UNIVERSITY OF CALGARY

THE MUSIC TREATISES OF THOMAS SALMON (1648-1706)

by

Robert Edwin Lawrence

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled, "The Music Treatises of Thomas Salmon (1648-1706)" submitted by Robert Edwin Lawrence in partial fulfillment of the requirements for the degree of Master of Arts.

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ABSTRACT

Thomas Salmon (1648-1706) published two music treatises. In the first, entitled *An Essay to the Advancement of Musick* (London, 1672), Salmon attempted to reform musical notation by: (1) replacing the complicated Gamut with seven letters which repeat themselves at the octave, (2) placing these seven notes constantly upon the same lines and spaces, thereby rendering the old clefs obsolete, and (3) abolishing tablature notation. His proposals were not warmly received in all circles and led to a pamphlet war between Salmon and the noted composer Matthew Locke. Although Salmon's notational system was ultimately rejected, it is not without a larger significance in musical and philosophical terms. From a musical perspective, his proposal represents an attack upon the procedures and nomenclature of modal theory, suggesting that Salmon considered the theoretical concepts and pedagogical methods associated with modality no longer relevant. Other influences on Salmon's approach to music include the tenets of Pansophism, the philosophies of Francis Bacon, and the works of his music master John Birchensha.

Salmon's second treatise, *A Proposal to Perform Musick in Perfect and Mathematical Proportions* (London, 1688), calls for the use of just intonation in musical performance. Salmon provided instructions for the construction of a viol fretboard in which just intonation was incorporated. Although Salmon was fully aware of the limitations just intonation placed upon musicians, he believed that through the use of pure intervals the power of music, described by the ancients, could be recaptured.

In this thesis, Salmon and his works have been examined from the perspective of music theory in seventeenth-century England and from the perspective of the intellectual milieu of Restoration-era England.

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TABLE OF ABBREVIATIONS

AcM	*Acta Musicologica*
AM	*Annales Musicologiques*
ACR	*American Choral Review*
AIHS	*Archives Internationales d'Histoire des Sciences*
AS	*Annals of Science*
BJHS	*British Journal for the History of Science*
CR	*Cambridge Review*
Cul	Cambridge University Library
DNB	Stephen, Sir Leslie and Sir Sydney Lee, ed. *The Dictionary of National Biography*. 22 vols. Oxford: Oxford University Press, 1917.
ES	*English Studies*
HS	*History of Science*
JAMS	*Journal of the American Musicological Society*
JHI	*Journal of the History of Ideas*
JMT	*Journal of Music Theory*
JRMA	*Journal of the Royal Musical Association*
JRME	*Journal of Research in Music Education*
JWCI	*Journal of the Warburg and Courtauld Institutes*
Lbl	London, British Library
MGG	Blume, Friedrich, ed. *Die Musik in Geschichte und Gegenwart*. 14 vols. Kassel: Barenreiter Verlag, 1949-1968.
MM	*Miscellanea Musicologica*
MMR	*Monthly Musical Record*
MR	*Music Review*
MT	*Musical Times*

MQ	*Musical Quarterly*
New Grove	Sadie, Stanley, ed. *The New Grove Dictionary of Music and Musicians*. 20 vols. London: Macmillan, 1980.
NOHM	Abraham, Gerald , Egon Wellesz et al. ed. *The New Oxford History of Music*. 9 vols. Oxford: Oxford University Press, 1957-1990.
NRRS	*Notes and Records of the Royal Society*
Obl	Oxford, Bodleian Library
PMA	*Proceedings of the Musical Association*
PMNTA	*Proceedings of the Music Teachers National Association*
PRMA	*Proceedings of the Royal Musical Association*
PTRSL	*Philosophical Transactions of the Royal Society of London*
RMAC	*Royal Musical Association Chronicle*
RSLBC	Royal Society, Letter Book Copy
SiM	*Studies in Music*
SA	*Scientific American*
SM	*Scripta Mathematica*

INTRODUCTION

I.

During the latter half of 1672, Thomas Salmon (1648-1706), a recent recipient of the degree of Master of Arts from Oxford University, became involved in ". . . the most celebrated musical pamphlet war of the seventeenth century. . ." with the eminent composer Matthew Locke (c. 1621-1677).[1] Salmon instigated this war of words by publishing a treatise on music entitled *An Essay to the Advancement of Musick, By Casting away the Perplexities of Different Cliffs. And uniting all sorts of Musick, as Lute, Viol, Violin, Organ, Harpsichord, Voice, Etc. in one Universal Character* (London: John Macock for John Carr, 1672). In this treatise Salmon proposed the following reforms of musical notation: (1) the replacement of the Renaissance Gamut with seven letters which would repeat themselves at the octave, (2) the placement of these seven notes and their various octaves constantly upon the same lines and spaces, thereby rendering the old clefs obsolete, and (3) the abolition of lute and viol tablature. John Birchensha (c. 1605-1681), a music theorist, composer and Salmon's teacher, provided a lengthy introduction to this treatise in which he hailed Salmon's proposals for simplifying music. The Royal Society also lent Salmon support by recommending his system.[2] Locke, however, was not so impressed with Salmon's proposals and responded with his *Observations Upon a*

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[1]Michael Tilmouth, "Salmon, Thomas," *New Grove,* vol. 16, p. 427.

[2]*PTRSL,* 80 (1671/2), p. 3095. Salmon compared his system to John Wilkins's proposal for a universal language contained in his *An Essay Towards a Real Character and Philosophical Language* (London, 1668). Wilkins, a follower of Francis Bacon and a founding member of the Royal Society, produced a symbolic language that he believed would follow Bacon's dictum that language should impart to the mind an accurate picture of material reality. Salmon believed that his system of notation would serve a similar purpose to that of Wilkins's language, since "Like that late ingeniously invented Universal Character, which, expressing things, and not words, is common to all countries; and may be read by those who agree not in speaking, neither at all understand one anothers discourse." (Salmon, *An Essay to the Advancement of Musick*, p. 29.) In essence, all musicians, regardless of their instrument, would understand Salmon's notation, just as all people, despite the fact that they speak different languages, would be able to comprehend Wilkins's symbolic language.

Late Book, Entituled "An Essay to the Advancement of Musick" (London: W. Godbid for John Playford, 1672). Locke not only defended the traditional system of notation against Salmon's innovations, but attacked vehemently every element of Salmon's proposal.

Not easily silenced, Salmon responded to Locke with his *A Vindication of an Essay to the Advancement of Musick* (London: A. Maxwell for John Carr, 1672). Here, Salmon restated the value of his system and replied in kind to Locke's abuse. The final salvo in this literary skirmish was fired by Locke. His *The Present Practice of Musick Vindicated* (London: N. Brooke and J. Playford, 1673) contains a restatement of his original arguments against Salmon's proposals. Appended to Locke's essay are works by John Phillips (1631-1706) and John Playford (1623-1686). Phillips's contribution to this volume is an ungenerous attack upon Salmon entitled *Duellum Musicum.*[3] John Playford's essay is in the form of a letter to Salmon and he, like Locke before him, dismissed Salmon's attempted revision of musical practice.

Although silenced by Locke et al., Salmon did not desist in exploring various facets of music, and fifteen years after his battle with Locke, he produced a second work on a musical subject, *A Proposal to Perform Musick in Perfect and Mathematical Proportions* (London: John Lawrence, 1688). This treatise contains directions for the employment of just intonation on the viol through the use of interchangeable fingerboards. Appended to this treatise is a letter to Salmon from John Wallis (1616-1703). A member of the Royal Society and professor of

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[3]Phillips labels Salmon, among other things, ". . . a half-witted Trinitonian. . . a Universitie chicken . . . [an] upstart *Ignis Fatuus*. . . ". John Phillips," *Duellum Musicum,*" in Matthew Locke, *The Present Practice of Musick Vindicated* (London: N. Brooke and J. Playford, 1673), p. 25.

mathematics at Oxford, he commented upon Salmon's proposal and suggested possible modifications. Salmon believed that through the use of what he calls "pure intervals," the powerful effects of music described by the ancient Greeks would be recaptured, for music was, in Salmon's opinion, "a celestial accomplishment, which God ordained to enliven our dull affections."[4]

II.

From the end of the seventeenth century until the early twentieth century, historians, biographers, and music theorists have held widely divergent opinions regarding the value and significance of Salmon's musical endeavours. The earliest group of scholars to comment upon Salmon and his treatises fall clearly into pro- and anti-Salmon camps.

The Oxford historian and biographer Anthony á Wood (1632-1695) was an outright supporter of Salmon.[5] That the theorist was a product of Wood's beloved Oxford certainly influenced his discussion of Salmon's proposal and his pamphlet war with Matthew Locke. Wood held Locke in some esteem as a musician, but believed him to be no match in the art of rhetoric and logical argument for an Oxford graduate like Salmon. Wood's comments should not be dismissed for their obvious bias in favour of the Oxford graduate Salmon. Wood was an amateur musician of some note and probably found the simplicity inherent in Salmon's system appealing.[6]

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[4]Thomas Salmon, *A Proposal to Perform Musick in Perfect and Mathematical Proportions* (London: John Lawrence, 1688), p. 3-5. In 1705 Salmon demonstrated his system of fret placement and just intonation to the Royal Society and received praise for his endeavours, yet his proposals were never widely adopted (Thomas Salmon,"The Theory of Musick Reduced to Arithmetical and Geometrical Proportions." *PTRSL* 302 [1705], Irregular pagination).

[5]Anthony á Wood, *Athenae Oxonienses*, vol. 2, second edition (London, 1721), p. 1076.

[6]Anthony á Wood, *The Life and Times of Anthony á Wood*, ed. P. Bliss (London, 1813; reprint, Hildesheim: Georg Olms, 1969), p. 25.

Scottish mathematician and music theorist Alexander Malcolm (1685-1763) also extolled the virtues of Salmon's reforms of music notation. In his *A Treatise of Music: Speculative, Practical and Historical* (Edinburgh, 1721), Malcolm agreed with Salmon that the difficulty in learning to read musical notation was "much increased by the difference of clefs."[7] For Malcolm the elimination of different clefs was extremely advantageous since "the same song or part of any composition may, with equal ease and readiness, be performed on any instrument."[8] Malcolm explained that Salmon's system was rejected because of the :

> ignorance and superstition that haunts little minds, who make a kind of religion of never departing from received customs, whatever reason there may be for changing; or perhaps the pride of the greatest part of professors of this art, joyned to a false notion of their interest in making it [music] appear difficult . . .[9]

Malcolm conceded that Salmon's system would not be revived, but states that he included it as a "piece of theory to explain what might be done" and concludes his discussion of Salmon by asking why the positions of the notes should not be fixed in all octaves, as this would "save a great deal of trouble."[10] The apparent simplicity and logic of Salmon's system of notation probably intrigued a mathematician such as Malcolm, and he accepted Salmon's proposal uncritically.

Roger North (c. 1651-1734), on the other hand, found flaws in Salmon's notational system. Although he accepted that Salmon was a superior rhetorician to Locke in their war of words—Locke being, as North states, "a better musitian than a wrighter of controversie"—Salmon's system "gained no ground; nor had it bin heard of 'till a late politely printed book is pleased once more to hold it forth for a new

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[7]Alexander Malcolm, *A Treatise of Music, Practical, Speculative and Historical* (Edinburgh, 1721), p. 378.

[8]Malcolm, *A Treatise* . . . , p. 382.

[9]Malcolm, *A Treatise* . . . , p. 383.

[10]Malcolm, *A Treatise* . . . , p. 383.

invention of the author's own."[11] The proposal itself is flawed in North's opinion because notes do not consistently occupy either a space or a line. In other words, Salmon's system failed because the note G is placed on a line at the bottom of the staff and a space at the top of the staff.[12] Therefore, the system did not accomplish everything that he claimed for it since the position of the various notes was not completely fixed as Salmon maintained.

John Hawkins and Charles Burney provide extended summaries of Salmon's musical works and of the controversy with Matthew Locke.[13] Hawkins's disdain for Salmon's proposed reforms of notation is evident in the following quotation:

> If Salmon had understood more of music than it appears he did, he never would have thought the knowledge of the cliffs so difficult to attain, nor would he have attempted, by the establishment of a new and universal character, to have rendered unintelligible to succeeding generations the many inestimable compositions extant in his time . . .[14]

Hawkins his attack upon Salmon by stating that "the method of notation contended for by Locke continues without the least variation to this day . . ." and that Salmon and his "universal character" are now very desrvedly forgotten."[15]

Hawkins's discussion of Salmon's other treatise, *A Proposal to Perform Musick in Perfect and Mathematical Proportions* is equally negative.

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[11]Roger North, *Roger North on Music*, John Wilson ed. (London: Novello and Company, 1959), p. 241. The author to whom North refers is J.B. De La Fond (fl. 1725), who in his *New System of Music, both Theoretical and Practical, and yet not Mathematical* (London, 1725), proposed a system of notation differing from Salmon's only in that he used the treble clef instead of the bass clef as the basis for his method of notation. De La Fond did not acknowledge Salmon's influence upon his work.

[12]North, *Roger North on Music*, p. 241.

[13]Sir John Hawkins, *A General History of the Science and Practice of Music* (London: 1776; reprint, Charles Cudworth ed., New York: Dover Publishers, 1963), pp. 715-717. Hawkins takes his summary of *An Essay to the Advancement of Musick* from from Alexander Malcolm's *A Treatise of Musick* (Edinburgh, 1721) pp. 378-384. This treatise will be discussed later in this thesis.

[14]Hawkins, *A General History . . .*, p. 716.

[15]Hawkins, *A General History . . .*, p. 717 .

> This proposal is not mathematical, but simply practical and as all the inconveniences that this author proposes by the use of changeable finger-boards for the viol arise, from the frets, so by the removal of the frets the inconveniences are removed: and we find by experience that persons having a good ear, and nature only for their guide, do in all cases divide the octave most accurately . . .[16]

Charles Burney's opinion of Salmon's *An Essay to the Advancement of Musick* stands in stark contrast to that of Hawkins. For Burney, Salmon's treatise is

> . . . well written, and, though very illiberally treated by Lock, Playford, and some other professors, contains nothing that is either absurd or impracticable; nor could I discover any other solid objection to its doctrines being adopted, than the effect it would have upon old Music, by soon rendering it unintelligible.[17]

Burney makes no mention of Salmon's other musical endeavours, though he indicates that Salmon may have influenced later French theorists:

> Our countryman, Salmon's proposal for reducing all music to one clef, has frequently been revived in France without the least allusion to him or his work; which are both so much out of the question, that the French writers have frequently disputed among themselves the right to the invention. And so late as January 1786, a proposal was published in the *Journal de Paris*, for adopting a single clef, as a new discovery.[18]

Essentially, Hawkins and Burney do little more than rekindle the flames of Locke's and Salmon's original feud. Neither author places the work of Salmon within the context of seventeenth-century music theory, although Burney does stress Salmon's apparent influence on eighteenth-century French theorists.

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[16]Hawkins, *A General History . . .*, p. 716-717.

[17]Charles Burney, *A General History of Music*, vol. 2 (London, 1789; reprint, ed. Frank Mercer, New York: Dover Publishers, 1957), p. 371. Burney claims that "if Salmon's simple and easy musical alphabet were chiefly in use, the base cliff would . . . soon be rendered . . . obsolete . . . ". This is very peculiar, since Salmon employed the bass clef, transposed into different octaves, as the basis for his system.

[18]Burney, *A General History of Music . . .*, p. 980. The first French theorist to suggest the adoption of a single clef was Michel de Saint-Lambert, who proposed it in his *Principes du Clavecin* which was published in Paris in 1702. Others include Michel Pignolet de Montéclair who proposed similar reforms in his *Nouvelle méthode pour apprendre la musique par des demonstrations faciles*, of 1736.

Hugo Riemann (1849-1919) was the first European music historian to discuss Salmon in light of his musical reforms.[19] Like Hawkins before him, Riemann is highly critical of Salmon's proposed reforms of music. Yet, in his short entry on Salmon he claims mistakenly that "in his *Essay to the Advancement of Music* . . . [Salmon] proposed, as something new, to write the letter names instead of notes on the lines."[20] This is an obvious error since Salmon's main reform concerns the abolition of movable clefs, and nowhere in his treatises does he advocate the replacement of conventional notation with letter names.

