natural philosophy and cosmology. They rejected the idea that there is only one unique heaven and judged this to be an opinion at odds with accepted philosophical doctrines and against theology (*In lib. 13 Pancosmias tenet unum tantum esse caelum*). Furthermore, Patrizi was accused of following Copernicus, whose doctrine of terrestrial motion was seen as incompatible with the Bible:

In *Pancosmia*, Book 17, f. 103, p. 1, column 2a, he [Patrizi] states 'that the motion of the Earth is by far in better agreement with reason than the motion of the heavens or the uppermost celestial bodies.' And he refers to Nicolaus Copernicus's sentence according to which the sidereal heaven is immobile, along with the stars, while the Earth moves.⁶⁰

Further theses to be censured were his vitalistic concept of celestial bodies and celestial infinity. The criticism of the latter point goes as follows:

This [to sustain this view] is to dream in very deep obscurity and fall down a precipice after abandoning the common way. In fact, the best and greatest God created everything according to weight, number, and measure. Therefore, everybody agrees that no infinite body is possible in act and no existing multiplicity can be infinite in act. On the empyrean heaven see the Fathers and Thomas Aquinas.⁶¹

Patrizi replied with an *Emendatio in libros suae novae philosophiae* (Correction of the Books of His New Philosophy), written before Christmas 1592. As far as Earth's motion is concerned, he clarified that he advocated its motion but not its eccentricity (*Non tamen dixi, eam de medio suo et naturali loco exire*). Furthermore, he stressed that terrestrial motion was supported by many arguments and several philosophers, and claimed that this view does not contrast with theology. However, he declared himself ready to erase passages referring to terrestrial motion, if necessary (*Delebo tamen si iubetis*). He also defended his views about the infinity of space but was ready to renounce this thesis as well, if he was ordered to do so: "Delebo hanc etiam si iubetis."⁶²

⁵⁸Seidengart 2006, 116–124 and Omodeo 2014a, 174–175.

⁵⁹See Bruno 2000b, doc. 45, 225.

⁶⁰Baldini and Spruit 2009, Vol. I, 3, 51, doc. 1, 2216: "Lib. 17 Pancosmias fol. 103, pag. 1, col. 2.a ait *quod Terram revolvi longe videtur esse rationi consonantius, quam Coelum, vel suprema astra moveri. Et refert sententiam Nicolai Copernici dicentis Coelum sydereum stare simul cum stellis, Terram vero moveri.*"

⁶¹Baldini and Spruit 2009, Vol. I, 3, 51, doc. 1, 2219: "Hoc est somnare per altissimas tenebras, et a communi declinando in praecipitia ruere, nam cum Deus opt. Max. omnia in pondere, numero, et mensura produxerit, nullum infinitum corpus actu dari nullamque rerum subsistentium multitudinem actu infinitam omnes viri fatentur. De Coelo empyreo consultat Patres, et sanctum Thomam."

⁶²Baldini and Spruit 2009, Vol. I, 3, 51, doc. 7, 2231.

The Jesuit Benedetto Giustiniani proved a more open-minded censor of Patrizi's natural views in 1593.⁶³ The same person, however, would be one of the eleven theologians who decided that the Copernican theory was not reconcilable with the Catholic religion, in 1616. As to Patrizi's work, it was downright (*omnino*) prohibited in 1594, and placed in the Clementine Index of 1596 as well as in later Indexes.⁶⁴

Not only did Benedetti correspond with intellectuals engaged against the mainstream in Rome, but he himself had differences with Roman Aristotelians, as he mentioned in the preface to the second edition of the *Demonstratio motuum localium contra Aristotelem* (1555). On some occasions, Benedetti even allowed himself to be ironical about theological dogmas. For instance, in one of the letters of the *Diversae speculationes*, he accompanied his adherence to methodological Pythagoreanism (a mathematical approach to the investigation of nature) with a joke about reincarnation and his earlier life:

If the souls' transmigration imagined by the father of Italian wisdom, Pythagoras, were true, I believe that your soul and mine were once the souls of hunting dogs.⁶⁵

Another indicator of Benedetti's attitude towards the Counter-Reformation and the confessional quarrels of his time emerges from his approach to the calendar reform. This was a very divisive issue. The pope imposed upon all Christianity an emendation of the calendar in an age when it was affected by profound divisions. In this climate, the pope's political and religious legitimacy and his authority in such matters was cast into doubt by many, especially in the reformed countries. Reputed Lutheran astronomers such as Michael Maestlin opposed the calendar reform implemented by Christopher Clavius and promulgated by Gregory XIII in 1582. The elimination of ten days to make the spring equinox date correspond to its date at the time of the Council of Nicaea was particularly controversial, since it symbolically legitimized the universality of the Roman Church through Constantine I. Benedetti wrote a reform proposal on April 1, 1578, and Emanuele Filiberto sent it to Rome on May 31. The text was printed two times, first in 1578, and then reprinted in 1585 as the first of the letters in the epistolary section of the *Diversae speculationes*. The most striking feature of Benedetti's proposal is its technical radicalism and extreme rationalism. August Ziggelaar's perspicuous description of Benedetti's proposal here follows: "Benedetti prefers the Eastern date to be fixed according to the true motions of Sun and Moon rather than by cycles. He finds that the Prutenic tables are sufficiently exact for this purpose. Furthermore not ten days, not even 14, but 21 days should be left out in order to make the first day of January the winter solstice. The lengths of the months are to be adjusted so that they coincide with the presence of the Sun in each of the twelve zodiacal signs. Surely, these time intervals change their lengths in the course of time because of the motion of the perihelion of Earth, but Benedetti assures us that only after 24,000 years will an adjustment be necessary. The proposal is not only interesting and original but also very rational because, by eliminating all reference to the Moon, it makes the year entirely solar."⁶⁶ The extreme technicality of such a proposal, one can argue, was

⁶³Baldini and Spruit 2009, Vol. I, 3, 51, doc. 10.

⁶⁴For a reconstruction of the anti-Platonic reaction also affecting the reception of Patrizi, see Rotondò 1982. On the censure of 1616, see Bucciantini 1995, Bucciantini, Camerota, and Giudice 2011 and Omodeo 2014a, chap. 7.

⁶⁵Benedetti 1585, 285: "Si vera esset animorum illa transmigratio quam sibi Italicae sapientiae Pater Pythagoras effinxerat; tuam, meamque existimarem animam canis, quandoque venatici fuisse."

