The Beetle and the Bard: Aspects of 17th Century Printing Practice as Illustrated by the Works of Thomas Moffet and William Shakespeare

INTRODUCTION

Although insects are mentioned throughout the various works of William Shakespeare, his *Mr. William Shakespeare's Comedies, Histories & Tragedies*, better known as the First Folio, published in 1623, could hardly be called an entomological work. Likewise, Thomas Moffet's 1634 *Insectorum sive minimorum animalium theatrum* does not rank in the pantheon of great literature. However, when examining them with an eye towards their print histories, commonalities quickly begin to appear.

Moffet's *Insectorum* is quite literally overflowing with woodcut illustrations (figure 1)[1]. Indeed, on some pages, the images of insects seem to jostle with the text, pushing it to the edges of the page so they can take center stage. However, nestled throughout the book are other pictorial

Figure 1

objects: printers' ornaments that straddle the line between text and illustration. Cut from wood to be printed in the same manner as the multitudinous insects, these ornaments generally act as embellishments to new chapters, or tastefully fill empty space on the page. But unlike the insects, which were all cut specifically for Moffet's work, many of these ornaments had lived long lives in the press before gracing the pages of the *Insectorum*. In fact, several are better known for being associated with a different kind of theatre—they decorated the pages of the First Folio.

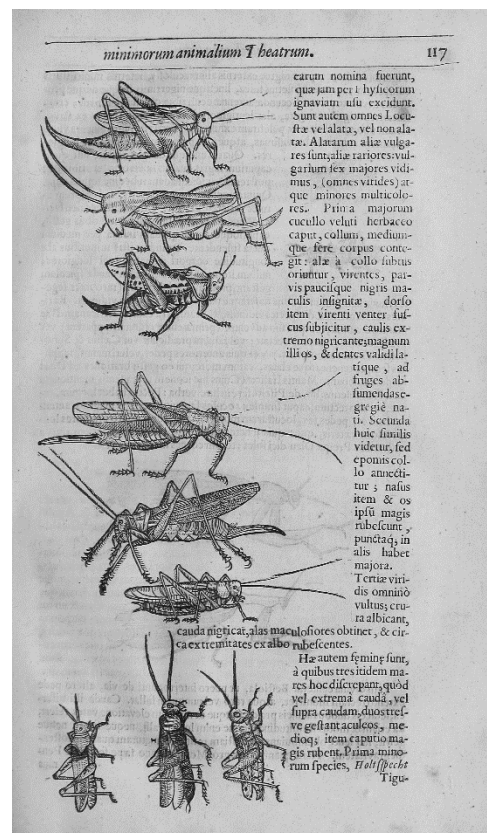I have identified four ornaments in the *Insectorum* that were also used in the First Folio: two

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[1] Unless otherwise noted, the images in the figures were taken by the author from works in Smithsonian Libraries.

headpieces, and two triangular tailpieces (figure 2).[2] The larger of the two tailpieces in particular has a characteristic design – a mythical beast peers out at the reader from behind dark swathes of classical decoration, seemingly restrained by the central element of the device. For this reason, it is referred to as the satyr tailpiece in Shakespearian scholarship.[3] Far from being appreciated simply for its aesthetic
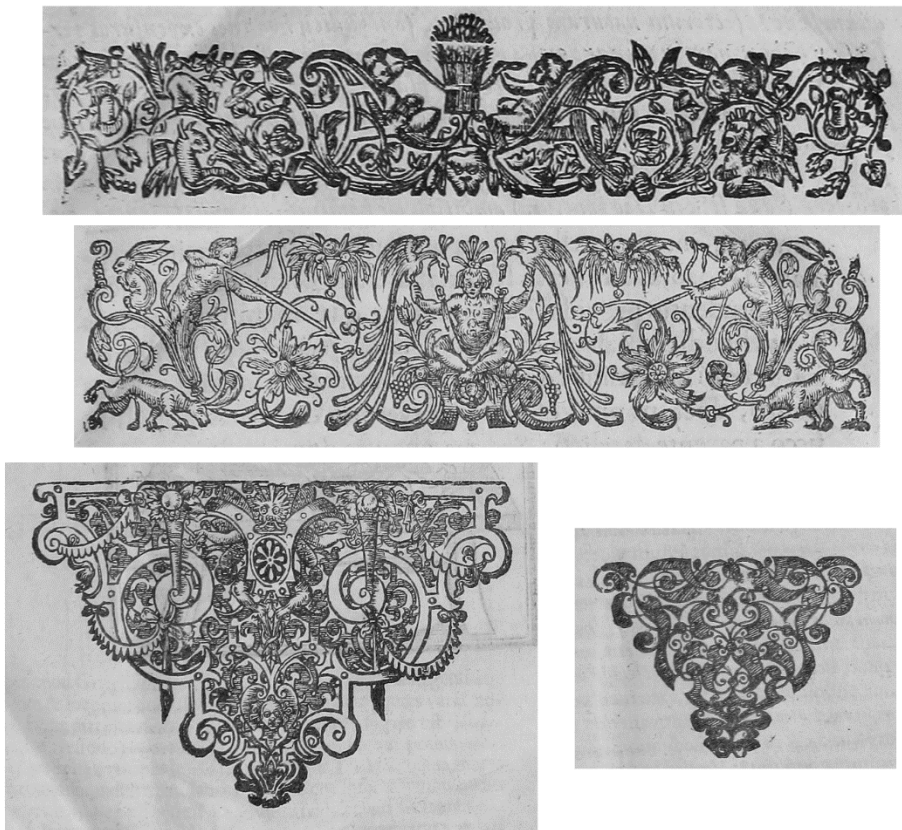