The first edition of Sir George Grove's *A Dictionary of Music and Musicians* contains no separate entry on Salmon. He is, however, discussed in W. Henry Hadow's article on the spinet for his reference to seventeenth-century English

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[19]Hugo Riemann, *Dictionary of Music*, vol. 2, translated by J.S. Shedlock (London, 1908; reprint, New York: Da Capo Press, 1970), pp. 681-682. French and German predecessors of Riemann, such as Johann Gottlieb Walther, Johann Nikolas Forkel, Ernst Ludwig Gerber, and François Joseph Fétis, provide short, cursory accounts of Salmon and his notational system in their works. Walther's discussion of Salmon, contained in his *Musikalisches Lexicon* (Leipzig: Wolfgang Deer, 1732; reprint, Kassel: Bärenreiter, 1953, p. 539) is by far the briefest of these accounts: "Salmon wrote in English a treatise: *De augenda Musica*, published in 8vo in London in 1667." Walther attributes this piece of information to Martin Lipens *M. Martini Lipenii Biliotheca realis philosophica omnium materiarium, rerum* (Frankfurt, 1682). Forkel, Gerber, Fétis, and Riemann in turn puzzle over this piece of information. Forkel states that the treatise listed by Walther as *De augenda Musica* is the same as *An Essay to the Advancement of Music* (Johann Nikolas Forkel, *Allgemeine Litteratur der Musik oder Einleitung zur kenntniß musikalischer Bücher* [Leipzig, 1792; reprint Hildesheim: Georg Olms, 1962] p. 271). Gerber is more critical of Walther's report and states that the publication date of 1667 is probably in error since Salmon's literary struggle with Locke took place in 1672 and 1673. Fétis cites both Lipens and Walther as sources in his discussion of *De augenda Musica.* He suggests that it is simply a Latin translation of the title of Salmon's *An Essay. . .*(François Joseph Fétis, *Biographie Universelle des Musiciens*, Second Edition (Paris, 1873; reprint, Brussels: Culture et Civilisation, 1963, p. 384). Riemann, the last music historian to make any reference to *De augenda Musica* claims that it was definitely written by Salmon (Hugo Riemann, *Dictionary of Music*, vol.. 2, pp. 681-682). It is extremely unlikely that Salmon could have published a work on music as early as 1667. Aside from the fact that Salmon was then only nineteen years old, he did not begin a serious study of music until some years later. It is fairly safe to conclude that Martin Lipens, after giving a partial Latin translation of the title of Salmon's treatise, provided the wrong date of publication for the treatise. This error resulted in the aforementioned historians' confusion over the possible existence of an earlier work.

[20]Riemann, *Dictionary of Music*, pp. 681-682.

harpsichord maker Charles Haward.[21] Hadow simply restates Hawkins's objections to Salmon's system and claims that Salmon's attempted reform of notation had no influence on later music publishers or composers.[22]

Henry Davey, in his *History of English Music* (London, 1895), considers Salmon's proposals to have had some merit. He labels Salmon a "clerical amateur," and provides a short account of his system together with a summary of Locke's reactions.

> [Salmon] did not go deep enough . . . yet his system would have been an enormous improvement, and was sufficient for the compass of music then in use, admitting also of expansion to our seven-octave instruments.[23]

In his other article on Salmon, Davey notes a link between the writings of the sixteenth-century theorist, William Bathe (1564-1614) and those of Salmon.[24] William Bathe, in his *A Briefe Introduction to the Skill of Song* (London, 1584) states that a knowledge of the Gamut and its long and complicated note names is unnecessary for most musicians.[25] It is unlikely, however, that Salmon was directly influenced by Bathe's work, since Salmon does not make any reference to it and it was not reprinted during the seventeenth century.

In his *The Story of Notation,* C.F. Abdy Williams criticizes Salmon's proposed reforms of notation.[26] He indicates that while Salmon's system is akin to the modern practice of notating tenor voice parts in the treble clef, Salmon's

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[21]Salmon discusses Haward's method of constructing harpsichords in *A Vindication of An Essay to the Advancement of Musick* (1672).

[22]W. Henry Hadow, "Lock," *A Dictionary of Music and Musicians*, vol. 2, ed. George Grove (London: Macmillan, 1878-1890), p.157.

[23]Henry Davey, *History of English Music* (London: J. Curwen and Sons, 1895), p. 309.

[24]Henry Davey, "Salmon, Thomas," *DNB*, vol. 17, p. 696.

[25]William Bathe, *A Briefe Introduction to the Skill of Song* (London, 1584; reprint, Kilkenny, Ireland: Boethius Press, 1982), p. 21.

[26]C.F. Abdy Williams, *The Story of Notation* (London: The Walter Scott Press, 1903; reprint, New York: Greenwood Press, 1969), p. 200.

suggested abolition of the old clefs would "produce more confusion and far more change of clef than before, besides making a topsy-turvy picture of the tune."[27] Williams concludes by stating that the traditional system of clefs was, in the end, no more confusing than Salmon's suggested replacement.

From the eighteenth until the early twentieth century, Salmon's critics held widely divergent opinions regarding the value of his system of notation. Charles Burney and John Hawkins are clearly the source of this divergence, as later historians often simply repeat their assessments of Salmon. More modern writers have attempted to place Salmon in a larger historical context, and some of the most recent see Salmon's contributions within a broader context encompassing philosophy as well as practical music. This is particularly evident among those who comment upon Salmon's *A Proposal to Perform Musick in Perfect and Mathematical Proportions* (London, 1688).[28] Unlike the earlier commentators, who could be grouped very simply into pro- and anti-Salmon camps, modern writers cannot be so clearly demarcated. Essentially, modern writers on Salmon can be grouped, with some overlapping, into the following categories: (1) those who follow Charles Burney and view Salmon's work in terms of notational practices only, (2) those who consider Salmon to be part of the movement towards a theory of music based on tonality rather than modality, and (3) those who see Salmon as more of a musical philosopher or scientist who was influenced both by ancient Greek theories of music and by the trend towards rationality which was manifested in England from the early seventeenth century onwards.

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[27]Williams, *The Story of Notation*, p. 200.

[28]Of the early group of scholars, Hawkins is notable for being the only one to provide any significant comment upon this treatise.

The works of early twentieth-century historians such as Johannes Wolf and Jeffrey Pulver clearly follow Charles Burney and therefore fall into the first category. These writers stress the simplicity of Salmon's system when compared with the system of notation in use during the seventeenth century. According to Wolf, Johannes Caramuel de Lobkowitz's assertion (apparently taken from Caramuel's *Arte Nueva de musica* [1645]) that all music could be written using a single clef was the inspiration for Salmon's proposed reforms. Wolf finds Salmon's system to be not "entirely impractical" and suggests that the modern usage in England of only bass and treble clefs for most music may have been inspired by Salmon's treatise.[29] Wolf echoes Charles Burney in stating that he believes Michel de Saint Lambert's clef reform proposals, contained in his *Principes de Clavecin* (Paris, 1702), along with similar proposals by two other French theorists, Monteclair and Lacassagne, to have been influenced by Salmon.[30]

Jeffrey Pulver calls Salmon's proposal "simple and praiseworthy," but he considers that it was greeted with "fury" from the traditionalist composers, such as Matthew Locke, because they feared "for the safety of their teaching connections."[31] Pulver suggests that some of Locke's apparent dislike of Salmon stems from the fact that Salmon married the daughter of the Regicide, Serjeant [sic] John Bradshaw.[32]

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[29]Johannes Wolf, *Handbuch der Notationskunde*,vol. 2 (Leipzig: Breitkopf und Härtel, 1919), p. 340, and Johannes Wolf, *Die Tonschriften* (Breslau: Ferdinand Hirt, 1924), p. 86. Wolf comments that the first instance of English music being printed with only two clefs was Heptinsall's publication of Purcell's *Orpheus Britannicus* in 1698. Wolf notes that William Tans'ur, an English theorist of the eighteenth century considered Salmon's proposals to be confusing and impractical. Tans'ur's comments can be found, according to Wolf, in *A New Musical Grammar and Dictionary* (London, 1756). Wolf's views regarding Salmon are repeated, almost verbatim, in Gardner Read's *Source Book of Proposed Music Notation Reforms* (New York: Greenwood Press, 1987, p. 114).

[30]Wolf, *Handbuch der Notationskunde*, p. 341. In a later article of Wolf's entitled "Early English Musical Theorists," (*MQ* 25 [1939], p. 429) Wolf suggests mistakenly that Salmon's proposal was for the universal adoption of the alto clef.

[31]Jeffrey Pulver, *A Biographical Dictionary of Old English Music* (London, 1927; reprint, New York: Da Capo Press, 1073), p. 421.

[32]Locke was a staunch supporter of the Royalist cause during and after the civil war.

The following writers represent the second layer of critical opinion: Doris Silbert, Gertrude B. Miller, Lillian M. Ruff, and W.T. Atcherson. While agreeing that Salmon's system represented a simplification of the system of notation, this group of scholars points to Salmon's significance within the larger context of seventeenth-century theory. Silbert, for example, contends that Salmon's treatise was a reaction against the pedagogical methods found in English music tutors in the later seventeenth century, since tutors such as Christopher Simpson's *A Compendium of Practical Musick* (London, 1667) and John Playford's *An Introduction to the Skill of Musick* (London, 1651, first edition) relied on procedures developed to explain the intricacies of modal theory (such as the use of the Gamut to name various pitches and solmization).[33] Salmon's rejection of the nomenclature and symbols of modal theory appear as a manifestation of the gradual shift towards a theoretical system built upon the notion of tonality rather than modality.[34] Silbert concludes by contradicting Hawkins's and Hadow's belief that Salmon's proposed reforms had no influence upon the manner in which music was notated. Silbert suggests that his system may have influenced the way music was published in England, since the second edition of John Playford's *The Musical Companion* (London, 1672), which appeared almost immediately after Salmon's treatise was published, is notated using treble and bass clef only.[35]

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[33]Doris Silbert, "The C Clef in the Seventeenth Century," *MMR* 67 (1937), p. 169.

[34]Silbert believed that Salmon's attack on the Gamut and other vestiges of modal theory was influenced by similar lines of thought expressed by Calvisius in his *Musicae artis praecepta nova et facillima* (1612) and by William Bathe (1564-1614) in his *A Briefe Introduction to the Skill of Song* (1584).

[35]Silbert, "The C Clef . . .," p. 172. Silbert states: " I am inclined . . to believe that this simplifying process may be traced to Salmon's agitation in this regard. . . Prior to this date [1672] I cannot find any other collection of part-songs which so consistently avoids the C clef.." (Silbert, p. 172). R. Alec Harman in his article in *MGG* (vol. 11, p. 1310) and Michael Tilmouth in his article on Salmon in the *New Grove* (vol. 16, p. 427) restate Silbert's assertion that Salmon's proposal to

Gertrude B. Miller repeats Silbert's general assessment of Salmon's significance. In her doctoral dissertation she considers Salmon's attacks on the nomenclature and procedures of modal theory to be his main contributions to the evolution of music theory in England.[36] Miller concludes that Salmon's system

> . . . would have been an enormous improvement. It was sufficient for the music then in use and could have been expanded to accommodate our seven octave instruments.[37]

Lillian M. Ruff repeats Silbert's assessment of Salmon's first treatise, and provides an intriguing explanation of the system's failure to attract many converts.[38]

> Since Italy was the leading model for musical Europe in the seventeenth century, that, had the idea originated there, it might have found universal acceptance: but to expect English musicians to adopt a new system of notation, invented by an Englishman, was asking too much! Musicians did not want the theory of music simplified because they were afraid it would be abused by the lower classes.[39]

W.T. Atcherson labels Salmon's *An Essay to the Advancement of Musick* (1672) "the most famous attempt to reform notation . . . "[40] Like Silbert, Atcherson gives Salmon credit for instigating the English practice of avoiding the movable C clef.[41] Furthermore, Atcherson considers Salmon's second treatise to have had some significance with respect to the emergence of tonal principles:

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reform music notation did have an effect on notational practices which can be traced back to music published by John Playford in the early 1670s.

[36]Gertrude B. Miller, "Tonal Materials in Seventeenth-Century English Treatises," (Ph.D. dissertation, University of Rochester, 1960), p. 54.

[37]Miller, "Tonal Materials . . . , " p. 378.

[38]Lillian M. Ruff, "Thomas Salmon's *Essay to the Advancement of Music," The Consort* 21 (1964), pp. 266-275. Ruff's doctoral dissertation, "The Seventeenth-Century English Theorists," (University of Nottingham 1962), is not available for use outside the University of Nottingham and will not, therefore, be referenced in this study.

[39]Ruff, "Thomas Salmon's *Essay* . . .," p. 268.

[40]W.T. Atcherson, "Symposium on Seventeenth-Century Music Theory: England," *JMT* 16 (1972), p. 10.

[41]Atcherson, "Symposium . . .," p. 10. Atcherson mistakenly claims that Salmon's system placed G on the second line of the staff (p. 10).

> As to that modern concept of relative major/minor, by which I mean in effect the method of pairing which won out in the end– it appears for the first time, as nearly as can be determined, in Thomas Salmon's . . . *A Proposal to Perform Musick in Perfect and Mathematical Proportions* . . .[42]

Atcherson is perhaps overstating the significance of Salmon's pairing of relative major and minor keys, since Salmon himself did not recognize the larger significance of this pairing in terms of the growth of a theory of music based on tonality rather than modality.[43] Salmon's works have also attracted the attention of scholars such as Louis F. Chenette, D.P. Walker, Jamie Kassler, and Penelope Gouk, all of whom are essentially historians of science.[44]

In his doctoral dissertation, "Music Theory in the British Isles During the Enlightenment," Louis F. Chenette considers Salmon's second treatise to be part of the "new wave of mathematical rationalism with regard to musical meanings."[45] This is proven since "Salmon wished to fix the theory of music on the sure foundation of mathematical certainty."[46] Chenette indicates that Salmon himself acknowledged the influence of various ancient Greek writers upon his work in his second treatise.[47] Chenette further states that Salmon wrote his second treatise because he was

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[42]W.T. Atcherson, "Key and Mode in Seventeenth-Century Music-Theory Books," *JMT* 17 (1973), p. 226. Atcherson (p. 227) also indicates that Salmon's first treatise, *An Essay* . . . possibly influenced Saint-Lambert's *Principes du Clavecin* (1702).

[43]Salmon paired these keys because he found that the same fingerboard could be used for both, what in modern nomenclature are C major and A minor.

[44]To this list John Harley, Olive Baldwin and Thelma Wilson can be added. In his article, "Thomas Salmon's 'Perfect Mathematical Proportions'," (*MT* 97 [1956], pp. 191-192) John Harley briefly summarizes *A Proposal to Perform Musick* . . . (London, 1688). Harley obviously considers Salmon to have been influenced by the ancient Greeks, but simply restates Salmon's claims in this regard and does not provide any further discussion of the importance of this matter. Baldwin and Wilson, in an article entitled "Musick Advanced and Vindicated" (*MT* 140 [1970], pp. 148-150) summarize Salmon's and Locke's literary struggle. These writers believe that Salmon viewed music from the "position of a mathematician and a musical amateur" (p. 149) and was therefore at odds with professional musicians like Matthew Locke.

[45]Louis Fred Chenette, "Music Theory in the British Isles During the Enlightenment" (Ph.D. dissertation, Ohio State University, 1967), p. 48.

[46]Chenette, "Music Theory . . .," p. 42.