⁶⁶Ziggelaar 1983, 211 and 214.

also a means to de-ideologize the issue. Therefore, it was not only rejected for its “scientific radicalism” but also for its rationalistic distance from confessional struggles. This positioning is in line with late-humanistic universalism and signals Benedetti’s distance from the Counter-Reformation and the militant cultural production of those years.⁶⁷

2.6 Cultural Institutions: University, Academies, Collections, and the Press

The reformation of the *Studio* was a cornerstone in Emanuele Filiberto’s and his successor’s cultural policy. It was reopened in Mondovì in 1560 after the French closed it as a potential center of dissent and revolt. It was transferred to the new capital on October 12, 1566, after long discussions and a dispute between Turin and Mondovì. According to the new statutes, issued in 1571, the direction of the university was conferred to nine *reformatores*, among whom were the Archbishop, the ducal chancellor, the first and second presidents of the Senate of Turin, and the court physician. These men were responsible for the scientific and administrative direction, and for academic discipline.⁶⁸

Most of the professors (about thirty people) were jurists. Among them, the most reputed was the professor of civil law Guido Panciròli. The physicians Francesco Valleriola and Giovanni Argenterio were also illustrious professors, known and appreciated by Conrad Gesner and Michel de Montaigne. The reopening of the university offered Argenterio the opportunity to come back to Piedmont after many years of practice as a physician in Lyon, and of teaching in Antwerp, Bologna, Pisa, Rome, and Naples.⁶⁹ Teodoro Rendio of Chio was appointed to teach Greek grammar and, as mentioned before, the poet Giraldo Cinzio became professor of humanities. At the University of Turin, the teaching of philosophy on the basis of the *corpus Aristotelicum* received high recognition, as the professors in this discipline had a better salary than their colleagues of medicine. Giacomo Castagneri taught on Aristotle’s *Physica*, *De generatione et corruptione*, and *De Anima*. Other celebrated scholars in philosophy were Antonio Berga and Agostino Bucci, both Piedmontese educated at Padua.⁷⁰

One of the most reputed professors appointed in Mondovì was Francesco Vimercato of Milan, with whom Benedetti later corresponded. Vimercato was a thoughtful Renaissance commentator on Aristotle, whose work he read in the original language. He published commentaries on *De anima* (1543), on *Metaphysics* (1551), in particular on book lambda and on *Meteorologica* (1556). However, his commentary on *Physics* has to be seen as his magnum opus. After his studies in renowned Italian universities, he was appointed in Paris as the first royal lector in philosophy. There, he was first involved as a judge in the Ramist disputes and later was a colleague of Petrus Ramus. In 1561 he came to Piedmont to serve the Savoy family as a university professor, a councillor, a tutor to Carlo Emanuele I, and, from 1567 to 1570, as diplomat in Milan.⁷¹

Bordiga argued that Benedetti might have taught at the reopened university, first in Mondovì and then in Turin, by relying on some indirect sources. In fact, the information about Benedetti’s teaching activity at Mondovì was derived from the sixteenth-century biographer of Emanuele Filiberto, Giovanni Tonso, who included his name on the list of

⁶⁷Steinmetz 2011.

⁶⁸See Bonino 1824–1825, Naso 1993, and Catarinella and Salsotto 1998.

⁶⁹On Argenterio, see Temkin 1974, 141–144 and 149–152 and Mammola 2012, 185–193.

⁷⁰On the philosophical culture of Turin of those years, in particular on Bucci, see Mammola 2013.

⁷¹See N. W. Gilbert 1965.

those who made that university eminent (*Qui viri insignes publice docuerint*).⁷² Another contemporary of Benedetti, the mathematician Cristini, mentioned him as one of those whom Emanuele Filiberto called to Turin in order to increase the prestige of his university.⁷³ Still, the role that he could have played in the academic life of Turin remains obscure.⁷⁴

We could find no direct evidence that Benedetti served as a professor in the documents preserved at the *Archivio di Stato di Torino*. We considered the acts gathered under the signature “Istruzione Pubblica/ Regia Università di Torino/ Mazzo 1 (1267–1701),” which include the statutes of 1571 and other precious sources concerning the first years of the university. A dossier entitled “1571, Costituzione de’ Riformatori dell’Università dello Studio di Torino, coll’Istruzione da osservarsi da medesimi, colle distribuzioni delle ore per la Lettura, e Rolli de’ Stipendi de’ Lettori” (*fascicolo 7 primo*) includes decrees concerning the reform of the university, the names of those responsible for accomplishing it, and a list of the chairs with the corresponding salaries and the names of the professors. These documents indicate that the professor of mathematics was Francesco Ottonaio of Florence, who had occupied the same chair at Mondovì. Other documents testify that the same person held the chair of mathematics in 1573 and in 1585/6. It is therefore hard to believe that Benedetti was professor in this subject before 1586, as several secondary sources contend.⁷⁵ As to his alleged position at Mondovì, that university was opened by Emanuele Filiberto in 1560 and then transferred to Turin in 1566, that is, before Benedetti’s arrival at the Savoy court. Thus, it must be excluded as a possibility that he ever taught there, contrary to the claim made by Tonso. It is possible though, even likely, that he acted as an external advisor on matters concerning the university.⁷⁶

Turin had fewer academies than other centers such as Rome, Naples, and Florence, although it was a typical Renaissance phenomenon to establish academies, circles of learned men who met to discuss issues pertaining to literature, the arts, or the sciences, and who published works representative of their common intellectual efforts. Apart from two minor academies (“*de’ Solinghi*” and “*degl’Impietriti*”), Carlo Emanuele I conceived the project of forming an academy guided by the Jesuits around 1585. Bonifacio Vannozi, a man of letters from Pistoia, described it as follows:

His Highness, the very serene [duke] of Savoy, had the wish to found an academy in this august town of Turin. He charged three Jesuit Fathers of the renowned College with the task. Although they are generally sober of mind, in this case they were so intemperate as to entrust myself [with this endeavor] although the overwhelming responsibility [*machina da incurvar le spalle*] would be excessive for even the most competent person. His Highness has made himself Prince, Protector, and Head [of the academy], in order to attract a good deal of his courtiers [into the academy] who are so cultivated

⁷²Tonso 1596, 141: “Neque vero liberalium disciplinarum omniumque artium colendarum quam suscepit cogitationem unquam deposuit: nam et publicum earum Gymnasium pro tempore in oppido Montereali instituit: et qui viri in quacunque scientia excelleret undique conquisuit. [...] Mathematicos illustres Franciscum Othonarium, et Io. Baptistam Benedictum Venetum.”

⁷³Bordiga derived this information from a manuscript of Cristini’s preserved in the Biblioteca Marciana in Venice. See Bordiga 1926, 596–597.

⁷⁴The historian of Piedmontese Universities Silvio Pivano complained already in the 1920s about the lack of relevant documents. Pivano 1928, 19–22.

⁷⁵See, e.g., Bauer 1991, 156–157.

⁷⁶Roero 1997, 65, n. 5. Evidence for Benedetti’s role as an advisor in university matters can be found in Patrizi’s correspondence, as already mentioned.

and refined that, if one adds to it the splendor of the arts [lettere], there will be no court in Europe more illustrious than this one. Our name is 'Incogniti.'⁷⁷

In spite of the initial impetus, this academy was not particularly successful and did not leave significant traces of its activities. Perhaps it was negatively affected by the fluctuating relations between the Crown and the Jesuit order.

