

Cambridge University Press

978-0-521-00884-6 - On Tycho's Island: Tycho Brahe, Science, and Culture  
in the Sixteenth Century: Abridged Paperback Edition

John Robert Christianson

Excerpt

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PART ONE

ON TYCHO'S ISLAND

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## INTRODUCTION

**T**HIS BOOK IS ABOUT POWER. It shows how one man, Tycho Brahe, used his powerful position to bend the lives of hundreds of others toward a goal that he deemed important: a new understanding of the cosmos. It shows how he established a new role for the astronomer as large-scale organizer, active reformer, and natural philosopher.

Patronage was his means to create structures of power and incorporate others into his program of reform. This book therefore examines the hierarchies of patronage and clientage that extended from the highest ranks of human society to the broad laboring masses, hierarchies that incorporated men and women skilled in science, technology, learning, and the fine arts to work with Tycho Brahe and take him as their role model.

He used his power and patronage to build teams of people working together to carry out his ends, so this book is also about teamwork, which it aims to show was essential to the birth of modern science. Newton once remarked that he could see far because he stood on the shoulders of giants. This book shows how much of seventeenth-century European culture rested on the shoulders of a late sixteenth-century giant, Tycho Brahe: scientist, natural philosopher, technical expert, and poet; connoisseur of music, courtly grace, and the fine arts; and one of the most innovative organizers known to history.

In sixteenth-century Europe, Tycho Brahe was the patron of science par excellence. Because his use of patronage goes to the heart of the transition from Scientific Renaissance to Scientific Revolution, this book is a case study of patronage during that key period. The first chapter deals with Tycho Brahe as client of the king of Denmark and differentiates the two types of royal patronage he received. Chapter 2 shows how he reorganized the island of Hven and brought all of its inhabitants into his system, linking their labors to those of his dependents in Norway and two provinces

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of Denmark. Chapter 3 focuses on theories of friendship that established reciprocal links with learned individuals throughout Europe and created an international support network for his work. Chapter 4 examines the structures of household and family as they were used by Tycho Brahe to shape his working staff. Chapter 5 shows how scientific expeditions, staff organization, the technology of printing, the fine arts, and the manipulation of objects and information in "museums" all served to reinforce reciprocal relationships of friendship and patronage while strengthening the pursuit of science and disseminating its results. Chapter 6 examines how the social linkage of patronage to family could shape the elements of continuity and discontinuity in sixteenth-century science. Chapter 7 looks at the problem of cultural conflict when scholars of various nationalities brought different mentalities and assumptions to their common work.

Chapter 8 shows how marriage strategies aimed to reinforce bonds of friendship and patronage, and how they could fail: The betrothal of Tycho Brahe's daughter, Magdalene Tygesdatter, was an attempt to bridge a gap between social classes, and its failure revealed much about the dynamics and the limits of late sixteenth-century social bonding. Chapters 8 and 9 show the importance of honor as a personal attribute, and how reputations could be destroyed and patronage lost in fierce battles between rival individuals, institutions, and ideologies. Chapter 10 deals with the difficult but not insuperable task of establishing new patronage relationships on the international level.

The scientific, research, and familial legacies of Tycho Brahe are discussed in Chapter 11, which brings Part One of this volume to a close. Part Two is a Biographical Directory, which sketches the careers of individuals who were drawn into Tycho Brahe's network of patronage or, in a few cases, of friendship.

Tycho Brahe is the richest example of scientific patronage and friendship in sixteenth-century Europe, but his structures of power and support interlocked within a broader cultural ambience that also needs to be examined. In his Latin poetry, Tycho Brahe described his island of Hven as *In-sula Venusinus*, a magical place where gods and goddesses dwelt on earth. The island's inhabitants lived and worked together in the Temple of Urania, devoting themselves to eternal matters and ignoring all lowly, earthly ones. In pursuing this elevated life, he asserted, they became like demigods. He said that visitors to the island had the privilege of experiencing the realm of the divine and left as better people. Such was Tycho Brahe's own description of a place that modern historians have seen as a crucible

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of the Scientific Revolution. The disparity between the way he understood what he was doing and the twentieth-century assessment of his scientific achievement is quite astounding.

An important task of this book is therefore to focus upon the lives of Tycho Brahe's coworkers in order to see who these "demigods" really were, how they lived and worked together, what they made of their lives, and how they related to the mainstream of European science and culture. To bridge the gap between their mental world and ours, it is necessary to examine how these men and women of the sixteenth and seventeenth centuries saw the world, and how their world view changed. On this basis, we can move to a new understanding of Tycho Brahe's role in the Scientific Revolution and of his innovative achievement in organizing large-scale scientific research.