Figure 2

merit, the tailpiece has played a significant role in interpreting the printing practices of father and son William and Isaac Jaggard, the famed printers of the First Folio. One of the headpieces, featuring a distinctive shock of wheat, is also important in terms of the overlapping history of the two works, although this paper is the first time it has been discussed in print. But there is an apparent twist in this story: the *Insectorum* was printed not by the Jaggards, but by Thomas Cotes.

How did the ornaments end up being used by a different printer eleven years later, and what can their appearance in these disparate works tell us about seventeenth century printing practice? The

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[2] This was done digitally: by switching back and forth between two images on the same scale and of the same orientation of the same ornament, it is possible to see minute changes in design or evidence of degeneration. It is the same method used by the analog Hinman Collator.

[3] Charleton Hinman, *The Printing and Proof-Reading of the First Folio of Shakespeare*. (Oxford: The Clarendon Press, 1963), 21.

First Folio is the most heavily studied early modern English book in the whole of Western canon,[4] which

means utilizing the copious literature about it allows us to establish certain facts about the ornaments in

question with relative certainty.[5] Taking the established significance of the satyr tailpiece and applying a

similar methodology of investigation to the wheat shock headpiece opens up avenues for understanding

the overlap of these two printers specifically, and also underlines the value of understanding both book

history and printing practice more broadly when conducting textual scholarship. In order to best

contextualize the significance of the recurrence of these ornaments, the following article briefly

recounts the complex publishing histories of three works in which they appear: Moffet's *Insectorum* and

Shakespeare's First and Second Folios. This historical synopsis is followed by an identification and

chronology of the multiple states of the wheat shock headpiece, which promises to feed into current

studies of similar typographic tracking using emerging technologies.

INTERSECTING HISTORIES

The production and subsequent printing of the *Insectorum* is complex and sometimes confusing;

although Moffet's name is the one most closely associated with the work, it would be more accurate to

give equal credit to esteemed naturalist Conrad Gessner and Moffet's friend and colleague Thomas

Penny.[6] Penny and Gessner corresponded throughout the 1560s, and when the latter died in 1565, he

gave his notes for an unpublished work on insects to Penny.[7] However, Penny in turn died in 1588,

leaving the still-unfinished manuscript to Moffet, along with further entomological notes compiled by

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[4] B. D. R. Higgins, "Printing the First Folio," in *The Cambridge Companion to Shakespeare's First Folio,* ed. Emma Smith (Cambridge: Cambridge University Press: 2016) 30.

[5] Although the sheer volume of works that study the First Folio are extremely useful to other fields looking at seventeenth century printing history, in many ways they can eclipse related topics. There are few sources that write about the printers of Shakespeare as anything other than printers of Shakespeare; but if it weren't for their roles in the printing of the works of Shakespeare, much less would be known about them. As Richard III said in Shakespeare's play that bears his name, "Fame lives long" (Act 3, Scene 1).

[6] Janice Neri, *The Insect and the Image: Visualizing Nature in Early Modern Europe, 1500-1700* (Minneapolis: The University of Minnesota Press, 2011), 45.

[7] Neri 2011, 46.

the physician-naturalist Edward Wotton.[8] Moffet subsequently combined the manuscript and the notes, making heavy edits in the process. A physician by trade, he approached the project more as a medical treatise than a work of natural history;[9] modern assessments of his prose run the gamut from charming and "wholly unlike the dry scientific precision" of other comparable works,[10] to obscuring and even destroying the research of Penny in particular.[11] But however it is viewed through a modern lens, the great naturalist Carl Linnaeus (1707-1778) regarded the book as a valuable scientific resource: he used many of the terms from the *Insectorum* in order to name genera in his *Systema naturae[12]*—the work that established the binomial naming system still used by modern taxonomists.