Emanuele Filiberto also created a *Theatrum omnium disciplinarum*, which was realized for him by Ludovic Demoulin de Rochefort. It is not completely clear what this theater contained. It was probably a *Wunderkammer*, as Mamino argued.⁷⁸

In March 1572, duke Emanuele [Filiberto] established in Turin a museum [*theatrum*] of all disciplines [organized] in marvelous order and at a very high cost. Archbishop Gerolamo della Rovere and the philosopher Ludovic Demoulin de Rochefort, the most educated men in all fields, cared for it.⁷⁹

Moreover, the dukes supported editorial activities. Emanuele Filiberto first called the Flemish printer Laurens Leenaertsz van der Beke, better known as Torrentinus, to Piedmont. Torrentinus had already initiated a printing house in Florence under Cosimo I., but he died shortly after his arrival in Mondovì (1561). Hence, in 1570, Emanuele Filiberto employed another printer, Niccolò Bevilacqua. This pupil of Manuzio founded the *Compagnia della Stampa* (Printing Company), which benefited from ducal privileges (a sort of editorial monopoly). The activity of Bevilacqua and his heirs culminated in 71 editions produced between 1578 and 1580, most of them on juridical subjects. Scientific issues were not neglected in Turin. Among the publications issued during the years of Emanuele Filiberto, between 1563 and 1580, books on scientific and natural subjects constitute about one fifth of the entire production, that is, almost as much as literary publications.⁸⁰ They also printed several books by Benedetti, including the *Diversae speculationes*.

2.7 Scientific Debates

2.7.1 Courtly Conversations

Renaissance Turin was a center of lively cultural and scientific debates taking place in different institutional settings, at court, at the university, and in town. The printing press was a powerful means for public discussion, dissemination of ideas, and criticism. Printed sources are evidently our main source of information about the intellectual debates or polemics that animated Turin in Benedetti's time.

⁷⁷Tiraboschi 1824, 289–290: “L’Altezza di questo Serenissimo di Savoia ha desiderato, che si dia principio a fondar un’Accademia in questa sua Augusta città di Turino, et n’ha data la cura a tre Padri del Gesù di questo insigne Collegio, i quali, non so da che allucinati, soliti però a non s’abbagliare, hanno fatto gran fondamento nella persona mia, caricandomi d’una macchina da incurvar le spalle, quantunque gigantesche. S.A. se n’è fatto Principe, e Protettore, e Capo, per tirarvi buon numero de’ suoi Cortigiani, tanto culti e fioriti nel resto, che, se vi si aggiugne l’ornamento delle belle e delle pulite lettere, non sarà Corte in Europa più rilucente di questa. Il nostro nome è degli Incogniti [...]”

⁷⁸Mamino 1992 and Mamino 1995. By contrast, Cibrario thought that it was an encyclopedic project. See (Cibrario 1839).

⁷⁹Pingone 1577, 88: “Anno Christi 1572 mense Martio, Emanuel Dux Taurini theatrum omnium disciplinarum miro ordine, nec minimis sumptibus instituit, curantibus Hieronymo Ruvereo Archiepiscopo, et Ludovico Molineo Rochefortio Philosopho, viris in omni doctrinae genere absolutissimis.”

⁸⁰On Renaissance publications in Piedmont, see Bersano Begey 1961, especially vol. 1. See also Merlotti 1998.

First of all, we should consider courtly debates. A circle of intellectuals gathered around the Savoy family. The professor of jurisprudence, Bernardo Trotto, depicted the relationship between the rulers and their learned courtiers as follows:

These learned men, played by the Prince like well-tuned musical instruments, immediately give out their specific sounds with words. And they give it their best to be clearly understood in conversations, to please the others with good arguments and to convince them of their opinions. It is like the consonance of truth. In fact, everyone says what one knows or, at least, considers to be true. Hence they discuss natural issues and at times moral ones and mathematical ones. In conclusion, one can regard him [the prince] as Apollo surrounded by the Muses near the water spring that was born from the hoof of Pegasus.⁸¹

A reflection of the intellectual climate and the topics addressed in such informal meetings is a poem by the court physician Arma, *Proposte tenute co'l Serenissimo Prencipe* (Issues Discussed with the Very Serene Prince), printed in Turin in 1580. In this tiny book, addressed to Emanuele Filiberto, Arma reported a discussion on meteorological problems that took place between Carlo Emanuele I, Benedetti, Ottonaio, Berga, and himself during the prince's meal for three successive days. On the first day, Carlo Emanuele I asked the reason why the sun heats. Arma used Plato to argue that its body is not warm but that it heats through the percussion of its rays on terrestrial elements.⁸² The next day, Arma had a quarrel with Benedetti, Berga, and Ottonaio concerning "solar attraction."

The day after, Mister Benedetti
And Mister Berga, along with Ottonaio
Expressed opinions that are far from mine:
That the Sun attracts everything to itself with its great brightness
As if it had hands.⁸³

Arma objected that, if the sun attracts other bodies, this would be very inconvenient for its inhabitants, the solarians (*solari*). The argument is not clear and the reader is only informed about the fact that Benedetti agreed with him.

During the conversation, Ottonaio mentioned the vapors brought upward by the sun's action. Accordingly, the next topic of discussion concerned natural places and elemental displacements with reference to the behavior of vapors.

⁸¹Trotto 1625, 2–3: "[...] questi huomini saputi, tocchi dal Prencipe, come instrumenti musici bene accordati, subito rendono ciascuno il suo suono con le parole et quanto meglio possono procurare d'essere intesi discorrendo, e di dar diletto con le buone ragioni, et anco di tirare gli altri al suo parere, come ad una consonanza della verità: perché ognuno dice quello ch'egli sa o crede almeno sia vero. E quindi si veggono trattare hor cose naturali, hor morali, hor mathematiche. Sì che egli quasi come uno Apolline si può dire, che sta fra le Muse, intorno al fonte, che uscì dal colpo del piede del cavallo alato." On Trotto's teaching, see Vallauri 1846, 28 and 48–49.

⁸²Arma 1580a, f. A2r: "Scalda co raggi [...]/ Sbattendo la Terra di caldo priva. Si com' il martel che bate l'incudine./ Riscalda l'un e l'altr' in certitudine."

⁸³Arma 1580a, f. A2v:

"Il Signor Benedetti l'indomani
Col signor Berga, insiem' a l'Ottonaglio
Forn' in pensier' a me d' assai lontani,
Che'l Sol tirass' a sé com grand' abbagio
Ogni cosa si com' havesse mani."

On the third day, the prince asked about the origin of lightning, and why we perceive their light before we hear the thunder. Arma answered that our sight is much quicker than our hearing, but this remark was received with skepticism by his colleagues. No details are reported about the objections that should have concerned the theory of perception, light, and optics.