[47]Chenette, "Music Theory . . .," p. 143.

dissatisfied "with the carelessness of modern practical musicians. . . [and sought] beauty and truth . . . in a return to the true principles of the ancients."[48] D.P. Walker echoes Chenette's assessment of Salmon and states that Salmon's interest in just intonation stemmed from a desire to recreate the "marvellous moral and emotional effects of ancient music."[49]

Jamie Kassler reports in *The Science of Music in Britain, 1714-1830*, that Salmon's writings on music represented two elements of the seventeenth-century intellectual revolution.[50] The first element involves Salmon's attempt to apply to music "Francis Bacon's proposal for real characters, the use of signs having direct contact with reality in order to advance science."[51] The second element involves Salmon's interest in tuning. In his *A Proposal to Perform Musick in Perfect and Mathematical Proportions,* Salmon's approach is as a rationalist who "continued the renaissance tradition in which number held a place of primary importance."[52]

Kassler's assessment of Salmon is expanded in Penelope Gouk's doctoral dissertation, "Music in the Natural Philosophy of the Early Royal Society". According to Gouk, Salmon's work is akin to that of the musical humanists of the sixteenth century. Unlike many Italian and French musical humanists, however,

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[48]Chenette, "Music Theory . . .," p. 48.

[49]D.P. Walker, "Seventeenth-Century Scientists' Views on Intonation and the Nature of Consonance," *AIHS* 27 (1977), p. 265.

[50]Jamie C. Kassler, *The Science of Music in Britain, 1714-1830*, 2 vols. (London: Garland Publishers, 1979), vol. 2, pp. 917-918. Kassler incorrectly describes Salmon as being a Fellow of the Royal Society. Royal Society records indicate that Salmon was never a fellow of the Society; see Michael Hunter, "The Social Basis and Changing Fortunes of an Early Scientific Institution: An Analysis of the Membership of the Royal Society, 1660-1685." *NRRS* 31 (1976), pp. 9-114.

[51]Kassler, *The Science of Music . . .*, p. 918. In essence, Salmon's notational reforms were derived from the beliefs of Bacon concerning the inadequacies of language. Salmon, as has already been noted (see footnote 2), was influenced in his approach to reforms of notation by John Wilkins who attempted to redress the inadequacies Bacon found in language.

[52]Kassler, *The Science of Music . . .*, p. 918.

Salmon investigated only instrumental music and did not discuss text settings.[53] Gouk also links Salmon's attempted reform of notation with the beliefs of such natural philosophers as William Petty, Samuel Hartlib, John Wilkins and his own music teacher John Birchensha, who were adherents to the philosophy of pansophism—a philosophy in which harmony between the senses, reason and the scriptures was paramount.[54] One of the basic tenets of this set of beliefs was "to reduce all subjects to their simplest, clearest elements."[55] Salmon's attempt to simplify notation and his wish to use simple number ratios for the basis of a tuning system are manifestations of this philosophy.

Taken as a group, Chenette, Walker, Kassler, and Gouk place Salmon and his musical work outside the confines of music theory and the development of musical notation practices. While not denying that Salmon's work had significance to music theory, they consider his rational approach to music to be a product of larger trends and developments within the intellectual climate of seventeenth-century England. Hence, they argue that the beliefs of Francis Bacon and those of the musical humanists influenced Salmon's approach to music.[56]

At the most basic level, Salmon's first treatise, *An Essay to the Advancement of Musick,* was a reaction against notational practices of the period. Early commentators limited their discussion of Salmon to this element of his first treatise and pronounced its relative merit in these terms alone. More recent scholars indicate

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[53]Penelope M. Gouk, "Music in the Natural Philosophy of the Early Royal Society," (Ph.D. dissertation, The Warburg Institute, 1982), p. 220.

[54]Gouk, "Music in the Natural Philosophy . . .," p. 18.

[55]Gouk, "Music in the Natural Philosophy . . .," p. 221.

[56]That the musical humanist tradition should be alive at such a late date in England is supported by Dean Tolle Mace in his article "Musical Humanism, the Doctrine of Rhythmus and the Saint Cecilia Odes of Dryden," (*JWCI* 27 [1964], p. 251). Mace claims that the concept of musical humanism did not appear in England until the 1670s and 1680s.

that Salmon's treatises were indicative of the move towards a theory of music based on tonality rather than modality. The most recent research emphasizes Salmon's connections with diverse elements including musical humanism, the emergence of rationalism, and the philosophical tenets of pansophism. In order to assess Thomas Salmon's music treatises from a historical and musical perspective, it is necessary to examine them from the viewpoints of both music theory and philosophy in seventeenth-century England.

CHAPTER 1: THE MUSICAL AND INTELLECTUAL BACKGROUND

The music treatises of Thomas Salmon were influenced by trends in both practical and speculative music theory in seventeenth-century England. As practical music theory, Salmon's works were part of an English musico-theoretical tradition that extended back to the late sixteenth century. Like those of many of his English predecessors, his works were extremely progressive and pointed towards a theory of music based upon tonal principles. With respect to speculative music theory, the work conducted on music by the various members of the Royal Society influenced Salmon's approach to musical topics. The Royal Society also took an interest in Salmon's work and promoted Salmon's ideas for the revision of musical notational practices. Later, the Society heard Salmon present a paper regarding his proposal for incorporating just intonation on the viol.[1]

According to Lorenzo Bianconi,

> Seventeenth-century compositional theory is essentially the theory of vocal counterpoint [and represents] a complete continuity with the previous century . . . the theory of composition remains quite unaffected by changing musical styles . . . Systematic training in composition . . . is—and remains—synonymous with systematic training in counterpoint . . . Contrapuntal theory—i.e. the systematic classification of the intervals melodic and harmonic . . . [constitutes] the sole terms of reference for all types of sixteenth and seventeenth century musical composition.[2]

It is therefore not surprising that the treatise of the sixteenth-century theorist Gioseffo Zarlino, *Le istitutioni harmoniche* (Venice, 1558), served as the basis for much music instruction during the baroque period. In order to complete his training as a

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[1]Thomas Salmon, "The Theory of Musick Reduced to Arithmetical and Geometrical Proportions." *PTRSL* 302 (1705), Irregular pagination.

[2]Lorenzo Bianconi, *Music in the Seventeenth Century*, trans. David Bryant (Cambridge: Cambridge University Press, 1987), pp. 57-58.

composer capable of producing acceptable polyphonic works, the apprentice musician was required to memorize the intricate complexities of modal counterpoint. A comprehensive knowledge of the different modes together with a thorough understanding of the system of hexachords and solmization served as the foundation for musical training until the end of the Baroque period. Yet late-sixteenth century and seventeenth century English theorists were clearly moving away from a theory of music based upon modality to one based upon what might be called proto-tonal principles. For, as Robert Wienpahl states, it is among the English writers that "the major advances in tonal theory are to be found."[3]

Perhaps the main reason for this progressive trend in the works of the English theorists was that, unlike the majority of the theoretical works published by their continental counterparts, most English theorists directed their efforts at the amateur musician. With the exception of Robert Fludd's *Utriusque cosmi maioris scilicet et minoris metaphysica* of 1617 and William Holder's *A Treatise of the Natural Grounds of Harmony* of 1694, no English treatises of the period contain an encyclopaedic theoretical discussion of music comparable to those of Marin Mersenne or Athanasius Kircher. The preponderance of English music theorists produced relatively rudimentary pamphlets concerned with the basics of composition. Since these works were directed at amateurs, there was a need to simplify the pedagogical procedures. This may have been, in effect, the catalyst that sparked the apparently early emergence of concepts and procedures associated with tonality. As W.T. Atcherson states, the need to simplify music theory led to a variety of attempts "to cull out the old complexities of solmization, clefs, mensural notation, and the modes,

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[3]Robert W. Wienpahl, "English Theorists and Evolving Tonality," *ML* 36 (1955), pp. 377.

and to find new ways of approaching counterpoint and composition. . ." which in turn lent seventeenth-century English theory its progressive characteristics.[4]

In many respects Thomas Salmon's music treatises are obvious examples of the trend in English theory away from the concepts and methods of modal theory. His first treatise, *An Essay to the Advancement of Musick* (which will be more thoroughly discussed in chapter three), is largely an attack upon the notational practices, pedagogical methods, and procedures of modality. Salmon realized that the whole apparatus of solmization had become an obstacle on the pathway to becoming a musician. The old procedures had become obsolete and Salmon simply sought to rectify this situation.

His second treatise, *A Proposal to Perform Musick in Perfect and Mathematical Proportions*, is primarily concerned with the use of just intonation on the viol. Yet this work, too, is part of the trend towards a tonal explanation of music in the late seventeenth century. As has already been indicated in the Introduction, this work contains what is perhaps the first acknowledgement of the concept of relative major and minor keys.[5] Salmon, then, recognized an integral principle of tonal music more than thirty years before Rameau codified tonal music theory in his various works.

In order to place Salmon's achievements in their proper historical context, it is first necessary to examine the works of his musico-theoretical forebears to show how Salmon's proposals were a natural outgrowth of trends in English music theory.

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[4]W.T. Atcherson, "Symposium on Seventeenth-Century Music Theory: England," *JMT* 16 (1972), p. 9.

[5]W.T. Atcherson, "Key and Mode in Seventeenth-Century Music-Theory Books," *JMT* 17 (1973), p. 226.

One of the earliest English music theorists whose work exhibits this progressive trait was William Bathe. A graduate of Oxford University, Bathe produced one of the first English theoretical works in which an attempt was made to elucidate music theory expressly for the amateur musician. In his *A Briefe Introduction to the Skill of Song* of around 1584, Bathe attempted to simplify some of the pedagogical procedures associated with modal theory. Although this work has been dismissed as being "a superficial and unimportant little pamphlet . . . ", it was clearly ahead of its time since he recognized the inherent complexity of contemporary musical pedagogy.[6] Bathe believed that the memorisation of the cumbersome note-names of the Gamut was not necessary in order for one to become a competent amateur musician. As he states:

> Old musicians laid down for Song, manifold and crabbed, confused, tedious rules—as for example: though there be in all but six names, *ut, re, mi, fa, sol, la,* having amongst them an easy order; yet could they not by rule declare [which] of these should be attributed to every note, unless they had first framed the long ladder or scale of Gamut . . . where they gave prolix rules, I have given brief rules; where they gave uncertain rules, I have given sure rules.[7]

Bathe's simplification of solmization was, however, soon forgotten since the next and best known English music treatise of the period, Thomas Morley's *A Plaine and Easie Introduction to the Skill of Musick* (London, 1597), retained the old procedures and nomenclature. Morley's goal with this work was to "set out that in our vulgar tongue which of all other things hath been in writing least known to our countrymen . . ."[8] Morley sought to provide instruction for "the average and ignorant

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[6]Thurston Dart, Foreword to: Thomas Morley, *A Plain and Easy Introduction to Practical Music*, ed. R. Alec Harman (New York: W.W. Norton, 1953), p. xiii.

[7]William Bathe, *A Briefe Introduction to the Skill of Song* (London: Thomas Este, c. 1584; reprint, Kilkenny, Ireland: Boethius Press, 1982), pp. 2-3.

[8]Thomas Morley, *A Plaine and Easie Introduction to Practical Musicke* (London, 1597; reprint, ed. R. Alec Harman, New York: W.W. Norton, 1953), p. 5.

music lover of his time" in order that he might become a "competent scholar and a composer able to turn out a madrigal or motet in a sound contemporary style" and be able to move confidently through the intricate system of notation used at various times between 1450 and 1600.[9] Despite the work's title and Morley's intent to simplify music theory for the amateur, he nevertheless presented the amateur with the oppressive task of becoming a fully-fledged composer and musical scholar—a goal which was probably too ambitious for most amateurs.

The majority of the treatises which followed Morley's, like William Bathe's short tract, showed a shift away from modal thinking on the part of seventeenth-century English theorists. Thomas Campion's *A New Way of Making Fowre Parts in Counterpoint* (London, ca. 1615) is a prime example of the direction taken by English theorists at this time.[10] Numerous scholars have shown that this treatise is remarkable for its movement away from the principles that governed modal theory.[11] For example, rather than figuring the numerical relationships of the other voices in a work from the tenor, as was normal Renaissance practice, Campion places the other parts with respect to the bass—a fundamental principle of tonal music theory. For Campion, the bass held the position of primary importance, since:

> the true sight and judgement of the upper three [parts] must proceed from the lowest, which is the Base . . .
> True it is that the auncient Musitians . . . took their sight from the Tenor . . . But I will plainly convince by demonstration

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[9]Thurston Dart, Foreword to Thomas Morley, *A Plain and Easie Introduction to Practical Music*, p. xxi.

[10]Campion's treatise is almost identical to Giovanni Coperario's manuscript *Rules How to Compose* of ca. 1615. As it is impossible to determine with absolute certainty which of these two works is the older, the discussion will concentrate on Campion's treatise, since it was reprinted several times later in the century.

[11]See Christopher Lewis, "Incipient Tonal Thought in Seventeenth-Century English Theory," *SiM* 6 (1981), pp. 24-47.

> that contrary to some opinions the Base containes in it both the Aire, and true judgement of the Key.[12]

According to Manfred Bukofzer, Campion also recognized in principle not only the inversion of intervals, but also that of chords. Hence, "Campion was ahead of his time by more than a century . . ." and set the stage for future developments in music theory.[13]

It is clear that by the second decade of the seventeenth century English theorists were moving away from traditional theoretical concepts and procedures. It is unsurprising, therefore, that by the Restoration period a work such as Christopher Simpson's *A Compendium of Practicall Musick* (London: William Godbid for Henry Brome, 1667) should present "modal theory as an out-dated system."[14] Simpson recognizes only two different scale types which are identifiable by the quality of their thirds:

> Every Composition in Musick, be it long or short is (or ought to be) designed to some Key or Tone, in which the Bass doth alwayes conclude. This Key is said to be either Flat or Sharp: not in respect of itself; but in relation to the flat or sharp third which is joyned to it.[15]

Despite this obvious progress towards a tonal theory of music, English theorists, even as late as Simpson and beyond, were only "midway along in the transition from the modes and hexachords of the Gamut to the tetrachords and heptads of the major-minor system."[16] In effect, the naming of the notes through the use of the Gamut, the inexorably complicated system of solmisation, and the use of

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[12]Thomas Campion, *The Works of Thomas Campion*, ed. Walter Davis (London: Faber and Faber, 1969), p. 327.

[13]Manfred Bukofzer, Introduction to John Coperario, *Rules How to Compose.* (Ms. ca.1610; reprint, San Marino, California: Huntington Library, 1952), p. 19.

[14]Christopher Lewis, "Incipient Tonal Thought . . .," p. 33.

[15]Christopher Simpson, *A Compendium of Practical Musick* (London: William Godbid for Henry Brome, 1667; reprint, Philip J. Lord ed. Oxford: Basil Blackwell, 1970), p. 43.

[16]Franklin B. Zimmerman, Introduction to John Playford, *An Introduction to the Skill of Musick* (New York: DaCapo Press, 1972), p. 24.

innumerable "C" clefs, all of which are part of the old modal system, were still in use late in the century. Memorizing the Gamut and the system of hexachords was still considered an essential part of a musician's training.

To examine Salmon's treatises solely from the perspective of trends in practical music theory, however, does not provide a complete picture of the forces that shaped Salmon's approach to music. It is therefore necessary to provide an account of both the influence of non-musical and more speculative musical factors which affected Salmon's musical studies.

During the late seventeenth century, members of the newly-founded Royal Society were keenly interested in various aspects of music. Ostensibly, the Royal Society was created to promote"the New Science", that is, an approach to the investigation of nature based upon the empirical principles set forth by Francis Bacon. In other words, in order to investigate any natural phenomenon, one should not rely "more on reason than on direct observation."[17] Bacon's concept of empiricism played a large role in the investigations into acoustics and music conducted by members of the Society. The Society's *Journal Book, Philosophical Transactions,* and *Letter Book* all contain references to numerous acoustical experiments conducted by members of the Society.[18] Unsurprisingly, it was Bacon's posthumously published *Sylva Sylvarum* (London: John Haviland for W. Lee, 1627), that provided much of the impetus behind the members' interests in this area.[19] Yet, the methods employed by the members of the Society in their

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[17]Richard Foster Jones, *Ancients and Moderns* (St.Louis: Washington University Press, 1961), p. 43.