Tycho Brahe's idea of a large-scale, multifaceted scientific-research institution was inspired by the Neoplatonic tradition of the Renaissance, reinforced by the memory of the ancient Museum of Alexandria, and given focus through some of the places Tycho had visited in Denmark, Germany, Switzerland, and Italy. Once he had the idea for such an institution, financing it depended upon the fact that Tycho Brahe was born into the high nobility and had close connections to the Danish crown. Tycho recruited his staff by means of a European network of learned men and courtiers who felt connected by ties of Platonic friendship. Together, Tycho, his students, coworkers, and colleagues searched for the mathematical unities of the cosmos by means of huge new instruments, standardized procedures, innovative methods of observation and experimentation, and an epistemology that insisted upon quantifying and verifying the reliability of data. The result was a paradigm of research that gradually became a general European phenomenon.

The life and scientific achievement of Tycho Brahe were described at length in the late Victor E. Thoren's *The Lord of Uraniborg: A Biography of Tycho Brahe* (New York: Cambridge University Press, 1990), to which I contributed, but the focus of this book is quite different. Here, the staff, structure, and culture of Tycho's island move to the forefront, including the networks of patronage and clientage that converged on the island. What life and scientific work was like on Hven (also called Hveen or Ven) in the years 1576–97 is considered in some detail, followed by a look at how he conducted his search for a new patron in the years 1597–1601.

Scores of assistants, poets, scholars, scientists, and technicians scattered throughout Europe when they left Tycho Brahe's service, working in many

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fields and frequently patterning their lives on his. Some of them tried to establish new institutions on the model of Hven. In the seventeenth century, they infused the scientific culture of Tycho's island into the mainstream of European life. This is their story.

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## I

## IN KING FREDERICK'S SERVICE

—  
1575–1576

## THE RELUCTANT LORD

Toward the end of the year 1575, Tycho Brahe returned to Denmark from an extended trip abroad and immediately presented himself to King Frederick II at Sorø Abbey, where the court had arrived to celebrate the Yuletide.<sup>1</sup> Tycho Brahe was a consummate courtier, twenty-nine years of age, barrel-chested and noble of bearing, with pale eyes, reddish-blond hair and beard, immense moustaches, and a flesh-colored prosthesis on his nose. He wore the flowing cape, plumed bonnet, and sword of a nobleman. King Frederick was forty-two, regal, magnanimous, tall, and athletic, with a Van Dyke beard and close-cropped, curly hair.<sup>2</sup> He was known as a patron of learning and the fine arts, and he also loved rich banquets with mead and rhenish wine and hearty draughts of ale, as well as the witty, learned talk around a table like that of the Abbot of Sorø.

During his travels abroad, Tycho Brahe had acted as a royal agent to recruit artists and artisans for King Frederick, who was building a great new castle at Elsinore. Tycho had previously brought Venetian glassmakers to Denmark, as well as German papermakers, and he reported to the king on his recent contacts with painters, sculptors, hydraulic engineers, and other skilled artisans in Hesse-Kassel, Augsburg, Nuremberg, and Venice. He also described his visits to various courts and told about the coronation of the king of the Romans, which he had attended in Regensburg.

King Frederick beamed at the success of the mission and assumed that Tycho Brahe was now ready to serve the Danish crown in the tradition of his ancestors. Tycho had grown up in castles commanded by his father and foster father, and he was well aware that the opportunity to wield such authority was reserved to a privileged few. He was also aware of the burdens of command. The king offered him a choice of fiefs. Hammershus and

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Visborg Castles were on distant Baltic islands of considerable strategic importance; Helsingborg and Landskrona Castles warded over the Sound (Øresund), the gateway to the Baltic.<sup>3</sup> In all of these fiefs, the Lord Lieutenant held power over hundreds of peasants and villagers, while knights, soldiers, servants, petitioners, tenants, and couriers swarmed around him. King Frederick offered a choice of fiefs, but Tycho Brahe was noncommittal. He replied with the grace of a polished courtier, yet he demurred. He needed time to think it over. The king was puzzled, but he accepted Tycho's tactful demurrer.

Soon after, Tycho Brahe wrote more frankly to a friend, Johannes Praetensis, in Copenhagen: "I did not want to take possession of any of the castles our benevolent king so graciously offered me. I am displeased with society here, customary forms and the whole rubbish. . . . Among people of my own class . . . I waste much time." What Tycho really wanted, he wrote to his friend, was to live in a location favorable to a "student interested in learned subjects, or one who loves Apollonian tranquility and the Muses."<sup>4</sup> Beleaguered Baltic islands and great castles were not in that category. He longed to exchange his noble garb for the starry robe of a magus and natural philosopher, but he realized that he needed to do so in a way that would not arouse the ire of his liege lord, the king.