The next issue was colors and the rainbow; Benedetti asked about the center of the rainbow's arc and Arma offered the following answer:

Benedetti, as an expert master of his art,
 Asked me about the center of the arc [of the rainbow].
 I answered that it was on the vertical line
 Descending downward from the center of the heavenly body,
 As was the opinion of Zoroaster.
 And with this answer I got rid of him.⁸⁴

At the end of this three-day conference, all opinions were written down for the prince and signed by the ducal advisors:

All of this was presented in written form
 To His Highness, reporting all speeches.
 Dr Berga confirmed it [the rightness of the report].
 Benedetti did the same.
 After that we discussed other issues,
 Occult things and their effects.⁸⁵

Other publications also mention such table talks at court. For instance, the physicist and philosopher Bucci wrote in the preface to his book on physiology, *Disputatio de principatu partium corporis* (Disputation on the Superiority of Parts of the Body, 1583), that his discussion about whether the heart or the brain held superiority in the body, and about the localization of the soul, originated from a table talk. On a certain occasion, in fact, Carlo Emanuele I had gathered his learned courtiers and addressed these issues. Among the participants, including several physicians, Bucci also mentions the “mathematicians,” Ottonaio and Benedetti.⁸⁶

⁸⁴Arma 1580a, f. A4r:

“Il Benedetti, come degno maestro,
 Mi dimandò d’il centro di tal arco.
 Dissi, che gliera col centro de l’Astro,
 Ne la medema linea giù scarco.
 Si com’anchora volse Zoroastro.
 E con tal dire di lui mi discarco.”

⁸⁵Arma 1580a, f. A4r:

“E tutto quest’ in scritti fu donato
 A Sua Altezza, con tutti soi detti.
 E fu dal Dottor Berga conformato.
 Il che fece’l signore Benedetti.
 Fu poi d’altre proposte ragionato
 E de gl’occolte cose, e soi effetti.”

⁸⁶Bucci 1583, 7–8. See Mammola 2013, 6–8.

2.7.2 Academic and Scholarly Controversies

Scholarly controversies and polemics on various issues and with very different tones were printed in Benedetti's years. While courtly debates had a polite and entertaining character, academic disputes could be more vehement. However, the two contexts were not always neatly divided. In 1572 two professors of philosophy, Berga and Bucci, held divergent opinions concerning the interpretation of Aristotle's *De anima*.⁸⁷ As Simone Mammola has argued, their disputes on that issue should be understood against the background of the Averroistic-Simplician debates on Aristotle's psychology started at Padua and continued at Turin by scholars such as Filateo and Vimercato. The Turin controversy over Aristotle's soul doctrine, which developed through academic disputations and publications, ranged from cognitive problems linked to the functions of the soul (such as the problem of the relationship between imagination and cogitation) to metaphysical and theological issues, e.g., the legitimacy of a reading of Parmenides's theory of being as a form of *prisca theologia*. The real issue at stake was the correct approach to the Aristotelian corpus based on different commentators.⁸⁸

The court physician Arma was at the center of several public controversies as well. In 1575, he defended the scientific status of medicine, traditionally considered "only" an art, in the programmatic book *Quod medicina sit scientia et non ars* (That Medicine is a Science and Not an Art). This writing was considered worthy of a second edition in 1585. In 1579, Arma entered a dispute against the professor of medicine Giovanni Costeo over the healthiness of bread made out of rice ("*pane fatto col decotto di riso*"). The two parties then issued a series of publications on this controversial topic.⁸⁹

Another polemic opposed Berga and Benedetti regarding the proportion between the earthly and the watery element of our globe. The debate was initiated by some questions Carlo Emanuele I asked his courtiers. While Berga stuck to the Scholastic view that the elements have an increasing quantity proportional to their distance to the center, Benedetti favored the merging of empirical and mathematical arguments as proposed by Alessandro Piccolomini. Piccolomini had come to the conclusion that the quantity of the earthly element is superior to that of the water element, as one can read in his *Della grandezza della terra e dell'acqua* (Venice, 1558).⁹⁰ Although Benedetti regarded Piccolomini's arguments as conclusive, Berga undertook to compose a Scholastic refutation of them, *Discorso... della grandezza dell'acqua e della terra contra l'opinione di S. Alessandro Piccolomini* (Turin, 1579). Part of his strategy was to eliminate arguments derived from the "misura dei cieli e della terra, dalla Scuola dei matematici immaginate," that is, from mathematical and empirical methods applied to this issue ("measurements of the heavens and the earth imagined by the school of the mathematicians"). Benedetti reacted with his *Considerazione... d'intorno al discorso della grandezza della Terra, et dell'Acqua. Del Eccellent. Sig. Antonio Berga Filosofo nella Università di Torino* (Consideration... on the discourse concerning the dimensions of earth and water by the excellent Mr. Antonio Berga, philosopher of the University of Turin, Turin, 1579). In it, he applied mathematics to show that, even if the entire earth were covered by water, the volume of the terrestrial

⁸⁷Bucci 1572 and Berga 1573.

⁸⁸See Mammola 2013.

⁸⁹Merlotti 1998, 585: "Come s'è visto per la polemica fra Costeo e Arma [...] non si trattava di isolati testi a stampa che generavano dibattiti destinati a rimanere manoscritti e chiusi nell'ambito degli eruditi, ma semmai del contrario: di discussioni, cioè, sorte in circoli ristretti di medici e scienziati, prima affidate a manoscritti e poi trasportate a stampa a vantaggio d'un più vasto pubblico."

⁹⁰For an accurate reconstruction of the polemic and its cultural and scientific context, see Ventrice 1989, 103–145 and Mammola 2014.

element would not be inferior to that of water since the depth of seas and oceans is small in comparison to the terrestrial radius. The oceanic navigations, the geographical explorations, and the European colonization of the globe during the fourteenth and fifteenth centuries had indisputably demonstrated that water and earth constitute one single globe, a unique *globus terraqueus*.⁹¹ This cosmographical advance had been the basis for Piccolomini's considerations, which met with considerable success and agreement among scholars. On such issues, as Benedetti stressed, experience and mathematical reasoning should be joined:

Very serene Prince, the discovery, after two thousand years, that the [element] earth is much more than the [element] water (for which we are greatly indebted to the very learned Mr. Alessandro Piccolomini) very much pleased the spirits of the most renowned philosophers of our time. In the past, they did not dare to depart from the false doctrine they had imbibed for many centuries, although it was sustained by implausible reasons. Today they are glad to embrace the opposite opinion [concerning water and earth], because both the senses and reason are in accordance with the [new] demonstration of the truth. The ancient mistake has been unveiled by the mathematical school with very certain proofs that offer a firm foundation of the measurement of the heavens and the Earth.⁹²

The dispute continued with the Latin translation of Berga's writing by Francesco Maria Vialardi (1580) and a skeptical intervention by Arma. The latter was a poem dedicated to Carlo Emanuele I, entitled *Stanze del dottore Arma al serenissimo Carolo Emanuele di Savoia et Piemonte Principe, etc. suo signore sempre osservandissimo. Che l'acqua e la terra non si possono a modo alcuno misurar* (Doctor Arma's Stanzas to the Most Serene Prince Carlo Emanuele of Savoy and Piedmont, His Perpetually Honored Lord, 1580). The composition is poor both from a stylistic viewpoint and a scientific one. The courtly physician could only point out the uncertainty of human knowledge and the wisdom in measure gifted by God to creation, although he also stated we cannot grasp the latter: "The Creator gave it a measure,/ Which cannot be grasped by any creature."⁹³ Benedetti addressed the issue again in one of the letters of the *Diversae speculationes*.⁹⁴

2.7.3 Astronomical-Astrological Polemics

In Renaissance Turin, astronomical and astrological issues were at the center of intense debates and even polemics. In 1578 the protophysician Arma was the target of a denigrating pamphlet in twenty points. An anonymous author attacked a booklet of his on the comet that had just appeared. As we know from indirect evidence, Arma had written one or two treatises on this issue. One was entitled *De significatione stellae crinitae*.⁹⁵ Perhaps it has

⁹¹ Vogel 1993.