The *Insectorum* was finally published in 1634, a full 46 years after the manuscript came to Moffet—why is there such a large gap? And where was the work in the interim? Although Moffet took out a license in 1590 to have the work printed at The Hague, it was never executed, for reasons that remain unclear;[13] the fact that there was a lack of demand in England for natural history books at the time likely contributed.[14] And so, upon Moffet's death in 1604, the manuscript was passed on yet again, this time to Moffet's apothecary, known only as Mr. Darnell.

That same year, Shakespeare's King's Men performed at the court of King James for the first time.[15] Among the players in the company were John Heminges and Henry Condell who, when Shakespeare died in 1616, tasked themselves with bringing into the world the most perfect edition of

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[8] Hugh Trevor-Roper, *Europe's Physician: The Various Life of Sir Theodore de Mayerne* (New Haven: Yale University Press, 2006), 211.

[9] Neri 2011, 61.

[10] Charles E. Raven, *English Naturalists from Neckam to Ray: A Study of the Making of the Modern World* (Cambridge: Cambridge University Press, 1947), 189.

[11] Philip H. Swann, "Thomas Mouffet's Theatrum Insectorum, 1634," *Bulletin of the British Arachnological Society*, no. 2 (1973): 169.

[12] M. Beier, "The Early Naturalists and Anatomists During the Renaissance and Seventeenth Century," in *History of Entomology* ed. Ray F. Smith, Thomas E. Mittler, and Carroll N. Smith (Palo Alto: Annual Reviews Inc., 1973), 86.

[13] Raven 1947, 180.

[14] Charles Coulston Gillispie, ed. *Dictionary of Scientific Biography* (New York: Scribner, 1974), 440.

[15] R. A. Foakes, "Playhouses and Players," in *The Cambridge Companion to English Renaissance Drama*, ed. A. R. Braunmuller and Michael Hattaway (Cambridge: Cambridge University Press, 1990), 33.

Shakepeare's plays,[16] free from the "maimed and deformed" prose of unauthorized copies.[17] The printing house they chose for this auspicious task was that of William and Isaac Jaggard, a large establishment that held a monopoly of London's playbill printing;[18] ironically, in 1619, their printing house produced the "false folio"— one of the very unauthorized works Heminges and Condell railed against.[19]

By that time, the *Insectorum* was on the move again. In 1617, Theodore de Mayerne, physician to the kings of both England and France, acquired Moffet's papers, including the *Insectorum* manuscript, from Mr. Darnell.[20] While Mayerne used Moffet's medical notes to improve his own practice,[21] in his own words, "[the *Insectorum* manuscript] lay for some years in [his] Study cast aside in the dust among Worms and Moths".[22] During that time, Mayerne claims he shopped the manuscript around to various printers, none of whom seemed to want to undertake the mammoth (and expensive) task of printing such a heavily illustrated work. "Printers who were so greedy of Money," he lamented, "were not pleased with the benefit of a noble Art, unless it would pay more than the fraight."[23]

Meanwhile, the Jaggards's firm began printing the First Folio in 1621 and, after a few notable interruptions,[24] completed it in 1623,[25] although William Jaggard died shortly before the book went on

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[16] Heminges and Condell did not mince words about what they thought of the "diverse stolne, and surreptitious copies," and called their own work "cur'd, and perfect of [its] limbes." However, whether or not the First Folio truly is more perfect than its predecessors can be debated. Never let it be said that actors have no marketing skills.

[17] William Shakespeare, *Mr. William Shakespeare's Comedies, Histories & Tragedies* (London: Isaac Iaggard and Edward Blount, 1623), [3].

[18] Higgins in Smith 2016, 31.

[19] Alfred. W. Pollard, *Shakespeare Folios and Quartos: A Study in the Bibliography of Shakespeare's Plays 1594–1685* (London: Methuen and Company, 1909), 111.

[20] Trevor-Roper 2006, 215.

[21] Ibid.

[22] Laura M. Payne, "Sir Theodore Turquet De Mayerne 1573-1655," *The British Medical Journal*, vol. 1, no. 4916 (1955): 783.

[23] Ibid.

[24] For more on the fraught history of the printing of the First Folio, see Charlton Hinman's 1963 *The Printing and Proof-Reading of the First Folio of Shakespeare* and Edwin Eliott Willoughby's 1932 *The Printing of the First Folio of Shakespeare*.