[18]See Leta Miller and Albert Cohen, *Music in The Royal Society of London* (Detroit: Detroit Studies in Music, 1987).

[19]Penelope Gouk, *Music in the Natural Philosophy of the Early Royal Society* (Ph.D. Dissertation, The Warburg Institute, 1982), p. 74.

experiments regarding the nature of musical sound are not entirely those set forth by Bacon. For Bacon, the study of the nature of musical sound did not involve a discussion of the mathematical ratios commonly used to describe consonances and dissonances.[20] Bacon's repudiation of the ancient Greeks and their systems of knowledge undoubtedly led to this omission.[21] Bacon's anti-mathematical stance was not, however, adopted by members of the Royal Society, among whom stand some of the most important mathematicians in history. In fact, rather than rejecting mathematics and the writings of the ancient Greeks in their studies of musical sound, the members of the Society found mathematics to be integral to their study of music, and were highly influenced by Pythagorean descriptions of consonance and dissonance. Many of the goals and aims of the Royal Society vis-à-vis music were, as Penelope Gouk asserts, best summarized in the following quotation taken from William Brouncker's *Animadversions* to René Descartes's *Compendiae Musicum*:[22]

> . . . to be a complete musician (please you, to understand Him to be such, as hath not only nibbled at, but swallowed the whole Theory of Musick, i.e. haveing profoundly speculated the Pythagorean scheme of the various sounds arising from various hammers . . .) is required a more than superficial insight into all kinds of Humane learning. For, he must be an . . . Arithmetician, to be able to explaine the causes of Motions harmonicall, by numbers. . . . And . . . a Magician, as to excite Wonder, with reducing into practice the Thaumaturgical, or admirable Secrets of Musick: I meane, the Sympathies and Antipathies betwixt Consounds and Dissounds; the medico-magical Virtues of harmonious Notes . . . [23]

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[20]D.P. Walker calls Bacon's rejection of the mathematical proportions "surprising and perverse . . . as the existence of the mathematical ratios was common knowledge since classical antiquity." (D.P. Walker, *Studies in Musical Science in the Late Renaissance* [London: The Warburg Institute, 1978], p. 120).

[21]See Gouk, "Music in the Natural Philosophy . . .," p. 77-78.

[22]Gouk, "Music in the Natural Philosophy . . .," p. 135.

[23]René Descartes, *Renatus Des-Cartes Excellent Compendium of Musick: With Necessary and Judicious Animadversions*, trans. William Brouncker (London: Thomas Harper for Humphrey Moseley, 1653), pp. [iv-v].

With this, Brouncker, the first president of the Royal Society, presented what would be a set of guidelines for the scientific study of music as undertaken by different individuals associated with the Society. It is clear from this statement that a mathematical approach to the study of music derived from the work of the Pythagoreans would form a large part of the Society's musical activities.[24]

Investigations into the nature of sound and acoustics in general were very much in vogue among many of the Society's members. Mathematics, as Brouncker clearly stated, obviously played a large role in these scientific investigations of music. But what is also evident from Brouncker's statement is that concepts of musical humanism—the power of music to affect the physiological and psychological state of a human being—were a factor in the study of music in late seventeenth-century England.[25] Robert Hooke, the famous physicist and early member of the Royal Society, echoed Brouncker's views in this regard when he stated in his "A Curious dissertation concerning the Causes of the Power and Effects of Musick" that

> [Musick has] power to charm and please the facultys of man . . . [it is active] upon the faculty of man though distemper'd . . . Nor are there wanting . . . very odd notable storys of the wonderfull Power musick has often had upon the passions of men . . . it is commonly known that the sound of those bells rung for a funerall does increase their grief who are sorrowfully concern'd for the disceased's loss. . .[26]

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[24]It is also apparent that Brouncker, like the vast majority of his colleagues, had read Boethius's *De institutione musica* while at university. Much of his commentary is derived directly from Boethius's account of Pythagoras.

[25]Bacon also acknowledged that music had the ability to alter man's psychological state. In his *Sylva Sylvarum* he states: " . . . the Kindes of Musick, have most Operations upon Manners, As to Incourage Men, and make them warlike; To make them Soft and Effeminate . . . " Bacon eschewed the humanists' belief that the power of music rested in the connection between numerical proportions and passions of the human heart and instead stressed that the power of music resulted from the capacity of music ". . . to striketh the Spirits more immediately, than the other senses. . . " Francis Bacon, *Sylva Sylvarum*, Sixth edition (London: J.F. for William Lee, 1651), pp. 31-32.

[26]Hooke's paper is printed with commentary in, Penelope Mary Gouk, "The Role of Acoustics and Music Theory in the Scientific Work of Robert Hooke," *AS* 37 (1980), pp. 573-605. The quotation given above is printed on pages 598.

This continued belief in the power of music to alter a human being's emotional or physical state betrays the continued influence of Platonism upon the scientific community in late seventeenth-century England. As Penelope Gouk states, with respect to the members of the Royal Society:

> Since the time of Pythagoras philosophers evolved cosmologies in which the universe was constructed on proportions expressed in mathematical ratios. Along with music, the subjects of astronomy, arithmetic and geometry (together forming the quadrivium) demonstrated the proportions of the universe, and through their study it was believed that the divine proportions of the deity were revealed. Music was also a mirror of the ethical universe: practical music had a direct effect on the soul and actions of man because it incorporated divine proportions and could prepare the philosopher-musician for the more fundamental enquiry into the harmony of the universe.[27]

Thomas Salmon's proposal to employ just intonation through the use of specially designed viol fingerboards, was influenced by such Platonic concepts. Salmon himself believed that the marvellous effects of music described in various ancient texts could be recreated only through the use of pure intonation. As Salmon himself stated, the marvellous effects of music result from

> The Accurate Observation of Proportions, which the soul is from Heaven inform'd to judge of, and the Body in Unison with it, must Submit to.[28]

The interest in music on the part of the members of the Royal Society was not confined solely to the study of the mathematical and physical aspects coupled with a desire to contemplate ideas connected with musical humanism. Music was also an integral part of various schemes for the development of universal education. Samuel Hartlib, another prominent early member of the Royal Society, actually established and administered, together with Robert Boyle, John Evelyn, and John Wilkins, an

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[27]Gouk, "Music in the Natural Philosophy . . .," p. 8.

[28]Thomas Salmon, *A Proposal to Perform Musick in Perfect and Mathematical Proportions* (London: John Lawrence, 1688), p. 3.

organization known as The Agency for the Advancement of Universal Learning.[29] Essentially, this organization sought the broader dissemination of knowledge among the population and was influenced both by the philosophic tenets of Pansophism and by the writings of Francis Bacon. Pansophism was codified in the writings of the Bohemian theologian Johann Amos Komensky (better known by his latinized surname Comenius). Pansophism, as Comenius described it, was "a single and comprehensive system of human omni-science . . . a system of all things under heaven, which we can know say or do."[30]

The most obvious and concrete development that arose from this interest in universal learning was John Wilkins's attempted creation of a universal language. There was also a Baconian impetus behind this desire to create a universal language. Francis Bacon believed that words "filled the understanding with misapprehensions, because being invented to accommodate vulgar minds . . .[words] were defective."[31] In effect, errors creep into understanding through an incorrect association of words and things. Mistakes of this kind accumulate and act as blockades in the progress of knowledge. As James Knowlson indicates, Bacon believed that

> The frequently nefarious influence of language resulted . . . from two principal imperfections: the admission of words for things which have no existence at all in the real world and the attribution of names to objects in a confused, distorted, and quite contrary manner.[32]

The development of a language understandable by all was considered by Comenius and his followers a necessary step in developing an universal system of

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[29]For a complete discussion of the activities of this organization, see Charles Webster, *The Great Instauration* (London: Gerald Duckworth and Company, 1975), pp. 85-99.

[30]James Knowlson, *Universal Language Schemes in England and France* (Toronto: University of Toronto Press, 1975), p. 11.

[31]R.F. Jones, *Ancients and Moderns* (St. Louis: Washington University Press, 1961), p. 48.

[32]Knowlson, *Universal Language Schemes . . .*, p. 36.

knowledge.[33] John Wilkins's *An Essay Towards a Real Character and a Philosophical Language* (London, 1668) is the best known of the attempts by an English natural philosopher to develop a universal language.[34] The direct significance of these endeavours with respect to music are borne out in the attempts by various individuals associated with the Royal Society who wanted to use musical notation, or music itself, as a means of communication. John Pell, another early member, developed a cypher incorporating musical notation and even attempted to create a new system of musical notation in the 1630s.[35] His opinions of solmization should also be noted, as they are remarkably similar to those of Salmon. Pell considered the entire solmisation system to be an impediment to the advancement of musical knowledge. In British Library Additional Manuscript 4388 (fol. 45) Pell makes the following statements: "The naming of your notes ut re mi fa sol la is arbitrary. If you could keepe right your tune it were no matter how you named any note. Therefore ye keyes and cliffes of ye Gam[ut] . . . are arbitrary and needlesse. The keyes [clefs] are needless and very might as well have been F C G. . . Seeing the greater agreement of tones is in 8s it were not amiss to have seven notes to be placed repeated as often as is needed." Pell, however, proposed a system of notation based upon Arabic numerals as a remedy for the inadequacies of musical notation.[36]

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[33]The pansophists were also closely aligned with a protestant religious movement known as Millenarianism. The Millenarianists believed, among other things, that a prerequisite for the establishment of Christ's kingdom on earth was the dissemination of knowledge to all people. One of the principal founders of this movement was Johann Heinrich Alsted whose writings on music were translated into English by John Birchensha as *Templum Musicum* (London: Roger L'Estrange, 1663). It is possible that Birchensha also held millenarian beliefs and that the source of his musical system was esentially religious. For more on Millenarianism see: R.G. Clouse, "The Rebirth of Millenarianism," *Puritans, the Millenium and the Future of Israel,* ed. Peter Toon (Cambridge: James Clarke, 1970).

[34]On the continent various individuals such as René Descartes, Marin Mersenne, Gasendius, and Jean LeMaire had also pursued the creation of a universal language.

[35]See Gouk, "Music in the Natural Philosophy . . .," p. 131.

[36]This resulted in an extremely complex system and is almost identical to a system used by William Braythewaite in his *Siren coelestis* of 1638.

It is important to note that the Society was also interested in practical music and most especially in the art of composition. The list of those members of the Society who were also amateur musicians is extensive and includes, to name but four of the most famous, Samuel Pepys, John Evelyn, Christopher Wren and Robert Boyle. Samuel Pepys, for example, constantly refers to his musical activities in his famous diary. He found, however, the pedagogical methods used in teaching composition extremely tedious:

> So home to my chamber. . . and getting of the scale Musique [the Gamut] without book, which I at last see is necessary, for a man that would understand music as it is now taught, to understand, though it be ridiculous and troublesome way and I know I shall be able hereafter to show the world a simpler way. But like the old Hypotheses in philosophy, it must be learned, though a man knows a better.[37]

Since the members of the Society had such wide-ranging interests in music, it is therefore not surprising that the composer, theorist, musical pedagogue, and violist John Birchensha should have attracted their interest. Birchensha was closely associated with the Royal Society and is mentioned in the organization's minutes eight times in the period from 1662 to 1676.[38] As Leta Miller states, "the Royal Society was particularly fascinated by [Birchensha's] concept of scientific composition."[39] Birchensha wanted to develop rules for both the mathematical and practical part of music—rules for music that would be all-encompassing and be

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[37]Samuel Pepys, *The Diary of Samuel Pepys*, vol. 9, ed. R. Latham and W. Matthews (Berkeley and Los Angeles: University of California Press, 1976), pp. 157-158. Pepys's own attempts at arriving at an explanation of the nature of musical sound are contained in his "Loose Notes and Queries Musicall" (Obl Ms. Rawlinson A 312 fols. 143-146). This material appears to be a set of preliminary observations on the nature of musical sound, from which Pepys probably intended to develop his own method of composition.

[38]Leta Miller and Albert Cohen, *Music in the Royal Society of London: 1660-1806* (Detroit: Detroit Studies in Music Bibliography, 1987).

[39]Leta Miller, "John Birchensha and the Early Royal Society: Grand Scales and Scientific Composition," *JRMA*, 115 (1990), p. 63.

similar to the rules that governed grammar and rhetoric. Birchensha believed that music was not "inferior to any humane science or art" yet he believed it to be "the most obscure, difficult, uncertain, irregular and imperfect science in the world."[40]

> It is so irregular that there is no certain rule to compose by,. . . this art is more unhappy than any other art in the world: for grammar, logick and all other Sciences are drawn into Rule. . . to compose by a rule is a more noble, artificial and commendable way by which the composer may work with ease, certainty and celerity . . . not only those who skillfully can sing or play on some instrument, may learn to compose, but also those who can neither sing nor play . . . may make good Air and compose 2,3,4 or more parts artificially.[41]

In a later presentation to the Royal Society Birchensha claimed that through his proposed system of composition, he

> will make any rationall Man understand more of the mathematical part of musick in three months than can be known by him in seven years of reading and studying of all the Bookes which have been written concerning this art.[42]

Birchensha stated that he would soon be publishing a book entitled *Syntagma Musicae* in which he would "treat of musick philosophically, Mathematically, and practically . . .and thereby provide a complete compendium of all musical knowledge."[43] His aim was "to unite science and art, and in fact simplify the process of composition by reducing it to a logical set of rules."[44] Unfortunately, Birchensha's *Syntagma Musicae* never materialized.[45] Nevertheless, he employed his rules through his own teaching of

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[40]RSLBC I. p. 166, April 26, 1664.

[41]RSLBC I. pp. 168-169, April 26, 1664.

[42]Lbl Add. Ms. 4388, fol. 68.

[43]Lbl Add. Ms. 4388, fol. 69.

[44]Miller, "John Birchensha and the Early Royal Society . . .," p. 78.

[45]Fol. 69 of Lbl Add. Ms. 4388 is, essentially, an advertisement for Birchensha's *Syntagma Musicae*. Birchensha even included an order form so that those wishing a copy of the book could, for twenty shillings, receive a copy. Since the work never appeared, it seems tha Birchensha was not above what might be termed sharp busines practices. Fragments of Birchensha's rules for composition are extant in Lbl add. Ms. 4910 fols. 42, 51-60, and in Royal Society, The Boyle Papers XLI, no. 1. A more complete discussion of Birchensha's compositional rules is contained in: Leta E. Miller, "John

music to various individuals. Samuel Pepys described Birchensha's rules for composing as being "very good, and the best I believe that ever yet were made."[46] Later, however, he recanted somewhat, and remarked that they were "not so easily to be understood as he [Birchensha] and others make of it."[47] Most of Birchensha's compositions seem to have suffered the same fate as his rules, as only six instrumental works can be attributed to him.[48] Upon hearing a performance of Birchensha's music, the diarist John Evelyn remarked that although Birchensha had "invented a mathematical way of composure very extraordinary: true as to the exact rules of art . . ." but his works" . . . were without much harmonie."[49] The following quotation from Thomas Shadwell's play *The Humourists* (1671) may actually indicate the true usefulness of Birchensha's system of composition: "Berkenshaw is a rare fellow, give him his due, . . . for he can teach men to compose that are deaf, dumb and blind."[50]

Despite Shadwell's rather sarcastic commentary upon Birchensha, members of the Royal Society found his ideas regarding music intriguing, since Birchensha's scheme incorporated many concepts which the Society held dear. Birchensha wanted (1) to unite both the mathematical and practical sides of music, a concept which appealed to both their desire to investigate the nature of musical sound through mathematics and the interest espoused by several members with respect to practical music, and (2) to attempt to simplify the theory of music.

Birchensha and the Early Royal Society: Grand Scales and Scientific Composition," *JRMA* 115 (1990), pp. 63-79.

[46]Pepys, *The Diary . . .*, vol. 3, p. 9.

[47]Pepys, *The Diary . . .*, vol. 5, p. 174.

[48]These works are contained in Obl Ms. Mus. Sch. E411 and have been discussed in Tim Crawford, "An Unusual Consort Revealed in an Oxford Manuscript." *Chelys* 6 (1975-76), pp. 61-68.