⁹²Benedetti 1579, 3: "[...] l'essersi doppò due mila e più anni scoperto con trionfo della verità, che la terra è molto maggiore dell'acqua, (del che si ha da haver grande obligo tra gl'altri al dottissimo Signor Alessandro Piccolomini) ha non poco rasserenato, Serenissimo Principe, l'animo de' più famosi Filosofi di nostra età; i quali, sì come prima non intendeano dipartirsi dalla già imbevuta falsità, e per molti secoli adietro, benché con inefficaci ragioni difesa, così hora si lasciano volentieri persuadere il contrario; poiché il senso, e la ragione s'accorda alla dimostrazione del vero. E nella scuola de Mathematici per certissime prove si scuopre l'antico errore, puotendosi far fondamento stabile delle misure de cieli, e della terra."

⁹³Arma 1580b: "Il Creator gli diede tal misura./ Che saper non si può da creatura."

⁹⁴Benedetti 1579, 397–405, "Defensio nostra contra Antonium Bergam, et Alexandrum Piccolomineum." See Ventrice 1989, 131–134.

⁹⁵This information stems from Bonino 1824–1825.

to be identified with a composition in verses, referred to as *πωγωνία* (bearded comet) in the anonymous pamphlet. The only remaining evidence of the cometary polemics is a defence of Arma, *La Stravagantographia del Sig. Filosofo stravagante, in difesa de la πωγωνία d'il Dottore Arma* (The Stravagantography of Mr. Stravagant Philosopher in Defence of Dr Arma's Bearded Comet).⁹⁶ The apologist was one Monsignor Della Torre linked to the court. His apology offers an insight into the controversy: It concerned astronomical and meteorological issues relating to the nature of the comet, its location below or above the sublunary sphere, the criticism of astrological interpretations of the celestial phenomenon, as well as personal insults. The provocateur who had published against Arma is depicted as follows:

I cannot stop wondering who this person is. I cannot understand why he sometimes presents himself as a scholar, sometimes as a cook, as a Roman courtier, or as a practicing friar [*frate osservantino*] (as he speaks about the *osservantini*). I cannot believe that he is a practicing [man of religion], as the ecclesiastics speak in a correct manner and not heedlessly like him (who behaved heedlessly). Moderation has always been praised. Therefore, moderate people will always damn this person. I will never believe that he is a scholar. In fact, today's scholars are well-educated and would never indulge in such excesses, especially against such a man [Dr. Arma] from whom they did not receive anything but pleasure, honor, and courtesy. Although he seems to come from the area of Rome, in the end he shows himself to be a dishwasher because even a cook would behave better than him. Whoever the hell he is, if he will not control himself better in the future, I will repay him as he deserves.⁹⁷

Possibly the identity of this mysterious denigrator was the philosopher Giordano Bruno, who was in Turin in 1578 on his way to Chambéry, in Savoy. At that time he wore the Dominican habit and had just published, as mentioned above, a booklet on meteorology in Venice entitled *De' segni de' tempi* (On the Signs of the Times) that presumably dealt with the comet.⁹⁸ The reference to the provocateur as a Roman courtier could correspond to an episode of Bruno's life. In Paris, in 1585, he told the librarian Guillaume Cotin that he had been once received at the Roman court by Pius V and the Cardinal Rebiba to whom he demonstrated his technique of the art of memory.⁹⁹ Moreover, the Turin episode resembles a *querelle* that burst out in Geneva in 1579, after the publication of a pamphlet in twenty points ridiculing a professor of philosophy. The detractor, Giordano Bruno, was discovered and condemned to exclusion from communion. As one reads in a document (6 August 1579), "Philippe Jordan, dit Brunus, Italien [était] détenu pour avoir fait imprimer

⁹⁶It is preserved in the Biblioteca Reale of Turin, coll. G 25–67.

⁹⁷Della Torre 1578: "[...] non mi posso quietare pensando chi possi esser costui. Non posso capire, perché quando fa d'il scolaro, quando del cuogo, quando del corteggiano di Roma, quando del frate osservantino, poi che di osservantini parla. Di esser osservante, nol posso pensare, perché li religiosi parlano correttamente, e non si s governano nel parlare, come ha fatto costui, il quale mattamente si è s governato. Fu sempre lodata la modestia. Sarà dunque dalli modesti dannato costui. Che sij scolaro, non lo crederò mai, perché hoggi di li scolari sono ben creati e non farebbono tale scappate specialmente contra di un'huomo tale da cui mai hebbero altro che apiacere, honor e cortesia. Par bene che habbi del Romanesco nel principio, ma il fine dimostra più presto haver del sguattero, perché il cuogo si sarebbe meglio deportato che non fa costui. Sij chi diavol esser si voglia. Se esso per avanti meglio non si governerà, tale e tanto mi ritrovarà, quale e quanto mi ricercherà."

⁹⁸See Omodeo 2008a. On Bruno's lost meteorological-cometary work, see Ernst 1992.

⁹⁹Spampanato 1921, 654–655 and Ricci 2000.

certaines responses et invectives contre Mr. de la Faye, cottans 20 erreurs d' iceluy en une de ses leçons.”¹⁰⁰

Only one year later, between 1580 and 1581, Benedetti was involved in an astronomical-astrological quarrel with a certain Benedetto Altavilla of Vicenza concerning the reliability of ephemerides and astrological prognostication. The controversy was sparked by the publication of Altavilla's *Animadversiones in ephemeridas* (Remarks against Ephemerides, 1580) and was continued with two further publications by the same author.¹⁰¹ They cast the reliability of ephemerides' calculations and astrological forecasting into doubt, based on the alleged theoretical flaws of mathematical astronomy. Since they appear to have been directed against scientists linked to the court, Benedetti eventually intervened with a printed letter, *Lettera per modo di discorso... intorno ad alcune nuove riprensioni, et emendationi, contra alli calculatori delle effemeridi* (Turin, 1581). He later translated it into Latin as *Defensio ephemerides* and included it in the miscellanea of epistles of the *Diversae speculationes*. We will expand on this polemic later, in the section on Benedetti's astronomy.