[25] Charlton Hinman, *The Printing and Proof-Reading of the First Folio of Shakespeare* (Oxford: The Clarendon Press, 1963), 334.

sale. Contrary to modern assumption, though, the Folio did not fly off the shelves. One of the reasons

why is in the nickname of the book: Philip Gaskell's description of the folio format requiring more paper

and usage of type than other, generally smaller, formats[26] has long been the accepted reason for the

relative expense of books printed in folio. A bound First Folio would have cost the equivalent of nearly

two months' wages for the average laborer in 1623.[27] However, more recent scholarship, such as the

2010 *Tudor Books and Readers*, suggests that a book in folio format was— depending on how effectively

the page layout made use of the space available— not necessarily more expensive to produce than one

in quarto;[28] calling into question long-held convention, Stephen Galbraith observes that the Jaggards

saved a great deal of money and material by printing Shakespeare's works in folio, although he does not

directly address the fact that they in turn *charged* a great deal for the work regardless.[29]

No matter what the reason, the First Folio was quite an expensive work, and the 750 copies[30] of

it initially printed by the Jaggards took until 1632 to sell out.[31] But before the Folio could run into a

second edition, Isaac Jaggard died in 1627; in accordance with his will, the ownership of his printing

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[26] Philip Gaskell's 1972 *A New Introduction to Bibliography*, or any of its subsequent editions, gives a much more detailed description of the issue of page format.

[27] Jean-Christophe Mayer, "Early Buyers and Readers," in *The Cambridge Companion to Shakespeare's First Folio*, ed. Emma Smith (Cambridge: Cambridge University Press, 2016), 105.

[28] Joseph A. Dane and Alexandra Gillespie, "The Myth of the Cheap Quarto," in *Tudor Books and Readers*, ed. John N. King (Cambridge: Cambridge University Press, 2010), 25.

[29] Through comparing the amount of paper used in the publication of the eighteen Shakespeare plays printed in quarto to how much paper was ultimately used to print the First Folio (and the differences in page layout), Galbraith notes that the folio format saved the Jaggards a total of 175.05 sheets of paper. It could be argued, though, that the epithet "folio of economy" is not the full story; in his chapter, Galbraith mentions that "having all of Shakespeare's plays in one volume was a selling point" for "those who could afford" to have them so consolidated. "English literary folios 1593–1623: studying shifts in format," in *Tudor Books and Readers*, ed. John N. King (Cambridge: Cambridge University Press, 2010), 64-66.

[30] "Publishing Shakespeare," Folger Shakespeare Library, accessed 26th August 2017. http://www.folger.edu/publishing-shakespeare.

[31] Luther Samuel Livingston, *The Four Folios of Shakespeare's Plays* (New York: Dodd, Mead & Company, 1907), 22.

house and his stake in "the Shackspheere playes"[32] passed to William's former apprentice Thomas

Cotes.[33]

The First Folio may have been a slow mover in sales, but this should not imply that there was no

demand for it. Given the amount of time and expense required to edit, set, and print the Second Folio, it

is likely that Cotes began the process before the final copy of the First left the shelf. This was not a

decision that Cotes would have made lightly; the amount of type that would have to be in use to print

the Second Folio would have been costly for the shop, and this would have been quite a gamble if there

were not customers waiting to buy it. Indeed, he must have had a fair amount of confidence in his

thriftiness, as it was around this time that Mayerne approached him with the *Insectorum* manuscript.[34]

Historian George Thomson theorizes that, although the Second Folio came out in 1632 and the

Insectorum in 1634, both works were on Cotes's press at the same time.[35] This claim is supported by

evidence in the ornaments, which will be discussed in more detail below. But Cotes, and the Jaggards

before him, were not particularly well-known for printing heavily illustrated works – although William

Jaggard was involved in the printing and publishing of a number of "large, typographically complicated

books," the vast majority of the titles they printed were religious in nature, with broadly defined

"historical works" in a distant second place.[36] Illustrated works, as Mayerne discovered in his earlier

efforts to find printers, were costly things, and did not necessarily have a great return on investment.

This is due in part to the necessity of commissioning numerous original woodblocks that would likely

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[32] Ibid.

[33] Edwin Eliott Willoughby, *A Printer of Shakespeare: The Books and Times of William Jaggard* (London: Philip Allan & Co., 1934), 180.

[34] George Thomson, *Insectorum Sive Minimorum Animalium: The Butterflies and Moths* (Lochmaben: Privately produced by George Thomson, 2000), 14.

[35] Thomson, 2000, 14.

[36] Adam G. Hooks, *Selling Shakespeare: Biography, Bibliography, and the Book Trade* (Cambridge: Cambridge University Press, 2016), 125.

never be used again (unless the book ran into a further edition). But Mayerne came into the working

partnership with Cotes prepared.