[49]John Evelyn, *The Diary of John Evelyn*, vol. 3, ed. E.S. de Beer (Oxford: Clarendon Press, 1955), p. 377.

[50]Thomas Shadwell, *The Humourists* (London, 1671); quoted in: C.D.S. Field, "Birchensha, John," *New Grove*, vol. 2, p. 727.

Thomas Salmon's work on music also attracted the attention of the Royal Society. Salmon's first treatise, *An Essay to the Advancement of Musick* was, like Birchensha's grand scheme, an attempt at making music more accessible to the populace. Salmon's goal, therefore, was akin to that of those members of the Society who were proponents of the ideas of universal learning. Salmon himself believed that his newly invented system of musical notation was a logical and obvious extension of the principles of a universal language set forth by John Wilkins in his *Essay Towards a Real Character and a Philosophical Language*.[51] Since Salmon's attempt at reforming musical notation was an offshoot of the various language and universal learning schemes promoted by various members of the Society, the support given to Salmon by the Society in its *Philosophical Transactions* for his proposal is understandable.[52]

Salmon's musical endeavours were the product of several different elements in late seventeenth-century England. With respect to practical music theorists, there was considerable momentum developing towards an explanation of music that no longer involved concepts and methods associated with modality. Salmon's works are an obvious manifestation of this process, as he recommended the abandonment of modal procedures and was, as W.T. Atcherson stated, perhaps the first theorist to recognize a primary principle of tonal theory—the concept of relative major and minor keys.

The influences that acted upon Salmon from the angle of speculative music theory are somewhat more complex and apparently contradictory. In fact, Platonic notions of Heavenly harmony, and the tenets of Francis Bacon's so-called "new science", in which emphasis was placed on empirical reasoning and a rejection of much of the accumulated knowledge of the classical Greeks, play almost equal roles. In

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[51]Salmon, *An Essay*. . ., p. 29.
[52]*PTRSL* 80 (1671/2), p. 3095.

proposing a simplified system of musical notation, Salmon was applying to music a principle Bacon sought in the creation of a universal language. Salmon considered his notational method to be the musical equivalent of Bacon's call for a language which used a universal character. Salmon's proposal is also closely linked with the concepts of Pansophism and universal learning. He, like his teacher John Birchensha, believed that music should be made more easily comprehensible to the public at large.

Salmon's later work in music illuminates the fact that musical humanism and Neo-Platonic notions of celestial harmony were still part of the intellectual climate in the early eighteenth century. Like Robert Hooke, William Brouncker and other members of the Royal Society, Salmon believed that music was capable of inducing specific emotional states in human beings. For Salmon, this could be achieved only through the re-introduction of pure intonation in musical performance.

CHAPTER 2: BIOGRAPHY OF THOMAS SALMON

Thomas Salmon, like other late-seventeenth-century English writers on music such as Roger and Francis North, was a highly educated amateur musician. But unlike the Norths, who received musical instruction in their youth and became highly proficient performers,[1] Salmon may not have received any training in practical music until he was an adult and had completed his university studies. This is significant because his academic studies at Oxford and the influence of several individuals with whom he became acquainted while a student there set the course for his future musical endeavours.

Thomas Salmon was born on June 24, 1648 in what is now the east London borough of Hackney. According to *The Dictionary of National Biography*, Salmon's father was also named Thomas Salmon and is described simply as a gentleman of Hackney.[2] Since nothing is known of his early life, one can only assume that Salmon, being the son of a 'gentleman', had a reasonably privileged childhood and probably received his early education at a grammar school near his birth-place.

It is unlikely that Salmon received any musical training during his childhood. Since sacred music of all but the most rudimentary kind was banned during the Commonwealth period (1649-1660), it is doubtful that Salmon had any exposure to choral music during his youth. He may have received private instruction on some

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[1]John Evelyn described Francis North as being "very skillful in Musick . . . " John Evelyn, *The Diary of John Evelyn*, vol. 4, ed. E.S. de Beer (Oxford: Oxford University Press, 1955), p. 299. The Norths were born into a highly musical family "where the entertainement of musick in full consort was solemne and frequent . . ." Roger North, *Roger North on Musick*, ed. John Wilson (London: Novello and Co., 1959), p. 34.

[2]*DNB*, vol. 17, p. 696. Although there is no record of Salmon's mother's name, she is reported to have been the sister of the Regicide, Colonel John Okey (?- 1662); see F.W. Kuhlicke, "The Salmons of Meppershall," *Bedfordshire Magazine* 1 (1948), p. 177.

instrument, since the Lord Protector Oliver Cromwell and his Puritan followers were not opposed to secular music.[3]

Salmon entered Trinity College, Oxford in April, 1664.[4] It is probable that Salmon received his earliest instruction in music theory while at Oxford. The medieval trivium and quadrivium served as the essential curricula of the universities during this period, and instruction in music was based on readings and lectures taken from Boethius's *De institutione musica.* Salmon's knowledge of Pythagorean concepts of consonance and dissonance and his fascination with notions of the miraculous power of music (elements which were central to his work in music) can be traced to his familiarity with this treatise.

During the period of the Commonwealth, the parliamentary government under Cromwell replaced many Royalist professors at Oxford with individuals who were at odds with the old syllogistic approach to learning and who sought knowledge empirically, as prescribed by Francis Bacon.[5] Bacon was highly critical of the entire notion of humanism. As Charles Webster states, Bacon fought against "excessive admiration for classical authors, . . . concentration on the study of language and a taste for elaborate preaching [which] had resulted in an affectionate study of

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[3]Interest in so-called "private musick" among the middle-classes exploded during the 1650s. The great number of music instruction books for amateurs which appeared in this decade attests to this fact. For more information on the effect of Puritan domination on music in England during this period see Percy A. Scholes, *The Puritans and Music* (New York: Russell and Russell, 1962).

[4]At this time there were no entrance examinations for the prospective Oxford student. Permission to enter a particular college was granted only by the head of that college. As W.A. Pantin states, the head of a college "might well put the candidate to some rapid literary test . . . but this was entirely at the discretion of the college. . . " in *Oxford Life in Oxford Archives* (Oxford: Clarendon Press, 1972), p. 7.

[5]According to Phyllis Allen,"The Puritans 'intruded' men of liberal tendencies into the faculties of the universities. Oxford, rather strongly Royalist during the Civil War, suffered from a general turning out of all the King's men. In return, widespread Puritan reforms brought brilliant men to the University from Gresham College in London. Cromwell had heard of the club, or "Invisible College," as Robert Boyle called it, that had been meeting regularly at Gresham College, and from it he made his new appointments. See: Phyllis Allen, "Scientific Studies in the English Universities of the Seventeenth Century, " *JHI* 10 (1949), p. 231.

eloquence and copie of speech [thereby] leading men to hunt more after words than matter."[6] In his *Novum Organum*, he criticized the humanistic method of teaching as follows:

> Again, in the customs and institutions of schools, academies, colleges, and similar bodies destined for the abode of learned men and the cultivation of learning, everything is found adverse to the progress of science. For the lectures and excercises there are so ordered that to think or speculate on anything out of the common way can hardly occur to any man . . . For the studies of men in these places are confined and as it were imprisoned in the writings of certain authors . . .[7]

Bacon advocated the first-hand study of nature or empirical approach to learning as opposed to the memorization of facts and a syllogistic system of reasoning.

With the restoration of the Monarchy in 1660, many of the old Royalist Heads of Colleges and professors were reinstated at Oxford, although several of the Puritan appointees retained their positions after the Restoration.[8] It was the influence of the Puritan appointees that allowed Oxford to retain its position as centre for the new approach to learning. One of these Puritan appointees was John Wallis.[9] A founding member of the Royal Society, Wallis was among a group of individuals who were interested in establishing a system of universal learning.[10] Salmon probably became acquainted with Wallis while a student at Oxford, and it was

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[6]Charles Webster, *The Great Instauration* (London: Duckworth, 1975), p. 105.

[7]Francis Bacon, *The New Organon*, ed. Fulton H. Anderson (Indianapolis and New York: Bobbs-Merrill Company, 1960), Book 1, paragraph XC, p. 89.

[8]Charles Edward Mallet, *A History of the University of Oxford*, vol. 2 (London: Methuen and Co., 1924), p. 416.

[9]According to Thomas Sprat, "The University [Oxford] had, at that time, many members of its own, who had begun a free way of reasoning; and was also frequented by some Gentleman, of Philosophical Minds, whom the misfortunes of the Kingdom, and the security and ease of a retirement among Gown-men, had drawn thither." Thomas Sprat, *The History of the Royal Society of London*, (London, 1667) pt. II, p. 53. It is important to note that many of these men formed the nucleus of The Royal Society when it was founded in 1660. Wallis, one of the most respected mathematicians of the seventeenth century, was appointed Savilian Professor of Geometry in 1649 and held this post until his death in 1703.

[10]Charles Webster, *The Great Instauration* (London: Gerald Duckworth, 1975), p. 97.

through him that he was introduced to Baconian concepts of empiricism and notions of universal learning. Salmon's close connection with Wallis is illustrated by the fact that, while involved in a letter war with Matthew Locke, Salmon voiced his response to Locke's criticism of his proposal through Wallis. There also exists some correspondence between Salmon and Wallis, and the latter provided a commentary to Salmon's *A Proposal to Perform Musick in Perfect and Mathematical Proportions,* which was published as an appendix to this work.

Although Salmon's formal study of music was in all likelihood limited to Boethius's *De institutione musica*, this is not to suggest that opportunities for practical music-making did not exist for students outside the confines of academe.[11] The seventeenth-century Oxford historian, Anthony á Wood, indicated that during his time as a student at Oxford, he participated with other students in weekly musical meetings.[12] There were also opportunities for students to engage the University's music masters as private music instructors.[13] Unfortunately, it is impossible to know with certainty if Salmon participated in any musical activities or whether he sought private tuition.

Salmon completed the requirements for the degree of Master of Arts in July, 1670.[14] By the standards of the day, Salmon would have been considered a highly educated gentleman, and therefore able to seek a high position. It seems, however, that at this point in his life he turned whole-heartedly to the study of music. What transpired to spark Salmon's sudden intense interest in music? It is possible that

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[11]Nan Cooke Carpenter, *Music in the Medieval and Renaissance Universities,* (Norman Oklahoma: University of Oklahoma Press, 1958), pp. 159 and 165.

[12]Anthony á Wood, *The Life and Times of Anthony á Wood*, ed. P. Bliss (London, 1813; reprint, Hildesheim: Georg Olms, 1969), p. 25.

[13]Carpenter, *Music in the Medieval. . .*, p. 171.

[14]Anthony á Wood, *Fasti Oxonienses,* ed. P. Bliss (London, 1820; reprint, Hildesheim: Georg Olms, 1969), p. 298.

Salmon, who may have had little or no previous training in practical music, found himself outside the mainstream of the more refined currents of Restoration society, where the ability to understand and perform music was still considered a gentlemanly virtue. Henry Peacham, in his *The Compleat Gentleman,* advised young, would-be gentleman,

> I desire not that any noble or gentleman should, save at his private recreation and leisureable hours, prove a master in [music] or neglect his more weighty employments, though I avouch it a skill worthy the knowledge and excerise of the greatest prince . . . I desire no more in you than to sing your part sure and at the first sight withal to play the same upon your viol or the exercise of the lute, privately, to yourself.[15]

Shortly before graduating from Oxford, Salmon approached the most eminent English composer of the early Restoration period, Matthew Locke (ca. 1621- 1677), Composer-in-Ordinary to Charles II, with the intent of procuring lessons in composition. But Locke was uninterested in instructing Salmon and referred him instead to "Mr. Simpson's *Compendium of Practical Musick* [London, 1667] for the first rudiments, and to Mr. Birchensha for his further advance . . . "[16] Salmon followed these instructions and began studying composition under the tutelage of John Birchensha who, as we have noted, was closely connected with the Royal Society and was attempting to develop a simplified system of music theory.

The influence of Birchensha's schemes for a simplified theoretical system of music are manifested in Salmon's *An Essay to the Advancement of Musick* (London: John Carr, 1672), which appeared less than three years after the meeting of the two men. Salmon's main objective in this treatise was to establish a simplified system of notation in which the following would be accomplished: (1) the replacement of the

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[15]Henry Peacham, *The Compleat Gentleman* (London, 1622; reprint, ed. V.B. Heltzel, Ithaca, N.Y.: Cornell University Press, 1962), pp. 111-112.

[16]Matthew Locke, *Observations Upon a Late Book, Entituled, "An Essay to the Advancement of Music"* (London: William Godbid for John Playford, 1672), p. 3.

complicated gamut with seven letters which encircle themselves in several octaves, (2) the placement of the seven notes and their various octaves constantly upon the same lines and spaces, thereby rendering the old clefs obsolete, (3) the use of the the letters Tr, M, and B, which signify treble, mean, and bass, to replace clef symbols and signify in which octave a piece was written, and (4) the abolition of tablature notation. In essence, Salmon was attacking well-established methods of notation and pedagogy. Birchensha's concept of a system of simplified composition was not the sole influence upon Salmon. He was clearly influenced by schemes for the creation of a universal language, with which several members of the Royal Society, most notably John Wilkins, were concerned.[17] Salmon believed that the adoption of his notational system would have an effect on music analogous to the desired effect of Wilkins's language of so-called real characters. Ideally, all musicians, regardless of their instrument, would understand Salmon's notation, just as all people, despite the fact that they speak different languages, would comprehend Wilkins's symbolic language. The Royal Society found Salmon's system worthy of merit and recommended its adoption in a short review of the work.[18] The similarity between Salmon's system and the schemes for the promotion of universal learning advocated by various members of the society undoubtedly appealed to the organization as a whole.

Unfortunately for Salmon, other prominent members of Restoration society were decidedly unimpressed by the proposal. The most vocal and from a musical perspective the most important of those opposed to Salmon's reforms was Matthew Locke. As a court musician in the service of Charles II, Locke held the following

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[17]Wilkins's system is explained in his *An Essay Towards a Real Character and a Philosophical Language* (London, 1668).

[18]See *PTRSL* 80 (1671/2), p. 3095.

titles: Private Composer-in-Ordinary to the King, Composer in the Wind Musick, and Composer for the Band of Violins. Locke was clearly among the most eminent English composers of his day and his opinion regarding musical matters would have been regarded with respect. Yet, as Murray Lefkowitz remarks, " Locke was vain, contentious, and vindictive, a vigorous and vituperative crusader for musical causes [and] his pen was vitriolic,"—qualities which were much in evidence in his response to Salmon's *An Essay . . .*[19]

Locke's initial condemnation of Salmon's proposals for musical reform is contained in his *Observations Upon a Late Book, Entituled, An Essay to the Advancement of Musick.* The work is addressed to Locke's colleagues in the Chapel Royal and opens with this comment:

> The abusiveness, not the Excellency of the intended Universal Character gave me occasion of presenting you these Remarques wherein I have endeavoured to manifest the falsity, insignificancy, contradictory and (in some parts) impossibility of its author's Proposals.[20]

It is important to note that Salmon himself invited this sort of response from established music teachers and composers such as Locke. Salmon cynically appraised contemporary music masters and stated that they were certain to discredit his system because it " . . . will halve their teaching time" and as a consequence reduce their income.[21] On these people Salmon cast his aspersions:

> But if after this, Musick-masters shall double the time in teaching their scholars, in hopes of double-gain; or their scholars be such fools to undergo that expense of time and trouble; give me leave to laugh, and let them have their labour for their pains.[22]

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[19]Murray Lefkowitz, "Locke, Matthew," *New Grove*, vol. 11, p. 109.

[20]Matthew Locke, *Observations Upon a Late Book . . .* (London: William Godbid for John Playford, 1672), p. 1.

[21]Salmon, *An Essay . . .*, p. 26.

[22]Salmon, *An Essay . . .*, p. 27.

Locke was therefore responding to what he considered to be a slight upon the honour of professional music instructors. This may account for some of his vitriol.