2.7.4 Posthumous Criticism: Cristini on Benedetti

Benedetti died on January 20, 1590, two years before his own astrological prediction. This untimely death did not leave him the time to complete the astrological work that he announced at the end of the *Diversae speculationes*. What is worse, the fact that his own prediction was wrong awakened doubts and rumours about his scientific talent. The mathematician Cristini was quick to compose a critical essay, entitled “Examination of the mistake and emendation of the nativity of the very excellent mathematician, Mr. Giovanni Battista Benedetti, now deceased, to account for his [wrong] prognostication of his own death two years later than it in fact occurred” (*Essaminatione dell'errore, della rettificatione de tempo della natività del fu S[ignor] Gio[vanni] Battista Benedetti mathematico eccellentissimo, per cagion del quale esso s'era pronosticato morte due anni appresso in circa al tempo che gl'è avvenuta*). Although the manuscript was lost in the fire of the Biblioteca Nazionale of Turin in 1904,¹⁰² a transcription of significant parts by the eighteenth-century biographer of Cristini, Giuseppe Vernazza, is still extant in the Biblioteca Reale of Turin among the documents that Vernazza gathered for the composition of his *Notizie di Bartolommeo Cristini* (Notes on Bartolomeo Cristini, 1783).¹⁰³

Cristini started his examination of Benedetti's errors with specific reference to his mistaken self-prognostication in the *Diversae speculationes*. He also reported that Benedetti himself acknowledged an error in his nativity, amounting to four minutes. After that, Cristini took upon himself the task of recalculating that horoscope on the basis

¹⁰⁰Spampanato 1921, 132.

¹⁰¹On astronomical-astrological quarrels in Renaissance Italy and Turin, see Omodeo 2008a and Tessicini 2013.

¹⁰²Bordiga 1985, 609, n. 6. See Omodeo 2014c.

¹⁰³Vernazza 1783. Two manuscript copies of Vernazza's biography of Cristini are still extant. One is preserved in the Turin State Archive (Archivio di Stato di Torino, coll. Miscellanea J.b.VIII. 9), the other is kept in the Biblioteca Reale of Turin (Vernazza manuscript, misc. 67.5). The latter is a good copy, ready for the printer. It contains an appendix of “documents” for the personal use of the author. These are transcriptions or translations of significant passages of documents by Cristini that were lost or seriously damaged after the fire at the Turin National Library in 1904. They comprise the dedication and table of contents of the *Revoluzione trentesimaterza del Ser[enissimo] Sig[nor] il Signor Carlo Emanuele duca di Savoia* (1596), notes from various astrological diaries, an Italian version of the beginning of *La rithmomachia o sia gioco di Pithagora* and, most importantly, a long extract from the *Essaminatione dell'errore... della natività del fu S[ignor] Gio[vanni] Battista Benedetti mathematico*.

of the figure published by Gaurico and came to the conclusion that the mistake was even bigger. It amounted to eight minutes.

Benedetti published his prognostication of the moment of his death in the work entitled *Diversarum speculationum mathematicarum et physicarum liber* (published in 1585), in a letter to the most illustrious Wolfhard Eisenstein [Volfardus Aisenstain], which is to be found at the end of this work. After a brief assessment of those things of the judicial art that he regarded as vain or false, and after announcing to Wolfhard that he would expand [on astrology] in that tract with his astrological observations, which he wished he could publish before his death, he added the indication of the time in which, according to him, [his death] was to happen (that is, [the date] before which he wished he could publish the aforementioned tract). These are his words: “antequam ad directionem mei horoscopi cum corpore Martis anaeretae perveniam, quae quidem directio circa annum millesimum quingentesimum nonagesimum secundum evenienti” [as indicated by my horoscope, before I meet the body of the adverse Mars. This is going to happen in 1592].

As we can see, he was certain that he would die when the direction of his ascendant and Mars would meet. He calls [Mars] “anaereta,” that is, giver or announcer of his death. He confirmed this when [...], just before his death, he felt that the disease was attacking him and declared that he made a mistake of four minutes in the rectification of the time of his birth horoscope [*natività*]. This is as if he would say that, by augmenting by four minutes the time of his birth horoscope, he would have predicted the direction [of his ascendant sign meeting Mars] at about the time when he became sick. Hence, he believed he was dying, and this [his death] in fact occurred at the end of the ongoing year 1590, at 17:00 of 20th January according to [the calendar of] Gregory, which corresponds to the 10th of the old [calendar]. I had to know the time in which he believed he was born in order to assess by how much time he was mistaken in the rectification of his birth horoscope, so that the direction of his horoscope relative to Mars corresponded to the days when he left this world. Therefore, at Benedetti’s death, I immediately began to compute the error of the aforementioned time, though only approximately, because I did not know Mars’s latitude. And I found that it [the mistake] amounted to eight minutes [...]. Later, when the same person who told me that Benedetti had acknowledged a mistake of only four minutes according to his calculations, openly accused me of not being able to do this calculation, as my mistake was two times [that of Benedetti], I began the calculation in the following manner. First, I determined the time attributed to his birth [...] Etc.¹⁰⁴

¹⁰⁴From Vernazza’s papers accompanying his manuscript of his *Notizie di Bartolommeo Cristini*. Biblioteca reale di Torino, Misc. 67.5, *Vita di Bartolomeo Cristini con documenti*, “M.S. L. 1.10, 11.493, di pag. 42.” See Omodeo 2014b: “Ha pubblicato il Benedetti, il pronostico fattosi del tempo di sua morte nell’opera sua titulata *Diversarum speculationum mathematicarum et physicarum liber* stampata dell’anno ’85 in una lettera scritta all’ill.mo Volfardo Aisestain, posta nel fine d’ess’opera, perciocché appresso haver brevemente dichiarato quali cose egli stimava vere nella giudiziaria e quali vane o false, et detto com’esso Volfardo potrà veder poi meglio in quel trattato dell’osservationi sue astrologiche, quale sperava dar in luce avanti la sua morte, soggiunge il tempo il quale giudicava essa doverli avvenire, o sia avanti al quale desiava publicar detto trattato, con queste istesse parole: “antequam ad directionem mei horoscopi cum corpore Martis anaeretae perveniam, quae quidem directio circa annum millesimum quingentesimum nonagesimum secundum evenienti.” Donde appare ch’esso teniva per certo d’haver a morire, quando giungerebbe alla

In his transcription of Cristini's *Essaminatione dell'errore*, however, Vernazza omitted numbers and calculations. These can be found in another astronomical-astrological assessment and criticism of Benedetti entitled "Thirty-first revolution of the very serene Sir, Duke Carlo Emanuele of Savoy, for the year 1592, very diligently and reliably calculated and explained by Bartolomeo Cristini, scholar of mathematical disciplines in the service of His Highness, according to the best opinion of the main judiciary astrologers" (*Revolutione trentesima prima del Serenissimo Signore il Signor Carlo Emanuel Duca di Savoia corrente dell'anno 1592 con ogni diligenze et fedeltà calculata et decchiarata secondo le migliori intelligenze de più principali autori dell'astrologia giundiciaria per Bartolomeo Crestino studioso delle mathematiche discipline in servizio di Sua Altezza*). Although the manuscript was damaged by the fire of the Turin library in 1904, it is still readable. The dedicatory letter shows that, at the time of its composition (June 8, 1592), Cristini was striving to obtain a stable appointment at court:

But your very generous Highness awoke in my spirit the desire of mathematical virtues and of undertaking the present endeavor. Your request woke up and unveiled in me the desire (which is always alive) to serve [Your Highness]. However, my desire has been impeded by the difficulties of my continuous poverty and adverse times owing to the fact that no treasurer (or any monetary and financial administrator) regards me as an ordinary servant of Your Highness. [I have been acknowledged as a servant] only in exceptional cases, when my capacity, readiness and knowledge in making calculations has proved useful—as has happened several times, when I was required to serve Your Highness. [...]