EVIDENCE IN THE WOODCUTS

Current literature does not indicate when or by whom the woodcut illustrations for the

Insectorum were carved, although Thomson supposes they were "probably cut over a long period during

the latter part of the sixteenth and the first thirty years of the seventeenth centuries";[37] this supposition

is probably based on Moffet's preface to the *Insectorum* which states that Penny "had spent… much

money for the plates engraving."[38] The *Insectorum* manuscript, which now resides in the British Library

as Sloane 4014, includes test printings of at least 39 of the hundreds of woodcuts that appear in the
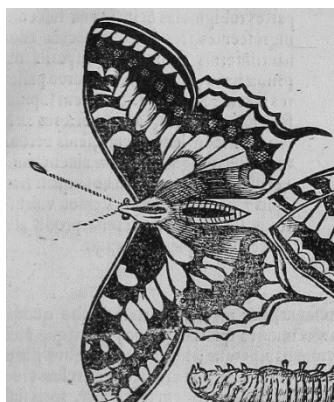

finished work.[39] Philip H. Swann identifies this manuscript, with its clear script

and arrangement of original illustrations pasted around the text,[40] as Moffet's

fair copy as he prepared it for the printer.[41] The inclusion of these test prints

alongside Penny's originals demonstrate that the manuscript came to Cotes

in an advanced state – this certainly took some of the pressure off of the

printer's wallet. However, perhaps due to the delay between their cutting

Figure 3

and their eventual use on the printing press, some of the more delicate pieces of

insect anatomy were damaged on the blocks (for example, the lower antenna of the butterfly in figure

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[37] 2000, 16.

[38] Swann, 1973, 170.

[39] This is based on a count made by referencing the Microfilm reproduction of the manuscript; there are a few images that present an unclear picture of the nature of the illustration, and those have not been counted. For the most part, these text prints do not appear to be woodcuts of any extant original art within the manuscript, although in its latter pages there are at least two instances of the original art and its test proof on the same page.

[40] Apparently cut directly out of Penny's notes and correspondence (1973, 170).

[41] 1973, 169.

3). This damage is evident even in the earliest printings of the *Insectorum*,[42] which suggests that it was not due to mishandling during the printing process.

Although Cotes got a slight head start on the *Insectorum* thanks to the partially completed woodcuts, the fact is that his shop simply wasn't used to dealing with such heavily illustrated works; Adam G. Hooks observes that the Jaggards – William in particular – "possessed an acute awareness of the intellectual… value of the books he produced,"[43] and further notes William's "abiding interest" in natural history based on the output of the shop,[44] but it is unclear whether or not Cotes shared this interest. Apprenticed to the Jaggards in 1597,[45] he would have been present for the printing of illustrated works such as Edward Topsell's *History of Four-footed Beasts* (1607) and *History of Serpents* (1608), as well as the first edition of Helkiah Crooke's *Mikrokosmographia* (1616), but the small size and inter-textual positions of the woodcuts of the
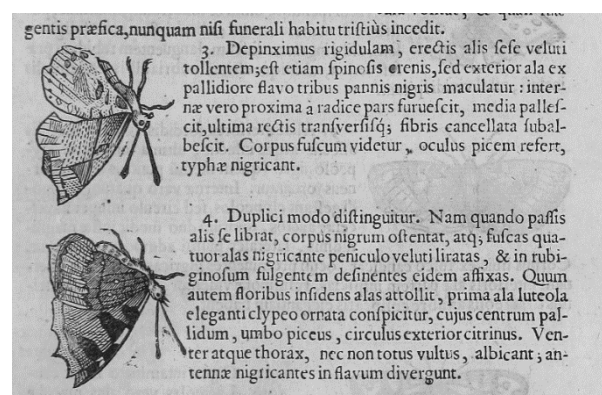

Figure 4

Insectorum would have made the work particularly difficult to manage typographically. The shop's struggle under Cotes to set the type and the woodcuts in an efficient way caused the descriptive text to lag behind the corresponding images at some points,[46] and some blocks are even set upside down (figure 4). These difficulties likely contributed to the *Insectorum* being finished two years after the Second Folio.

Tracing this intersection of the printing history of the First and Second Folios and the *Insectorum* means that the appearance of the ornaments across time and genre makes more sense: the re-use of

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[42] Thomson, 2000, 16.
[43] 2016, 124.
[44] 2016, 125.
[45] Edward Arber, A Transcript of the Registers of the Company of Stationers of London, 1554-1640 A.D. (London: Privately printed, 1875-1894), 94b.
[46] Thomson, 2000, 7.

typographical ornament was a cost-saving measure in printing before, during, and after the seventeenth century.[47] Rather than commissioning thematically-appropriate ornaments to be designed and cut for each new work that came through the press, printers kept a stock of ornaments that could be used in various contexts. When a printer died or went out of business, these valuable stocks were usually sold off or passed down to the next family member who would take over the operation of the presses.[48] The Jaggards themselves had purchased their presses and type from one James Roberts, who had in turn inherited them from John Charlwood.[49] When Cotes took over the Jaggards' stock in 1627,[50] he simply continued to use the supplies that were available to him.

