Converging Elements in the Development of Late Seventeenth-Century Disciplinary Astronomy: Instrumentation, Education, Networks, and the Hevelius-Hooke Controversy

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In this dissertation, I examine astronomical practice in the second half of the seventeenth century by analyzing the nature of observation and instrumentation within an institutional and social context. I argue that astronomical practice was transformed by the convergence of several overlapping factors including the deployment of new instruments, the mathematical and astronomical education of practitioners, the gradual assimilation of new ideas, and the rise of scientific societies and networks. More specifically, I argue that the 1670’s controversy between Johannes Hevelius and Robert Hooke and the ensuing debate that involved a larger circle of practitioners, helped establish a new foundation for the discipline of astronomy. In forcing practitioners to take sides, the controversy prompted them to define the precise nature of astronomical practice as well as the necessary qualifications for its practitioners.

In Chapter 1, I discuss sixteenth and seventeenth-century astronomical instruments, and I provide a history of instrumentation from the use of positional measuring instruments in the late sixteenth century to the more widespread use of micrometers and telescopically-mounted positional measuring instruments in the late seventeenth century. Proceeding from the instruments to the people involved, in Chapters 2 and 3 I discuss the mathematical and astronomical community of the late sixteenth to late seventeenth centuries. The “community” included those individuals working both within and outside the universities. In Chapter 4, I discuss the Hevelius-Hooke controversy over the relative merits of naked-eye versus telescopic sights as the watershed in positional astronomy that defined the role of astronomers, shaped their methods of observation, and directed future research. In the final chapter of this study, Chapter 5, I discuss the work of Cassini at the Paris Observatory and Flamsteed at the Greenwich Observatory, and how their efforts were shaped by the Hevelius-Hooke controversy.
Acknowledgements

I remember the exact moment when the seeds of this dissertation were first planted. I was sitting in a restaurant with my advisor, Moti Feingold, who asked me if I would be interested in writing a Masters thesis on the controversy between Robert Hooke and Johannes Hevelius. Needless to say, I barely knew who Hooke was at the time and I had never heard of Hevelius, but I was willing to look into the topic. This dissertation is a product of the work done since then.

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## Abbreviated References

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<tr>
<td>PS</td>
<td>Bibliothèque de l’Observatoire de Paris, Manuscripts.</td>
</tr>
<tr>
<td>PT</td>
<td>Philosophical Transactions (followed by volume number).</td>
</tr>
<tr>
<td>RGO</td>
<td>Cambridge University Library, Archives of the Royal Greenwich Observatory, Flamsteed’s Papers.</td>
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