Therefore, I place growing hope only in Your Highness the more [you] require my services, the more efforts I make for You and the fewer are the number of [benefactors] by whom I can hopefully be supported¹⁰⁵

direttione del suo ascendente al corpo di Marte, quale chiama anaereta cioè datore, o promissore de la morte sua. Il che pare habbi volsuto confirmare quando che, come dice, poco avanti la sua morte ei si sentì carrigar dal male, disse d'essersi fallato di quattro minute nel rettificare il tempo di sua natività, perché questo è come s'havesse detto che quando egli havesse accresciuto tempo di sua natività per quattro minute havrebbe conosciuto la direttione predetta essere minore di quello [che] l'haveva fatta, et per ciò il tempo della sua morte caggionata da essa direttione dover essere circa questo tempo, ch'egli s'era infermato, et credeva di morire come è pur avvenuto, essendosi occorso ciò fare dell'anno presente 1590 circa le 17 hore del 20 giorno di genaro secondo Gregorio, che viene ad essere il dieci dell'anno antico. Perciò volendo io esaminare di quanto tempo egli habbi fallato nella rettificatione di essa sua natività, accioché giustamente la direttione predetta dell'horoscopo suo al corpo di Marte venisse a cadere nel giorno istessi ch'egli partì da questo secolo, m'è stato necessario sapere il tempo ch'egli havea presupposto fosse quando nacque [...]. Perciò mi posi subito seguita la morte del Benedetti a far conto dell'errore del tempo predetto, così alquanto alla grossa, per non haver nota la sopradetta latitudine di Marte, et ritrovai detto errore essere di minute otto in circa di hora [...] Ma perché ho dipoi inteso che chi mi ha riferito il Benedetti haver confessato il detto fallo di min. 4 et haver solamente ritrovato tanto per calcolo ha espressamente detto che io errava del doppio et non sapea far questo conto [...] mi posi a calcolare di questa maniera. Prima ho ritrovato il tempo presupposto della natività [...] Etc."

¹⁰⁵Cristini, *Revolutione*, Biblioteca Nazionale Universitaria di Torino, N. VII. 10, f. 4r-v: "Ma V[ostra] Alt[ezza] benignissima sì come è stata cagione d'eccitar nell'animo mio il desio delle virtù matematiche, et di farmi fare la presente fatica; così ancora co'l chiamarmela adesso ha risvegliato, o riscoperto le sempre vive brame mie di servirla, le quali erano tenute sepolte dai disaggi che queste carestie et mali tempi mi causano maggiori giornalmente, per ciò che non sono conosciuto per servitore ordinario di V[ostra] Alt[ezza] da Tesoriere alcuno, né da ministro di suoi dinari o finanze; se non ne' casi che la virtù et prontezza, o cognizione mia ne' conti, può reccarli qualche giovamento come ha fatto più volte quando per servizio di

In this case, the allegation against Benedetti is for using the Alfonsine tables to determine the nativity of Carlo Emanuele I, instead of more reliable Copernican tables. Such inaccuracy invalidated his astrological judgments.

I took into account the places where they [the planets] are to be found in the horoscope made according to the true time calculated on the basis of Copernicus, following the teaching of the major authors on astrology. In general, since scholars are in disagreement concerning the employment of different tables to compute their horoscopes [*revolutioni*] and although I have demonstrated (in the calculations at the beginning of my tract) that only one set [of tables] is true, I calculated the astrological figures of the heavens according to both tables—in fact, false ones were also in use by many and in particular by Benedetti—and I offered double astrological judgments depending on the places assigned according to the different figures. In this manner, your Highness will possibly compare them and see which ones are in better agreement with the truth.¹⁰⁶

The terms of Cristini's polemics echoed those of the controversy of the years 1580–1581 between Altavilla and Benedetti. In fact, Cristini examined two astrological figures calculated by Benedetti: a nativity based on the “Copernican” tables of the German astronomer Erasmus Reinhold, *Prutenicae tabulae* (1551), and a prognostication based on the Alfonsine tables.¹⁰⁷ He pitted these figures against a “figure that is computed from Giovanni Antonio Magini's tables of the second celestial mobiles” (*figura della natività di novo da me calculata con le tavole de secondi mobili celesti di Antonio Magini*) and a “figure of the revolution that I calculated according to the time of the real motion indicated in Magini's's ephemerides” (*figura della revolutione da me calculata sotto il tempo che si trova per il moto vero insegnato nell'effemeridi del Magini*).¹⁰⁸ Finally, he discussed the differences between his and Benedetti's calculations and concluded with an accusation directed against Benedetti for being careless and opportunist:

But I believe that he [Benedetti] followed the calculation of Alfonso X rather than the true one only owing to its simplicity. In fact, before [the publication of] the ephemerides of Magini it was very difficult to establish the true time of the revolution. Before him, nobody calculated the Sun up to the seconds in any ephemerides, which is the presupposition for more exact and true computations [...]. It is only in consideration of Benedetti's authority that I did not omit to compare his horoscope with the other one.¹⁰⁹

V[ostra] Alt[ezza] sono stato da loro richiesto [...].

Et per questo sempre cresce maggiore la speranza mia, in solo vostra Altezza quanto ch'essa più m'incita a servirla, et che maggior è fatica che faccio per lei, et minor il numero di quelli in quali posso haver speranza di soccorso.”

¹⁰⁶Cristini, *Revolutione*, Biblioteca Nazionale Universitaria di Torino, N. VII. 10, f. 8r: “[Ho] havuto riguardo ancora ai luoghi ne' quali cadono essi [pianeti] nella figura della revolutione fatta secondo il vero tempo dato dal Copernico, come è insegnato da principalissimi scrittori dell'astrologia. Et nell'universal giudicio perché ho conosciuto tra scrittori essere certa diversità seguendo alcuni un tempo et altri un altro nel fare delle revolutioni delli quali ancor ch'io provi (come per i calculi di ciascuno posti al principio di questa opera) l'uno solo essere il vero, ho fatto le figure del cielo che si mostrano sotto ambi essi tempi (atteso che ancor la falsa era seguita da diversi et particolarmente dal Benedetti), ho radopiato essi giudici per i luoghi che diversi significati fanno havere esse figure. Accioché V[ostra] Alt[ezza] provandole ambidue conosca ancor lei quale meglio secondi la verità.”

¹⁰⁷Cristini, *Revolutione*, Biblioteca Nazionale Universitaria di Torino, N. VII. 10, ff. 11v–12r.

¹⁰⁸Cristini, *Revolutione*, Biblioteca Nazionale Universitaria di Torino, N. VII. 10, ff. 12v–13r.

¹⁰⁹Cristini, *Revolutione*, Biblioteca Nazionale Universitaria di Torino, N. VII. 10, f. 16v–17r: “Ma io tengo ch'egli seguisse più tosto il calculo d'Alfonso che il vero; solo per causa della facilità d'esso perciòché avanti

In this second criticism, Cristini continued to discredit Benedetti. This time he cast his capacity as both an astrologer and a mathematical astronomer into doubt. Cristini suggested, in fact, that Benedetti misused his prestige to disguise the lack of accuracy in his astrological computations. Mistakes affected not only the horoscope he carried out for himself but also those cast for his patrons.