In general, however, Locke sought to preserve the statusquo with respect to musical notation and pedagogical methods. To his credit, he does point out some of the notable shortcomings of Salmon's system by demonstrating that Salmon's notational method will require a change of clef when a melodic line moves beyond the confines of a single octave. He also illustrated the system's inadequacies with respect to keyboard instruments and the lute. Nevertheless, Locke's overall tone is spiteful and malicious, as his final commentary on Salmon's clef symbols (Tr, M and B) clearly shows:

> But more especially the tender Feminine Sex—a learned Gentleman of the Authors Acquaintance & Profession, when he professed Physick assured me: *B M T* have a double sense; in the first place, Bass, Mean, Treble; in the second, the most Essential Balsam of the World, viz. A Man *T* erected, apply it to the Basis of the Patient with a gentle motion, and twill give present Ease. Which doubtless will infinitely oblige those amorous Affecters of his way of Prick-song . . .[23]

The twenty-four year old Salmon did not shrink from responding in kind to Locke and produced his *A Vindication of An Essay to the Advancement of Musick* in the form of a letter to John Wallis.

Salmon opens his response to Locke by thanking Wallis for his and the Royal Society's support of his scheme. Salmon states that with the endorsement of such learned men he was "not much sollicitious what the less-learned part of the world thought concerning it [his proposal]."[24] Hence, the treatment he received from Locke was, as he states, "more than I expected to be . . . so killingly convinced and utterly

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[23]Locke, *Observations Upon . . .*, p. 38.

[24]Thomas Salmon, *A Vindication of an Essay to the Advancement of Musick* (London: A. Maxwell for John Carr, 1672), p. 1.

destroyed by any single observer."[25] Salmon's main purpose in this tract was to demonstrate that scientifically and mathematically sound principles are at the root of his system. Of course, Salmon finds many opportunities to berate Locke contemptuously, describing him as "a very *grand Observer,*" "the Gigantick-Champion of Musick," and "this huge Destroyer."[26]

Appended to *A Vindication . . .* is a letter of support for Salmon from an individual identified only as N.E. of Norwich. This anonymous person praises Salmon and his system by stating that,

> I have received considerable advantages from your Musical essay etc. I was much concerned to see so happy a design so scurriously reduced - spite to yourself, rather than any sober dislike of your "Essay" that it is plain his [Locke's] design was not to return an answer but a libel.[27]

Locke's final rebuke of Salmon's system is found in his *The Present Practice of Musick Vindicated* (London: N. Brooke for John Playford, 1672). Aside from adopting a rather more sarcastic tone in this work than in his previous attack upon Salmon, Locke essentially repeats his initial condemnations of Salmon's system.

Appended to Locke's *The Present Practice . . .* are the works of two other opponents of Salmon. The first of these is a singularly nasty commentary on Salmon's and Locke's literary struggle by John Milton's nephew John Phillips, entitled *Duellum Musicum.*[28] The low literary level of Phillips's assault on Salmon indicates that he shared none of his uncle's talent in this regard. The following passage is indicative of the entire essay:

> [Salmon is] a half-witted Trinitonian . . . A *Universitie Chicken* that *peep-peeps* about the Town still, with his Shell upon his head. What strange *Cimmerian* darkness have we liv'd in

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[25]Salmon, *A Vindication . . .*, p. 1.
[26]Salmon, *A Vindication. . .*, pp. 2-4.
[27]Letter from N.E. of Norwich to Thomas Salmon, in Salmon, *A Vindication . . .*, p. 1.
[28]*DNB*, vol. 15, pp. 1092.

> hitherto, that we must be beholding to this upstart *Ignis Fatuus* to light us into the right Paths of Musick?[29]

The other response to Salmon, provided by the publisher John Playford, is much more important and less mean-spirited in its tone than those items which preceded it. Playford illustrates that Salmon's complaints against the use of C clefs were no longer valid, as he (Playford) publishes choral music using only two clefs, the treble and bass.[30] Salmon did not reply to Locke and his supporters after this point. Perhaps he realized that the weight of tradition was not to be moved.

Late in 1672, Salmon retreated to Mepsal (now Meppershall), Bedfordshire, where he was appointed vicar.[31] Sometime prior to this he had married Katherine Bradshaw (ca. 1650-1731), who was reported to have been the daughter of the Regicide, John Bradshaw (1602-1659).[32] It is of some importance that Colonel John Okey (?-1662), another of the Regicides, was Salmon's uncle.[33] Hence, it is possible that this close family connection with Charles I's executioners was a source of the arch-royalist Locke's dislike of Salmon.[34] It is unlikely that Salmon himself actually harboured any anti-royalist sentiment. The oath of allegiance to the Crown that Salmon and all other university students were required to swear before they could be formally admitted to either Oxford or Cambridge attests to this fact.[35] Also,

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[29]John Phillips, *Duellum Musicum,* in Matthew Locke, *The Present Practice of Musick Vindicated* (London: N. Brooke for John Playford, 1672), p. 25.

[30]John Playford, Letter to Thomas Salmon in Matthew Locke, *The Present Practice . . .* p. 93.

[31]Salmon simultaneously held a similar position in the Parish of Ickleford, Hertfordshire, however he resided at Meppershall for the remainder of his life and travelled to Ickleford as the need arose. See Kuhlicke, *The Salmons of Meppershall,* p. 178.

[32]Katherine Salmon's obituary notice, which appeared in *The Gentleman's Magazine* (vol.. 1, no. 5 [May, 1731], p. 220) states that "This Gentlewoman was not Daughter to Sergeant Bradshaw, who signed the warrant for executing K[ing]. Charles I."

[33]Kuhlicke, "The Salmons . . .," p. 179.

[34]Jeffrey Pulver, *A Biographical Dictionary of Old English Music* (London, 1927; reprint, New York: Da Capo Press, 1973), p. 422-423.

[35]V.H.H. Green, *A History of Oxford University* (London: B.T. Batsford, 1974), pp. 87-88.

Salmon's position in the Church of England seems to preclude his holding anti-royalist views.

Between 1673 and 1690 Salmon and his wife had ten children. Of the six who survived to adulthood, two sons, Nathaniel (1675-1742) and Thomas (1679-1767), became authors of some note in the eighteenth century.[36] Aside from his two music treatises, Salmon also authored the following works: *The Catechism of the Church of England* (1699), *A Discourse concerning Baptism and Education of Children as the best means to advance the Religion and Prosperity of the Nation, whereunto are annexed proposals for the settlement of free-schools in all parishes for education of the children of the poor* (1701), *A New Historical Account of St. George for England, and the original of the most Noble Order of the Garter* (1704), and the posthumously published *Historical Collections relating the originals conversions and revolutions of the inhabitants of Great Britain to the Norman Conquest, in a continued discourse* (1706).

Salmon seems to have maintained an interest in the study of music throughout the 1670s, as his name appears in the subscriber's list for Thomas Mace's *Musick's Monument* (1677). By the mid-1680s, Salmon was again investigating musical theory. His renewed interest was sparked by John Wallis's 1682 Latin translation of Ptolemy's *Harmonics*. This summary of the known ancient Greek achievements in music theory led Salmon to study the systems of tuning employed by the ancient Greeks, and inspired him to develop a method by which just intonation could be

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[36]F.W. Kuhlicke, pp. 179-180. The following is a listing of the birth and deaths of Salmon's children: Thomas (c. 1673-1674), Nathaniel (1675- 1742), Elizabeth (1676-?), Thomas (1679-1767), John (1680- ?), Katherine (1681- ?), Lawrence (1682-1694), William (1685- ?), Benjamin (1687-1691) and Ambrose (1690-1695). Birth and death records are contained in the County Hall, Bedford, England.

employed on modern instruments.[37] In a letter sent by Salmon to John Wallis on December 31, 1685, Salmon stated that:

> I have no thoughts of proposing or publishing any thing, till I find some practicall success in what I have already done; for except wee can introduce the expression of purer proportions into our performances, the study of them may bee pleasant, but it cannot be useful.[38]

In order to make use of "purer proportions," Salmon stated that he had determined the necessary positions for the frets on a viol fingerboard, and that different fret positions may be needed for each key.[39] In his response, Wallis suggested that what Salmon proposed could be accomplished "If for every key . . . you have different fingerboards . . ."[40] This suggestion of Wallis's led in 1688, to Salmon's *A Proposal to Perform Musick in Perfect and Mathematical Proportions* (London: J. Lawrence, 1688). Essentially, this work contained a proposal for the use of just intonation on the viol through the incorporation of removable fingerboards. Salmon believed that the use of pure intervals would greatly improve the state of music:

> All the best Proportions, are the best Chords of Musick, and strike the Ear with a pleasure agreeable to the dignity of their Numbers. The effects of this the Sensualist is satisfied with, and desires to seek no further. But is it not grateful to every Gentleman, . . . to know the divine Harmony of the pleasure he enjoys? Is it not the duty and Felicity of a Rational Being, to consider how the whole System of the World is framed in Consort? [41]

It is clear from this that Salmon's approach to the study of music was influenced by Neo-Platonic concepts. As Penelope Gouk states, Salmon considered "*musica*

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[37]Penelope Mary Gouk,"Music in the Natural Philosophy of the Early Royal Society." (Ph.D. dissertation, The Warburg Institute, London, 1982), p. 218.

[38]Obl Ms. English Letters, C. 130, fol. 27.

[39]Obl Ms. English Letters, C. 130, fol. 27.

[40]Obl Ms. English Letters, C. 130, fol. 28.

[41]Thomas Salmon, *A Proposal to Perform Musick in Perfect and Mathematical Proportions* (London: John Lawrence, 1688), p. [i-ii].

instrumentalis . . . an audible expression of *musica mundana* and that it is the 'dignity' of the numbers of the consonances that gives them their special quality."[42]

Shortly after the publication of Salmon's *A Proposal* . . ., the following advertisement appeared in the *London Gazette* (March 21, 1689):

> R. Meares will fret lutes, viols, etc., according to the system devised by Thomas Salmon, approved by the Mathematical Professors of both Universities.[43]

Salmon, it seems, had some success in convincing practical musicians to convert their instruments to his system. In fact, Salmon's final foray into music involved a demonstration of viols before the Royal Society in which his specially designed fret boards were incorporated. This demonstration occurred in August 1705 and is recorded in the *Philosophical Transactions of the Royal Society* (Vol. 302). Salmon claimed, once again, that through the use of precise intervallic ratios music would once again regain the power attributed to it by the ancient Greeks. As Salmon stated "the Theory of Musick . . . may be fixed upon the sure foundations of Mathematical certainty . . . and the more exact the proportions, the better the Musick . . ."[44]

In two letters of late 1705 and early 1706, addressed to Sir Hans Sloane, the President of the Royal Society, Salmon thanked the Society for the favourable reviews of his work and concluded that his research would,

> thereby become known to the learned men of the World, that if anything can be objected against them it may be consider'd; but if all holds good . . . then is the theory of Musick settled, which being accommodated to the present practice wee may proceed to those emprovements wherein the Grecians excelled us.[45]

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[42]Gouk, "Music in the Natural Philosophy . . .," p. 226.

[43]Michael Tilmouth, "A Calendar of References to Music in Newspapers Published in London and the Provinces (1660-1719)," *RMAC* 1 (1961), p. 8.

[44]Thomas Salmon, "The Theory of Musick Reduced to Arithmetical and Geometrical Proportions," *PTRSL* 302 (1705), irregularly paginated.

[45]Lbl Sloane Ms. 4040, fol. 103

The area in which Salmon believed that the Ancient Greeks were superior to modern musicians was in so-called "enharmonick" or quarter tone music. Salmon informed Sloane that he was interested in conducting experiments in this regard but would require a patron to assist him financially as "there is a charge and interest requisite greater than a private person can sustain . . ."[46] It is impossible to know how much progress Salmon made in this area before his death in August of 1706, though it is important to note that Salmon retained his interest in musical humanism until the end of his life.

In summary, Thomas Salmon was a highly-educated amateur musician. It is likely that he did not receive any instruction in practical music until he had completed his studies at Oxford, and it appears that his first music teacher, John Birchensha, played a major role in shaping Salmon's approach to the subject of music. Birchensha's zeal for completely overhauling all aspects of music undoubtedly infected Salmon and led to the publication of *An Essay to the Advancement of Musick.*

But Birchensha's influence was not the only factor which guided Salmon in his future musical endeavors. The Oxford mathematician, John Wallis and other members of the Royal Society, most especially John Wilkins, the creator of a universal language, also played a role in steering Salmon's work. In fact, Salmon believed that the ultimate aim of his method of music notation—the development of a universally understandable system of notation—was identical to Wilkins's goals for his language.

Although Salmon's *An Essay* . . . was met with a barrage of disapproval from Matthew Locke and later John Playford, he did not shy away from defending

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[46]Lbl Sloane Ms. 4040, fol. 104.

himself from the verbal onslaught they directed at him. Salmon excelled at the art of rhetoric, as his response to Locke attests. But his system was not flawless and he could not, finally, overcome the weight of tradition upheld by those who sought to maintain the stausquo.

Salmon's later musical endeavours involved an attempt to incorporate just tuning into contemporary practice in the hope that the power of music described by the ancient Greeks could be recaptured. In his *A Proposal to Perform Music in Perfect and Mathematical Proportions*, he described how viol fretboards could be constructed to accomplish this goal and later demonstrated instruments constructed in this manner before the Royal Society. His work indicates that the concepts of musical humanism were still an important part of the intellectual climate of late-seventeenth-century England.

CHAPTER THREE: THE TREATISES

I. *An Essay to the Advancement of Musick*

John Birchensha's introduction to Thomas Salmon's *An Essay to the Advancement of Musick* is a withering condemnation of contemporary musical practices which opens as follows:

> There is not any art which at this day is more rude, unpolish'd and imperfect of the writings of most of the ancient and modern authores, than musick; for the elementary part thereof, is little better than an indigested mass, and confused chaos of impertinent characters and insignificant signs. It is intricate and difficult to understand: it afflicts the memory, and consumeth much time before the knowledge thereof can be attained: because the cliffs are divers, their transposition frequent; the order and places of notes very mutable; and their denominations alterable and unfixed . . .[1]

In order to rectify these deficiencies, Birchensha suggests the adoption of Thomas Salmon's simplified method of musical notation. This newly-devised system is a vast improvement over the current system, and all people, Birchensha assures the reader, "will certainly applaud the proposal; where that which makes the advantage, makes it also easie, and requires but half the pains to double the accomplishment."[2] Birchensha's claims regarding Salmon's system of notation are similar to those he made for his own proposed revision of music theory which he presented to the Royal Society in 1664. But whereas Birchensha's goal was to overhaul completely every aspect of music theory, Salmon's objective was much more limited in scope and concerned principally with reforming notational practice and basic pedagogy.

Salmon's proposals were not, however, without a larger significance in musical and non-musical contexts. From a musical perspective, they represented an attack upon the procedures, nomenclature, and notational practices of modal theory.

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[1]John Birchensha, introduction to *An Essay to the Advancement of Musick,* by Thomas Salmon (London: John Macock for John Carr, 1672), p. [i].

[2]Birchensha, Introduction . . . , p. [i].

Like English theorists before him, Salmon was in the vanguard with respect to the evolution of a theory of music based upon tonal rather than modal principles. From a non-musical perspective, *An Essay* . . . displays the influence of an attempt by Royal Society member John Wilkins to develop a universal language.