  Being aware of this practice raises some interesting questions about the way the ornaments appear across the First and Second Folios, the *Insectorum,* and beyond. Curiously, despite having access to the same ornament stock as the Jaggards, Cotes's compositors made little effort in general in the Second Folio to duplicate the distribution of ornaments in the First. In fact, the satyr tailpiece only appears twice in the Second Folio,[51] whereas it was
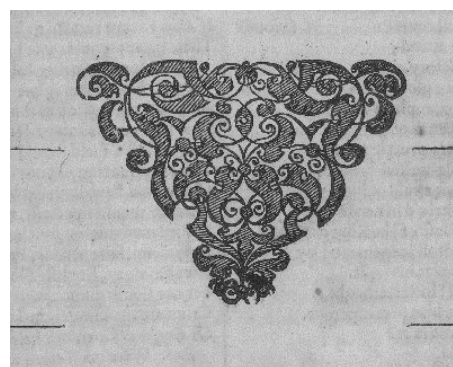

Figure 5

used twenty-five times in the First.[52] Sometimes, due to changes in the spacing of the text from the First to the Second, there was simply not enough room for the tailpiece; but in most instances, the compositors seemed to favor a smaller, less complex tailpiece (figure 5)[53] even when the amount of space on the page was appropriate for the large satyr. The smaller tailpiece is used in the *Insectorum* in

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[47] Ronald B. McKerrow, *An Introduction to Bibliography for Literary Students* (Oxford: Clarendon Press, 1977) 113.

[48] McKerrow 1977, 118.

[49] H. R. Plomer, "The Printers of Shakespeare's Plays and Poems," *The Library* s2-VII, 26 (1906): 160-161.

[50] Willoughby 1934, 180.

[51] At the end of *Henry VI (Part I)* and *Tymon of Athens.*

[52] Higgins in Smith 2016, 42.

[53] William Shakespeare. *Mr. William Shakespeare's Comedies, Histories & Tragedies* (London, 1623), p. 100. Call # STC 22274 Fo.2 no.07. Used by permission of the Folger Shakespeare Library.

only one instance although, as with the Second Folio, there are many large spaces where the satyr

tailpiece would fit comfortably. The topic of ornament selection and placement across editions is one

that would benefit from further research, there is currently little indication of why Cotes's compositors

made the aesthetic decisions they did regarding the use of the two tailpieces.

One contributing factor may have been the overall physical condition of the ornaments. It is

evident why the larger satyr tailpiece was eventually abandoned by the print shop altogether: woodcut

illustrations and ornaments, while convenient for type setting,[54] are not as durable as metal type. It is

unclear when exactly the tailpieces and headpieces in question were cut, but it is apparent from their

wear alone that by the time they appeared in the *Insectorum* and the Second Folio they had been in use

for a long time. Even before the ornaments were transferred to Cotes, the satyr tailpiece had suffered

some distinctive damage to the top edge; using its particular patterns of wear and breaking over the

course of the printing of the First Folio, attentive historians have been able to date the order in which

the plays in the Folio were printed.[55] The tailpiece shows this damage and more in both the *Insectorum*

and the Second Folio, which reinforces Thomson's claim that Cotes was printing both works

simultaneously.[56]

According to my review of various works[57] printed by the Jaggards and by Cotes, it appears that

the earliest use of the satyr tailpiece is in the 1623 First Folio, while its swan song is in John Parkinson's

Theatrum botanicum, printed by Cotes in 1640. The review also demonstrated that the tailpiece actually

lived a relatively short time in the press compared to one of the headpieces shared by the *Insectorum*

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[54] They can be set in the same forme as the main body of type, since both the woodcuts and type are printed using a relief process. Other methods such as etchings and engravings, which use an intaglio process, must be printed separately.

[55] Edwin Eliott Willoughby's 1929 Doctoral thesis "Typographical Problems in the First Folio of Shakespeare" was the first work to use the tailpiece as a dating tool, and his methods were later expanded upon by Charlton Hinman (of collator fame) and H. R. Plomer.

[56] Thomson, 2000, 14.

[57] This review focused largely on books in folio format, given that the two headpieces and the satyr tailpiece would not fit on the page in any other format. Works were selected that covered the spread of the Jaggards' and Cotes's printing history. See appendix for list of works consulted.

and the First Folio: this headpiece, featuring a central motif of cherubs tying up a shock of wheat, makes

its first appearance in Marcus Juniatus Justinus's *The Historie of Justine*, printed by the Jaggards in 1606,

and its last appearance in the John Guillim's *Display of Heraldrie,* printed by Cotes in 1638. Its damage is

even more evident than that of the tailpiece – in fact, between its appearance in Justinus's *Historie*, the

First Folio, the *Insectorum*, and the *Heraldrie*, it appears in several states. The first "state," as seen in

Figure 6

Justinus, features either a relatively short wheat shock or a shock without a head, but with distinctive

pieces poking up on the right and particularly the left of the shock (figure 6).[58] When the ornament

Figure 7

makes its next appearance in Topsell's *History*, the shock has acquired a taller head, but with a clear gap

between it and the shock, and lacking the poking up pieces on either side (figure 7).[59] This slight change

suggests that either the shock was smoothed out to more easily attach the new head, or that this is a

new ornament altogether; further examination of small details within the ornament may lend credence

to one possibility over the other, but the uncertainty leads me to designate the "state" in Justinus as

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[58] Marcus Junianus Justinus. *The historie of Iustine: Containing a narration of kingdomes, from the beginning of the Assyrian monarchy, vnto the raigne of Emperour Augustus* (London, 1606), p. 21. Call #STC 24293 c. 1. Used by permission of the Folger Shakespeare Library.