Once he had established himself as an expert in the field, Cristini continued to prepare prognostications for the ruling family from 1592 to 1595, as testified to by the titles of several manuscripts, such as “*diari*” and “*revolutioni*,” which are for the most part lost.¹¹⁰ He obtained the position at court that he desired in 1594. Carlo Emanuele I designated him “as our and our princely children’s mathematician, follower of Giovanni Battista Benedetti, who has recently passed away” (*per mathematico nostro et dei principi nostri figliuoli in luogo del fu Gio[vanni] Battista Benedetti ultimamente defonto*). He moreover accorded to the new court mathematician a “reasonable stipend” (*un ragionevole stipendio*) of three hundred scudi per year, “so that, according to our wish, he will cover the efforts of his studies, and will be in condition to serve us with more ease and comfort in all the duties we will entrust him” (*acciò che possi comportar alle fatiche delli studi, et trattenersi al servizio nostro più agevolmente et commodamente come desideriamo in tutti li carighi che ha da noi*).¹¹¹

2.8 Strengths and Limitations of the Institutional Framework of Benedetti’s Science

Benedetti’s life, career, and work, as well as his legacy, fortunes, and misfortunes should be understood against the background of the Renaissance world he was part of, in particular the Italian and Turin environments. His case is paradigmatic of both the strength and the limitations of Renaissance science. On the one hand, the cultural and economic flourishing of centers such as Turin, new and challenging engineering and architectural projects, and the establishment of a court and of a modern state apparatus with its need for technical advice and cultural grandeur created an exceptional environment, favorable also to the pursuit of science and philosophical speculations. The constraints of Counter-Reformation culture did not affect the speculative freedom of Benedetti. This is especially due to the pragmatic cultural and religious politics of the Savoy dukes, who were trying to establish a balance between their state and international diplomacy and confessional tensions. On the other hand, however, the fragility of Renaissance knowledge institutions also comes into view. Universities were teaching institutions instead of research centers. Professors were concerned with the transmission of knowledge rather than with the implementation of new knowledge and theories. The intended mission of early-modern universities was preservation, namely the transmission of traditional knowledge to future generations, not producing change. Thus, epistemic processes in institutional settings were often imperceptible and transformations of knowledge often occurred against the explicit intentions of the historical actors. Lectures and commentaries on authoritative sources—the teaching of which was sanctioned by academic statutes and curricula—were not expected to alter the knowledge preserved in the classics and in the textbooks. The Savoy dukes tried to

l’effemeridi del Magini molto difficil cosa era trovar il tempo vero della revolutione perciocché nissuno avanti lui havea nell’effemeridi calculato il Sole sino alle seconde onde ne seguono i calculi più sottili e veri [...]. Con tutto ciò solo per l’autorità d’esso Benedetti non ho volsuto lasciar del tutto la consideration delle figura sua con l’altra come vedevasi.”

¹¹⁰See Peyron 1904, 617–618.

¹¹¹Vernazza 1783, 20–21.

attract prestigious professors to Turin and also supported, at least initially, the teaching of humanities according to the new standards set by humanistic philology. However, the place for free inquiry and innovation was outside universities. Benedetti's works, marked by original and unorthodox conceptions in physics, mathematics, and other disciplines, emerged from a courtly environment. Yet, this institutional frame proved ephemeral as it was dependent on patronage. It also had a strongly personal character, as it depended on informal exchanges within a system of unsystematic patronage. In Turin, modern scientific academies, with a stable body of investigators and statutes, had not yet made their appearance. Not even literary and artistic academies met with a particularly favorable environment.

Given this context, Benedetti's scientific activity, accomplished outside university and institutionalized settings, cannot but appear as occasional. In fact, it was linked to the contingency of courtly life, for instance to the requests for advice by the Savoy rulers or other patrons. This is the case with all of Benedetti's letters and with other publications, such as his writing on the calendar reform. He appears to have given expert advice on issues of cultural policy, such as university appointments, as well as on technical issues, and not least on matters of astrology. His construction of a fountain and of sundials, as well as his writings on technologies and gnomonics are directly connected to his role as a mathematical expert at the court. In the same function, he also entered debates and polemics animating Turin. Some of his interventions were friendly, for instance his exchanges on meteorology with other courtiers in the presence of members of the ruling family. His controversy with Professor Berga over the quantity of water and earth in our globe was more vehement but never harsh. Astrological polemics were the most virulent ones, as evidenced by Benedetti's publications against the critic of astrology, Altavilla. A constant feature of Benedetti's scientific work remains its occasional character. This is also reflected in the lack of systematic order in his *magnum opus*, the *Diversae speculationes*. Benedetti probably saw himself primarily as a courtier, participating in the cultural life of Turin as an exponent of the Savoy elite, and not as a scientist pursuing the immaterial glories of scholarly achievements. As a matter of fact, he did not primarily take upon himself the burden of a scientific effort going beyond the deliverance of brilliant booklets, short judgments, and advice on specialistic issues.

One astonishing aspect of Benedetti's intellectual activities is the lack of an enduring and explicit legacy. On the one hand, his conceptions clearly influenced contemporaries and followers in Italy and abroad. Among others, his impact is reflected in the positive opinions of Brahe and Kepler, in Galileo's reception of several insights of his mechanics and physics, and in the European circulation of his ideas on physics through Taisner's plagiarism. On the other hand, the lack of an enduring acknowledgment of his work is equally evident and seems to be linked to the fact that he was not able, and perhaps not even willing, to establish a school like the one set up by Commandino in Urbino, or by those later set up by Galileo in Padua and Tuscany. Not even in Turin did he benefit from lasting recognition. As we have seen above, his immediate successor as court mathematician, Cristini, even saw the denigration of his astrological and astronomical skills as an opportunity to obtain a visible position in town and start a courtly career.

In many ways, Benedetti is the mirror of his world, in particular of the courtly society he belonged to. His work can be seen as the embodiment of this context. His case is different from that of many other Renaissance scholars, who strongly identified themselves with their scientific work and output. For scholars like Galileo, for instance, the publication of their works had a functional aim in accessing the courtly milieu. In the case of Benedetti, he was already part of the patrician and aristocratic milieu for many reasons. His work is the product of courtly life rather than his entry ticket to it. The author disap-

pears (or almost vanishes) and leaves in his place a sort of collective author, which is not the scientific Republic of Letters, but rather the court itself, its institutions, its elites, its participants, and its networks. In this respect, Benedetti differs from the great protagonists of Italian Renaissance science. He is very far from the self-celebration of intellectuals like Cardano and Galileo. His work is no monument to himself but rather to his environment, ranging beyond the local boundaries of Piedmont and the Savoy. The Urbino school was also populated by scholars less concerned with their own ego than with science. However, in contrast with this school Benedetti conceived of himself as an innovator, rather than as a restorer of antiquity and classicism.