The work itself is a ninety-two page monograph which is divided into six chapters entitled: I. *Musick Truly Valued from its Authentick Creator,* II. *The Scale of Musick Reduced to Seven Notes,* III. *The Same Seven Notes and Their Octaves are ever Situated upon the Same Lines and Spaces,* IV. *The Design Applyed,* V. *The design Applyed to Instrumental Musick,* VI. *The Objections Answered, The Conclusion.*

The first chapter begins with a discussion extolling music's virtues as a recreation. Music's main advantage over other forms of recreation, Salmon stated, rests with the fact that it "refreshes the soul" unlike, for example, card games, which tend to "rack and torment the soul."[3] Music also can be of enormous benefit to one's physical well-being, since singing is an excellent exercise for the lungs in that it "quickens the blood and . . . assists in the separation of the sluggish phlegm."[4] At the heart of Salmon's proposal, then, is a desire to promote music as the ideal recreational activity for all individuals. Unfortunately, Salmon believed that current methods of musical instruction and notation were not conducive to the enhancement of music as a recreational activity. The contemporary system of basic music theory and notation was so complicated, he insisted, that many people became discouraged before they could experience the joy of music. In order to rectify this problem, Salmon suggested

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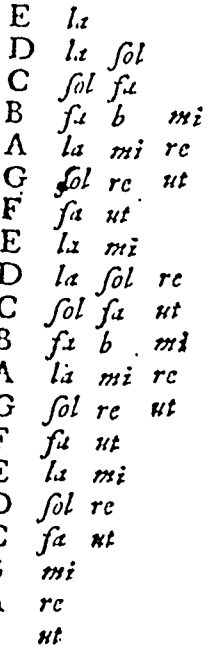
[3]Salmon, *An Essay* . . . , p. 5.

[4]Salmon, *An Essay* . . . , p. 7. This comment suggests that Salmon was influenced by the beliefs of the musical humanists who asserted that music could aid in achieving a healthy mixture of the four humours of the body: blood, phlegm, bile, and black bile. See: D.P. Walker, "Ficino's *spiritus* and Music," *AM* 1 (1953), pp. 131-150.

that his newly developed system, which removes "the affrightening bug bear terms . . . [and reduces] . . . the confused cliffs into one established order . . .," should be adopted.[5]

In his second chapter, *The Gamut Reformed,* Salmon explained what he considered to be the principle obstacles that confront the music student. Chief among these was the Gamut (a graphic representation of the system of hexachords, first developed in the middle ages) which stands at the centre of modal theory instruction (see Example 1).

Example 1
The Gamut from: Thomas Salmon, *An Essay* . . ., p. 17.



[5]Salmon, *An Essay* . . ., p. 10.

Since the hexachords overlap, the same note could appear as la in one hexachord, mi in another, and re in a third. Hence, notes are designated by long and cumbersome names such as F fa ut and A la mi re. The use of these long compound names was thought necessary in order to accurately place each note in its precise location in the Gamut. To become fully conversant with basic music theory, students were required to memorize the entire Gamut backward and forward. For Salmon, however, the Gamut was "a long discourse of gibberish . . . a fardle of hard names and fictitious words . . . [that terrifies] the beginner . . . [and] is akin to conjuring."[6]

In place of the Gamut and its confusing collection of sol-fa syllables, Salmon believed, that one need know only seven notes, G, A, B, C, D, E, and F. Since all musical pitches recur at identical places at the octave, the long names were confusing and meaningless. As Salmon himself states, "An octave therefore being the same in all respects with its original note, like some beloved son, who is the pretty picture of his parent."[7]

In chapter three, "The Cliffs Reduced to One Universal Character", Salmon fully explains his system of notation. The inspiration for this was derived from John Wilkins's attempt to develop a universal language in his *Essay Towards a Real Character and a Philosophical Language* (1668). Salmon claimed that his new system of musical notation was created in order that all musicians would understand it immediately regardless of their instrument. Any work notated using his system would be instantly playable on any instrument or singable by any voice. "The Players, indeed, will find it but one, yet everyone's Native Language . . ."[8] In other words, Salmon's system would allow a musician who played the harpsichord to perform

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[6]Salmon, *An Essay . . .*, p. 11.
[7]Salmon, *An Essay . . .*, p. 12.
[8]Salmon, *An Essay . . .*, p. 28.

immediately music written for the lute—something which was previously extremely difficult unless the harpsichordist was completely fluent in lute tablature. In this respect his notational method was analogous to Wilkins's language, since:

> Like [Wilkins's universal language], which expressing things, and not words, is common to all countries; and may be read by those who agree not in speaking, neither at all, understand one anothers Discourse.[9]

With Salmon's system, the clef signs B, M, and Tr are placed on a staff to indicate the octave in which a note is located.[10] In effect, this results in the bass clef being used in all registers as the notes assigned to the various lines and spaces are those of this clef.

Salmon's problem with the traditional system of clefs resulted from the same line or space having a variety of notes assigned to it depending upon the clef.[11] This made it difficult to recognize an interval at sight and was exacerbated by the use of movable 'C' clefs which could be used to place 'C' on any line. Salmon furthers this point by providing a diagram (Example 2).

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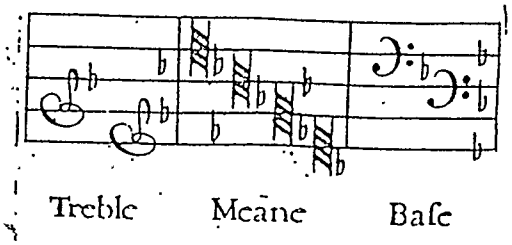
[9]Salmon, *An Essay . . .*, p. 29. Unlike Wilkins's universal language, which, if it were used, would require the memorization of a multitude of symbols, Salmon's notational system was extremely simple. For more on Wilkins and his language see James Knowlson, *Universal Language Schemes in England and France* (Toronto: University of Toronto Press, 1975), pp. 98-106.

[10]B = Bass, M = Mean, and Tr = Treble.

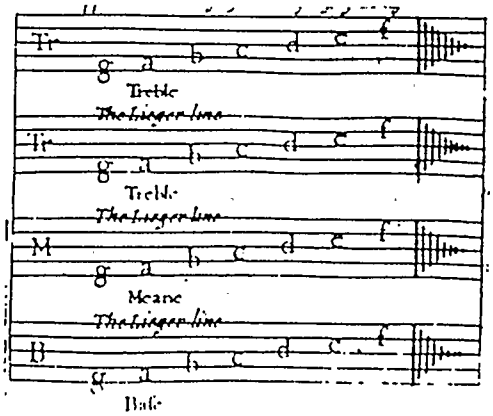
[11]Johannes Wolf in his *Handbuch der Notationskunde*, vol. 2 (Leipzig: Breitkopf und Härtel, 1919, pp. 339-340) provides examples of the great variety of clefs which were in use in the seventeenth century.

Example 2
From: Thomas Salmon, *An Essay . . .*, p.21



Salmon disposed of the old multiplicity of clefs and provided a system whereby a note, regardless of its octave, was always placed on the same space or line. Changes of octaves would be designated by the clef signs, Tr (Treble) M (Mean) and B (Bass) (see Example 3).

Example 3
From: Thomas Salmon, *An Essay . . .*, p. 23.



Salmon believed, that since the bass was the foundation of music, "all musick should conform itself to the writing of the bass . . .," hence his reason for adopting the bass clef in all registers.[12] By always placing the same note on the same space without regard for its octave Salmon hoped the students would learn to sight-read in less time and the "drudgery of musick", as he called it, would be reduced.[13] Furthermore, he commented:

> when once men find it will save them more than half the trouble, they will embrace it as readily as if I was the Emperor of the World to command . . . [For] Conveniency is the universal king.[14]

In the fourth chapter, "The Design Applyed: and First to Vocal Musick," Salmon demonstrates the advantages of his method. He considered the main benefits would be that transposition will no longer be necessary. With the traditional system, he notes, a violinist who normally reads treble clef has seemingly great difficulty in playing a piece written for viol in bass clef. A similar problem results for bass singers who try to sing parts written in treble clef.[15] Salmon was certain that his system, with its uniformity of design and "universal character" would alleviate the need to learn difficult transpositions and provide the musician with a "catholick knowledge of all instruments."[16]

Salmon continued his attack upon modal theory pedagogy by indicating that his system would make complex tables used to compute concords and discords, such as the one provided by Christopher Simpson in his *Compendium,* obsolete (see Example 4).[17]

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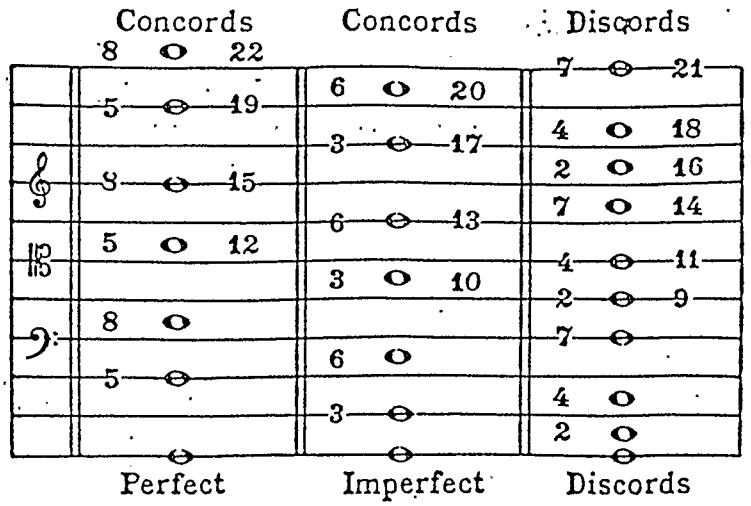
[12]Salmon, *An Essay* . . . , p. 46.
[13]Salmon, *An Essay* . . . , p. 26.
[14]Salmon, *An Essay* . . . , p. 26.
[15]Salmon, *An Essay* . . . , p. 28.
[16]Salmon, *An Essay* . . . , p. 30.
[17]Christopher Simpson, *A Compendium of Practical Musick* (London: William Godbid for Henry Brome, 1667), p. 21.

Example 4
From: Christopher Simpson, *A Compendium of Practical Musick* (London: William Godbid for Henry Brome, 1667), p. 21.

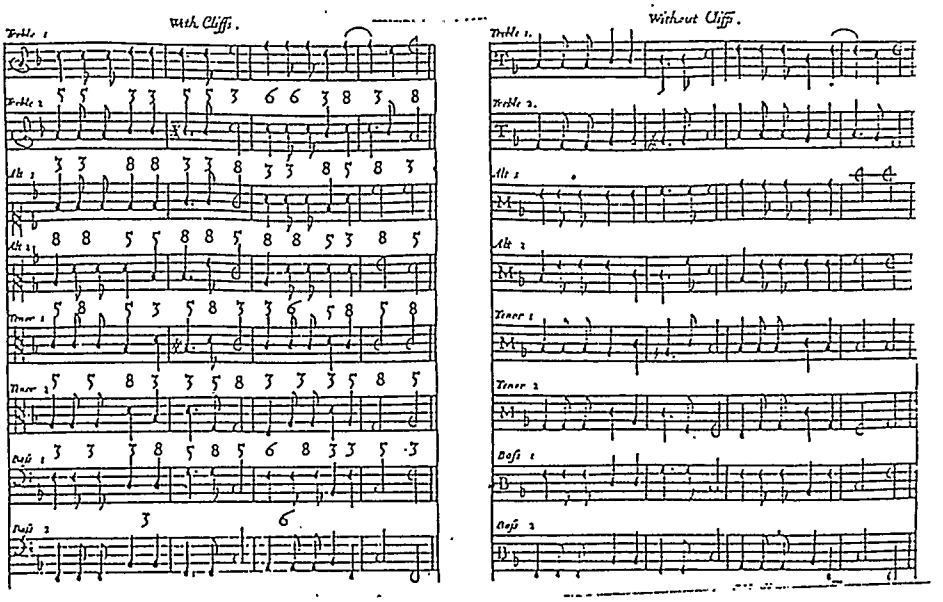


By using Salmon's method, composers would be able to perceive concords and discords at sight without first accounting for the effect of the different clefs. To prove this point, Salmon compares an eight-part choral work set in conventional notation with five different clefs, and the same work notated using his method (see Example 5).[18] Salmon explained the advantage of his system as follows:

> Tis needless to set the Figures where no cliffs are because the Concords are always situated in the same respective distance as if there were but one part. The Octave letters B M T only suppose a different Octave which also the cliffs (and more obscurely) do.[19]

[18]Salmon, *An Essay . . .*, p. 38.
[19]Salmon, *An Essay . . .*, p. 32.

Example 5
From: Thomas Salmon, *An Essay* . . ., p. 33.



In chapter five, Salmon turns his attention to instrumental music and discusses the benefits of his system. He concedes that, for some instruments, the advantage of his system may not be so obvious. Violin music, for example, is normally restricted to the treble clef, hence the violinist does not require a knowledge of more than one clef. Yet, for the sake of universality, he argues that music for the violin and other instruments like it should be notated with his method.[20]

The next instrument he discussed is the viol, which cannot, as he said "shrink itself to one clef . . .," hence the advantages of his system should be more obvious (see Example 6).[21]

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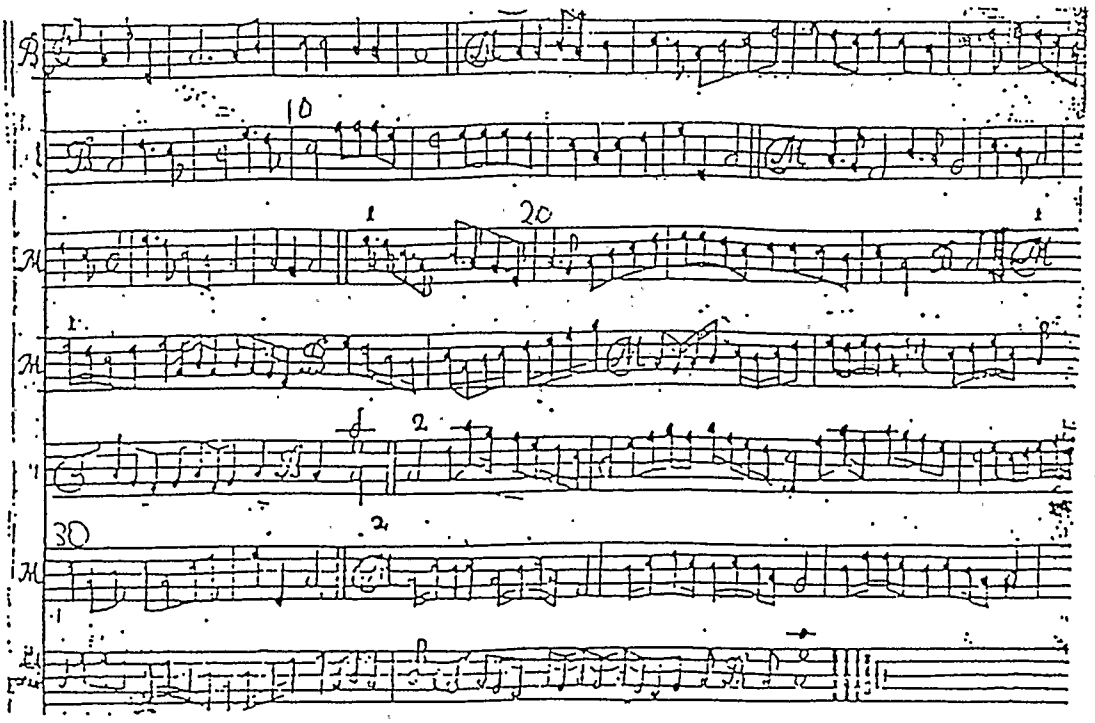
[20]At this point, Salmon acknowledged a familiarity with French Violin Clef. In essence, this clef system is identical to Salmon's treble clef in that the note 'G' is placed on the lowest line; see David Hiley, "Clef," *New Grove*, vol. 4, p. 476.

[21]Salmon, *An Essay* . . ., p. 43.

Example 6
From: Thomas Salmon, *An Essay . . .*, p. 49.



If this work were to be notated conventionally, its wide range would have required the use of two or more clef changes. Since with conventional clefs the lines and spaces of the staff do not retain a single note name regardless of the clef in use, the advantage of Salmon's system—where changes of clef symbol indicate only a change in the octave—is obvious. Yet Salmon's system is not flawless, as it is apparent that Salmon did not understand the value of having the notated musical line follow the rise and fall of the actual musical line. In several instances in Example 6 the smooth flow of the melodic line is interrupted by the change of octaves (see especially measures 24-28). This is a major drawback of Salmon's notational system.