[59] Edward Topsell. *The historie of foure-footed beastes: Describing the true and liuely figure of euery beast, with a discourse of their seuerall names*… (London, 1607), p. 1. Call #STC 24123 c.2. Used by permission of the Folger Shakespeare Library.

state zero, starting the count instead from Topsell. The gap seen in the first state of the ornament

evidently caused a break by the next time it was used, in 1623 in the First Folio, resulting in a second,
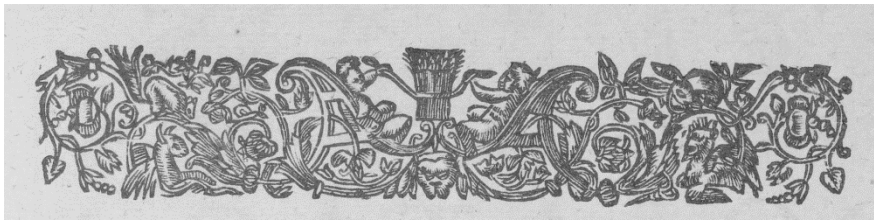

Figure 8

headless state (figure 8).[60] By its appearance in the second edition of Crooke's *Mikrokosmographia* in

1631, it had acquired a replacement head which resulted in a smaller gap between the shock and the

Figure 9

head (figure 9).[61] This third state is the one that is present in both the Second Folio and the *Insectorum*

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[60] William Shakespeare. *Mr. William Shakespeare's Comedies, Histories & Tragedies* (London, 1623), A5 recto. Call #STC 22273 Fo.1 no.19. Used by permission of the Folger Shakespeare Library.

[61] Helkiah Crooke. *Mikrokosmographia: A description of the body of man.Together vvith the controversies and figures thereto belonging* (London, 1631), contents page. Call #STC 6063. Used by permission of the Folger Shakespeare Library.

Figure 10

Figure 11

(figures 10[62] and 11 respectively). In its last appearance, in Guillim's 1638 *Heraldrie*, it exhibits both the

second and third states, as well as a distinctive crack on the right side of the ornament that makes it

Figure 12

clear that, despite the different states, it is the same piece (figure 12).[63] The mixed states present in

Heraldrie open up the possibility that this headpiece, much like the satyr tailpiece in the First Folio,

could be used to discover the sequence in which the pages of the book were printed.

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[62] William Shakespeare. *Mr. William Shakespeare's Comedies, Histories & Tragedies* (London, 1632), p. 2*. Call # STC 22274 Fo.2 no.07. Used by permission of the Folger Shakespeare Library.
[63] John Guillim. *A display of heraldrie: manifesting a more easie accesse to the knowledge thereof than hath beene hitherto published by any, through the benefit of method* (London, 1638) p. 271 and 363 respectively. Call #STC 12503. Used by permission of the Folger Shakespeare Library.

This article is, according to my research, the first time the wheat shock ornament and its states have been described in print. This analysis of it lends strong credence to Thomson's theory that the Second Folio and the *Insectorum* were on the press at the same time: the ornament appears in its resurrected second state in both works. In his 1999 article "The Treatment of Typesetting and Presswork in Bibliographical Description," G. Thomas Tansell warns against hastily identifying a print shop based only on its typographic ornaments, citing "the ease with which these items could be shared" or duplicated as a particular danger.[64] While Tansell's advice rings true in most instances, it is clear that misattributing the ornaments is not an issue in this case, taking into account the print lineage shared by the Jaggards and Cotes, as well as meticulously evaluating changes in the ornaments over their use in different works.

Documenting the sequence of states of the wheat shock headpiece and demonstrating its continued use lays the groundwork for further study of the output of both the Jaggards and Cotes. In his recent blog post "Tracking Moveable Type with Arch-V Image Recognition Software," Carl Stahmer describes how his team at the University of California Davis used Arch-V to "track the re-use of individual sorts of type across multiple pages in multiple works," specifically within UC Davis' English Broadside Ballad Archive.[65] Using a software like Arch-V to trace further appearances of Jaggard-Cotes ornaments across other works printed by them has the potential to further illuminate the workings of their shop floors, and casting the net more broadly across unattributed works may bring to light other previously unknown publications and establish "patterns of association."[66] For example: throughout the seventeenth century, tailpieces that are shockingly similar to the satyr crop up in works printed all over

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[64] G. Thomas Tanselle, "The Treatment of Typesetting and Presswork in Bibliographical Description," *Studies in Bibliography* 52 (1999): 13.
[65] Carl Stahmer, "Tracking Moveable Type with Arch-V Image Recognition Software," last modified December 6, 2018, http://www.carlstahmer.com/2018/12/tracking-moveable-type-with-arch-v-image-recognition-software/
[66] Stahmer 2018.