## A NOBLE UPBRINGING

Despite his unusual preferences, Tycho Brahe's career to the age of twenty-nine had generally been typical of his generation of Danish aristocrats. He was born at his family's ancestral seat of Knutstorp Castle [Fig. 1] on 14 December 1546, the son of Otte Brahe and his wife, Beate Bille, who could both blazon their eight quarterings of nobility. Like many in his class, Tycho was raised by foster parents; in his case, they were a childless aunt and paternal uncle, Inger Oxe and Jørgen Brahe, who effectively kidnapped him. Like other young Danish aristocrats, he learned Latin from tutors, entered the University of Copenhagen at an early age, and then traveled abroad with a preceptor to continue his studies in the famous Lutheran universities of Germany. Tycho's studies took him to Leipzig, Wittenberg, Rostock, Basel, and Augsburg during eight years abroad.<sup>5</sup> Like many aristocratic students, he once fought a duel: During the Christmas season of 1566, after a fair amount of drinking, Tycho Brahe and Manderup Parsberg, a fellow Danish nobleman, sparred with broadswords in the dark of a Rostock night. Tycho took a hard blow that gashed his forehead and hacked off the bridge of his nose. For the rest of his life, after the



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Fig. 1. Knutstorp Castle, built ca. 1551 by Otte Brahe. (Photograph by the author)

wounds were healed, he wore a nasal prosthesis, rubbing it frequently with ointment or adhesive from a small jar.<sup>6</sup>

In his early twenties, Tycho Brahe started to deviate from what his father considered to be the normal aristocratic pattern: He began to consider a scholarly career. His father was commander of great castles and a state councillor, but Otte Brahe was no scholar, and he saw no reason why his eldest son should be one. These scholarly interests came from his mother's side and from his foster mother: There had been many learned bishops, archbishops, royal secretaries, and ambassadors among the Billes, Ruds, and Oxes, whereas the Brahes had always been soldiers, lords lieutenant, and companions of kings.

Royal patronage encouraged young Tycho Brahe in his scholarly interests, despite his father's disapproval. The year after his duel, Tycho came

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home from Germany for the Christmas holidays of 1567, twenty-one years of age. After the holidays, he returned to the University of Rostock, where he received a promissory charter from Denmark in the spring of 1568, granting him the next vacant canonry of Roskilde Cathedral. Some influential person or persons at court had moved the king to issue this charter.<sup>7</sup> The broker of this patronage was probably Lord Steward Peter Oxe [Fig. 2], Tycho's foster uncle and a leading figure in the Danish administration, but Tycho's maternal uncle, Steen Bille, was probably also involved. During the holidays in 1567, Tycho must have discussed his scholarly interests with these sympathetic kinsmen, moving them in turn to act on his behalf. The promissory charter became the first link in a patron–client relationship between King Frederick II and young Tycho Brahe. Canonries in cathedral chapters of the Lutheran state church were the only type of learned space available to both nobles and commoners.<sup>8</sup> The appointments were for life, and there was a great deal of competition for them, so powerful patronage brokers were essential. Even Tycho Brahe, for all his influential relatives at court, would have to wait several years for the canonry promised to him in 1568.

Tycho Brahe's father died in the spring of 1571, and Tycho inherited considerable landed wealth, but it did not come to him immediately because it took several years to settle the estate. According to Danish law, a lifetime widow's jointure was set aside and the remainder of the estate was divided among all the sons and daughters. Each daughter received an equal share and each son received twice the daughter's share, with sons given preference with regard to manors.<sup>9</sup> Tycho Brahe was the eldest son, but Danish law and custom gave him no more than each of his brothers. In the matter of inheritance, as in so much else, his life was governed by the normal practices of the day.

#### LOVE AND MORGANATIC MARRIAGE

Tycho Brahe had returned home to Denmark in the year of his father's death. He had studied abroad for eight years, but now his student days were over. In the tradition of his family, he entered the service of the Danish court and soon established close personal ties with King Frederick II, twelve years his senior. Their relationship was based on shared aristocratic values within a courtly context that ran on the principle of reciprocity. Tycho Brahe brought family honor and personal service into the relationship, and the king granted honors while requiring deference and counsel. Tycho's ancestors had served the crown for many generations in the high-