Western Europe, and establishing such patterns of association may tell us more about where the design

originated and why it became so popular.

Unfortunately, and somewhat ironically given the damaged sort on which Stahmer initially tests

Arch-V, software like this has the potential to fall down when taking into account one of the central

themes discussed in this article: damage accrued over time. Stahmer does not discuss what, if any,

provisions his team has made to correct for such variations, or if the program has sufficient elasticity to

recognize if a variation in an ornament is due to damage or the fact that it may simply be a slightly

different ornament (as in the satyr-esque tailpieces discussed above). Even when exploring texts with

machine learning, Tanselle's warnings ring true.

Tanselle's further cautioning against putting too much bibliographic weight on ornament use is

important to keep in mind as well, but the opposite extreme has its own dangers. If emphasis of the

historical record obscures ornament use, there is potential to overlook important physical evidence of

printing practice. The historical intersection of the publication of the *Insectorum* and the two

Shakespeare Folios had a clear influence on their typographical ornaments: the varied states in which

the ornaments appear reflects this and provides a visual chronology of the output of their printers.

Further research will hopefully uncover more details of how this particular overlap possibly affected the

printers' aesthetic choices in their page layouts. The type of interdisciplinary approach used in this

article—exploring material evidence with and the historical record simultaneously— is widely applicable

to many bibliographic topics. Recognizing and taking into account all of the facets of early modern

printed books promises to deepen our understanding of both the time in which they were made and

their importance as artefacts.

APPENDIX

List of Works Consulted in Chronological Order

Mascall, Leonard. *A booke of the arte and maner how to plant and graffe all sortes of trees: how to set stones, and sowe pepins, to make wylde trees to graffe on, as also remedies and medicines*. London: Henry Denham and John Charlewood, 1575.

Bruno, Giordano. *Giordano Bruno Nolano. De gl'heroici furori. Al molto illustre et eccellente caualliero, Signor Phillippo Sidneo*. Parigi [i.e. London]: Antonio Baio [i.e. J. Charlwood], 1585.

Justinus, Marcus Junianus. *The historie of Iustine: Containing a narration of kingdomes, from the beginning of the Assyrian monarchy, vnto the raigne of Emperour Augustus*. London: William Iaggard, 1606.

Topsell, Edward. *The historie of foure-footed beastes: Describing the true and liuely figure of euery beast, with a discourse of their seuerall names…* London: William Iaggard, 1607.

Heywood, Thomas. *Troia Britanica, or, Great Britaines Troy: A Poem..*. London: W. Jaggard, 1609.

Crooke, Helkiah. *Mikrokosmographia: A description of the body of man.Together vvith the controversies and figures thereto belonging*. London: W. Iaggard, 1616.

Shakespeare, William. *Mr. William Shakespeare's Comedies, Histories & Tragedies.* London: Isaac Iaggard and Edward Blount, 1623.

Crooke, Helkiah. *Mikrokosmographia: A description of the body of man.Together vvith the controversies and figures thereto belonging.* London: Thomas and Richard Cotes, 1631.

Shakespeare, William. *Mr. William Shakespeare's Comedies, Histories & Tragedies.* London: Thomas Cotes, 1632.

Moffet, Thomas. *Insectorum Sive Minimorum Animalium Theatrum.* London: Tomas Cotes, 1634.

Person, David. *Varieties: or, A surueigh of rare and excellent matters: necessary and delectable for all sorts of persons*. London: Richard Badger [and Thomas Cotes], 1635.

Ramus, Petrus. *Via regia ad geometriam. The vvay to geometry: Being necessary and usefull, for astronomers*. London: Thomas Cotes, 1636.

Guillim, John. *A display of heraldrie: manifesting a more easie accesse to the knowledge thereof than hath beene hitherto published by any, through the benefit of method*. London: Thomas Cotes for Iacob Blome, 1638.

Parkinson, John. *Theatrum botanicum: The theater of plants. Or, An herball of a large extent*. London: Thomas Cotes, 1640.

Popes conclave. *The Passionate remonstrance made by His Holinesse in the conclave at Rome: upon the late proceedings and great covenant of Scotland, &c*. Edingborough [i.e. London]: T. and R. Cotes, 1641.

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