After illustrating how his system might be employed with respect to viol music, Salmon digresses somewhat and discusses what he calls "the odd inconvenient situation of the notes upon the old viol tuning . . ."[22] This "old tuning", to which Salmon refers, is probably that described by Christopher Simpson in his *The Division-Violist* (1659). In this system, the open strings of the viol are assigned the following notes: D, G, c, e, a, d'.[23] Salmon recommends that the viol should be set to so-called *lyra* tuning in order that "the most frequent notes be always struck open, that their concords may be their nearest neighbours . . . and at last the whole viol, . . . may eccho forth a full consort-stroke . . ."[24] To accomplish this, Salmon recommends that the viol should be tuned to so-called *lyra* or Harp-way sharp tuning which results in the strings being tuned as follows: D, G, d, g, b, d'. Salmon recommends that the player should tune his instrument in this fashion consistently—

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[22]Salmon, *An Essay . . .*, p. 48.

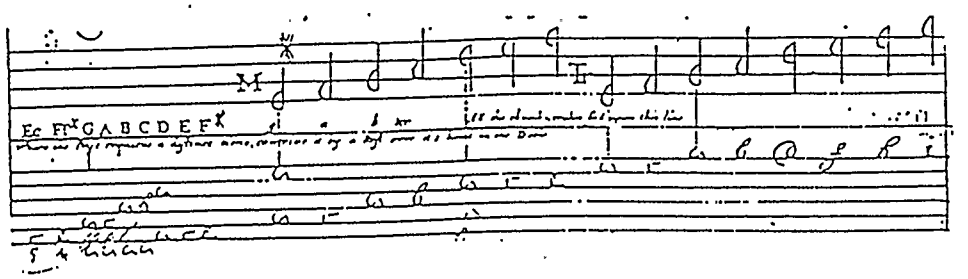
[23]This method of tuning the viol is also described by Praetorius and Mersenne. For Mersenne, this is the normal tuning for the viol (see Marin Mersenne, *Harmonie Universelle*[Paris, 1635; reprint, Trans. Roger E. Chapman, The Hague: Martinus Nijhoff, 1957], pp. 249-255.) Praetorius, however, describes eight different tunings for the viola da gamba (see Michael Praetorius, *Syntagma Musicum II: De Organographia* [Wolfenbüttel, 1619, reprint, Trans. David Z. Crookes, Oxford: Clarendon Press, 1986], pp. 39, 90-91).

[24]Salmon, *An Essay . . .*, p. 49.

altering it only when a piece requires "Harp-way flat" (i.e. D, G, d, g, b-flat, d').[25] Significantly, these two tunings result in a major and a minor chord respectively when the bow is drawn across the open strings. This suggests that Salmon was thinking in terms of major and minor keys.

Salmon's directions for tuning the lute also indicate that the modern concept of major and minor keys influenced him. Salmon recommended, as he did with the viol, that a single tuning be adopted for the lute (see Example 7).[26]

Example 7
From Thomas Salmon, *An Essay . . .*, p. 60.



Essentially, this tuning produces a G major chord when the strings are played open. Conventional tuning systems resulted in a series of open fourths and a third.

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[25]Salmon, *An Essay . . .*, p. 54. John Playford also describes two other manners of tuning the open strings; these he calls "High Harp-way sharp" and "High Harp-way flat" (See John Playford, *Musick's Recreation on the Viol, Lyra-way* [London: John Playford, 1652, reprint, ed.. N. Dolmetsch, London: Hinrichen Edition, Ltd., 1960], p. 3). A more detailed modern account of viol and lyra-viol tunings is contained in Jerome LeJeune's article "The Lyra-viol: An Instrument or a Technique?" *The Consort* 31 (1975), pp. 125-131.

[26]John Rogers (c. 1607-1676) was a lutenist in The King's Musick at the Restoration and was considered to be one of the most important English lutenists of the period (see Ian Spink, "Rogers, John," *New Grove*, vol. 17, p. 104).

Salmon was intent upon more than simply reforming the manner in which the lute was tuned. In Salmon's opinion, the lute held a special place among all instruments:

> The lute hath always had an undeniable sovereignty over other instrumental music, since that it itself is a compleat consort sounding with such a soft but powerful sweetness, as if it were well acquainted with all the intrigues of the mind; sometimes disarming anger and with its gentle breath cooling a revengeful rage.[27]

When he wrote of lute tablature, on the other hand, his tone changed considerably, describing it as "some private conjuring of a lutenist."[28] This was the main drawback of tablature notation—it was not universally and instantly understood by all musicians. Yet, Salmon argued, if lute music were notated in his system, then all musicians would understand it. The example Salmon provides of a lute work notated in his system is a rather simple dance-tune by John Rogers (c. 1607-1676) entitled "Arron's Gigue" (see Example 8).

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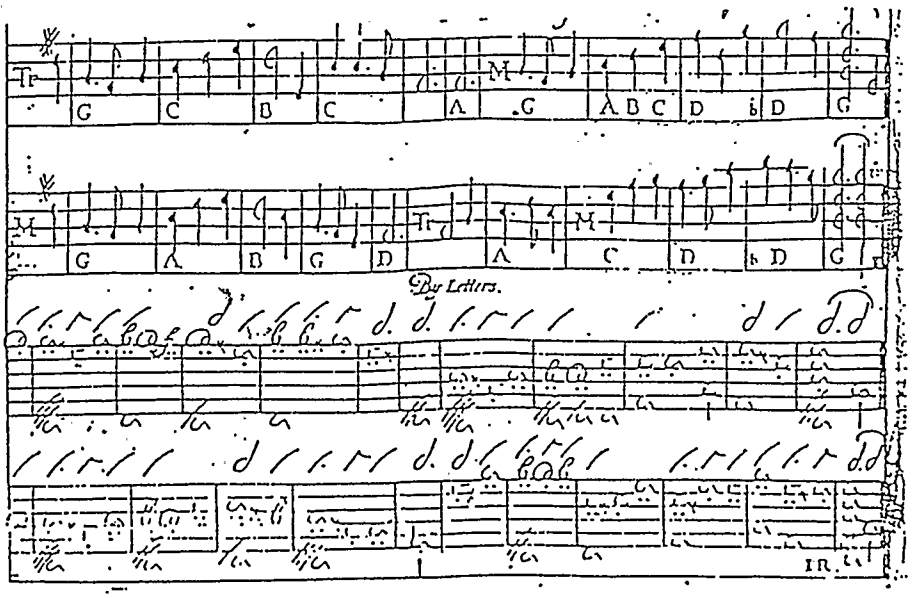
[27]Salmon, *An Essay* . . . , p. 60. Salmon's intense interest in and praise for the lute is not only in recognition of his admiration for the lute as a musical instrument, but also the result of the lute's link with science. Galileo, for example, used the lute in his experiments regarding falling bodies and acceleration. Francis Bacon mentions that he used the lute as an aid in attempting to observe how sound travels. It is likely that Salmon wished to restore the lute to its former prominent position because of its close connection with experimental science. The Royal Society was probably also aware of the importance of the lute in the activities of Galileo and Bacon. Any attempt at restoring the lute to a position of prominence, therefore, would have delighted the Royal Society. See Stillman Drake, "The Role of Music in Galileo's Experiments," *SA* 232 (January-June, 1975), pp. 98-104.

[28]Salmon, *An Essay* . . . , p. 66.

Example 8
From : Thomas Salmon, *An Essay . . .*, p. 60.



Salmon compensates for his system's inability to indicate where the harmony notes should be played by entering letters of the alphabet to mark their positions. Simple works, such as the one presented here, fit Salmon's system reasonably well; however, more complex, highly contrapuntal works for the lute could not be notated in this manner. Clearly, Salmon's knowledge of the existent lute literature was somewhat limited, for had he truly understood the intricate nature of most lute music, he surely would have understood the handicaps inherent in his system when it is applied to the lute.

Salmon's discussion of keyboard instruments begins with the following observation:

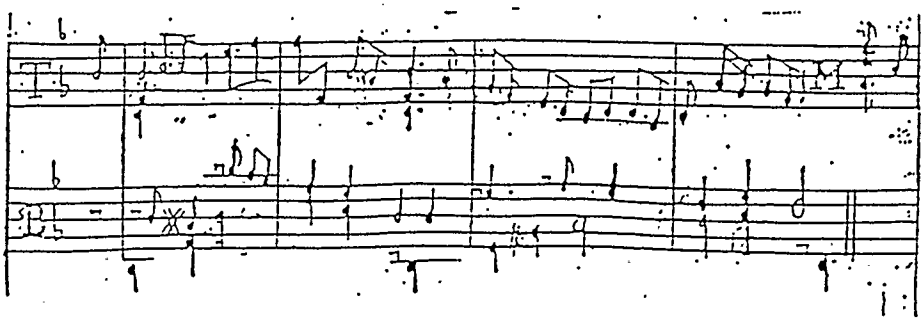
> In Holland [keyboard] tablature was invented for their women . . . who after lying in, or the like, were wont to forget all their

lessons and must begin anew.[29]

Salmon's low opinion of tablature is nowhere more apparent than in this passage. Yet blaming lazy Dutch women for the creation of keyboard tablature is rather peculiar, since keyboard tablature had been in use since the late-medieval period.[30] One might also assume, from this remark, that Salmon considered tablature notation to be easily understood— intended as it was, or so he said, for forgetful women. Obviously this is not the case, as he considered his system to be far simpler than tablature.

The practice of printing keyboard music in more than one clef also attracted Salmon's scorn. In order to quickly and easily understand multi-clef keyboard works, one would need "two [or more] heads, [otherwise] the terrible intricacy could cure ague . . ."[31] To further his case regarding keyboard music, he presents a short work for harpsichord, which is notated using his system (see Example 9).

Example 9
From: Thomas Salmon, *An Essay . . .*, p. 57.



[29]Salmon, *An Essay . . .*, p. 55.

[30]Willi Apel's *The Notation of Polyphonic Music 900-1600*, 5th ed.(Cambridge, Mass. The Medieval Academy of America, 1961) and Johannes Wolf's *Handbuch der Notationskunde* (Leipzig: Breitkopf und Härtel, 1919) both contain extensive discussions regarding keyboard tablatures in use in the late-Renaissance and early-Baroque period.

[31]Salmon, *An Essay . . .*, p. 55.

Although Salmon dispensed with the need to understand two different clefs (that is, two clefs in which the lines and spaces are not named uniformly) he has created some new problems. Salmon indicates large leaps in the melodic line, as in measure four of the example, by changing from one of his octave designating symbols to another. Hence, the fall of a major sixth in the right hand in measure four is accomplished through a clef change. As Example 9 and Example 6 clearly illustrate, it is apparent that Salmon did not understand the value of having the notated musical line follow the rise and fall of the actual musical line.

Anticipating that his proposed reforms might not be met with overwhelming approval, Salmon responded in his final chapter to a series of hypothetical objections to his system. Through his responses he summarized the advantages of his system as follows: (1) it would reduce the time required to master the art of music (2) it would lead to a deeper and more profound understanding of music, since all musicians would have an universal understanding of all music and instruments and (3) all people would then be able to partake in musical activities.

II. *Contemporary Criticism of Salmon's Notational System*

Although Matthew Locke's response to Salmon's proposal was vitriolic and viciously negative, he did demonstrate the inadequacies inherent in Salmon's system of notation. First, Locke illustrated that Salmon's notational method would require changes of clef whenever a melodic line extends beyond the confines of a single octave.[32] In effect, Salmon's system might actually require the use of more clefs in a composition and thereby complicate sight reading problems. Another point which Locke made is that a scale notated in the traditional method ascends regularly, giving the performer a clear indication of what he is to do. With Salmon's system the ascending scale breaks at the clef change and does not reflect graphically how the performer is to proceed .[33] Locke also asserted that the examples of lute and keyboard music Salmon chose were too simplistic and not representative of the repertoire of either instrument. According to Locke, Salmon's "way of writing [is] incapable of containing the parts of a well-composed lute [or harpsichord] lesson."[34]

Salmon was not silenced by Locke's criticisms and responded with a pamphlet entitled *A Vindication of an Essay to the Advancement of Musick* (London: A. Maxwell for John Carr, 1672). Far from conceding defeat to Locke, Salmon attempted to indicate that his system was grounded upon rational and scientific principles. The foundation of Salmon's proposal lay in his belief that the octave is the perfect consonance. The octave, which results from an "exact duple-proportion . . .

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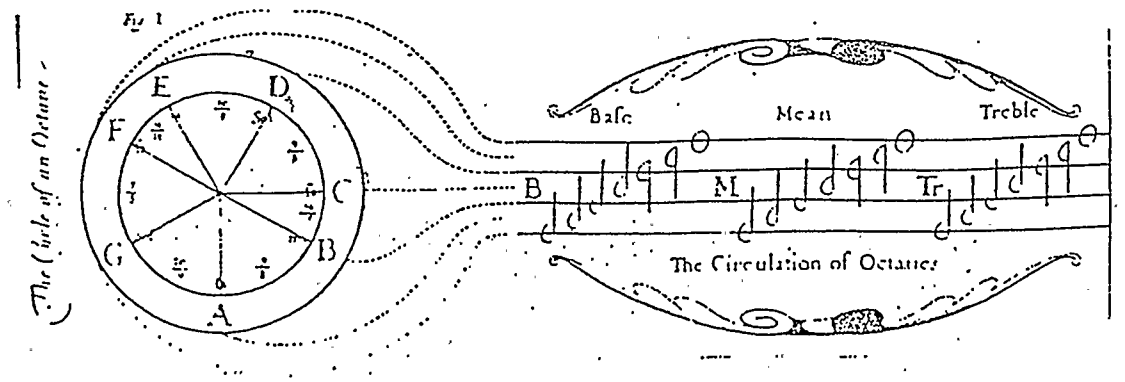
[32]Matthew Locke, *Observations Upon a Late Book Entituled, An Essay to the Advancement of Musick* (London: William Godbid for John Playford), p. 13

[33]Locke, *Observations . . .*, p. 13.

[34]Locke, *Observations . . .*, p. 37.

of incomparable good nature," is a compleat Cycle of Musick."[35] Salmon uses a diagram (see Example 10) to further illustrate his concept of a cycle of music based upon octaves and to prove that the octave is normally divided into seven steps.

Example 10
From: Thomas Salmon, *A Vindication . . .*, p. 43.



The system of hexachords and the sol-fa syllables associated with it causes "much confusion by directing men to follow that in practice which stands upon a very false foundation".[36] In essence, Salmon found the modal system, with its attendant nomenclature, not to be based upon scientific principles. Since notes recur at the octave, any scientifically valid system of music should illustrate this fundamental principle, as does Salmon's system.

Salmon summarized the foundation of his system with "The Five Propositions" presented below:

> I. *That Musick consists in Proportions, and is subject to Arithmetical Laws.*
> II. *That the first and most natural division of Musick is into Octaves, where the Notes and Half-Notes always circulate in the same order:*
> III. *That the Rudiments of learning Musick ought to be*

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[35]Salmon, *A Vindication of an Essay to the Advancement of Musick* (London: A. Maxwell for John Carr, 1672), pp. 10-11.

[36]Salmon, *A Vindication . . .*, p. 13.

> *agreeable to the nature of the Science. Wherefore we cast away those insignificant hard words of the Gam ut, which proceed according to Sixths and Fourths, only retaining the alphabetical letters for every octave.*
> IV.*That 'tis most easie, as well as most natural by one perpetual constancy, to place the Same Notes of every octave, in the Same lines and spaces, that the numerous variations of Cliffs may be avoided.*
> V. *That Since in this one Universal Character of Octaves, we may comprehend all parts of Musick, 'tis needless to engage in those difficulties which encrease our trouble, and confine our knowledge to a lesser compass.*[37]

Salmon did not accept Locke's criticism of his method and believed that since his system was grounded upon rational principles, it was therefore superior to the traditional methods. Salmon's response provoked Locke into publishing his *The Present Practice of Musick Vindicated* (1672). In this work Locke essentially summarized the points he had made earlier regarding Salmon's system.

Appended to Locke's *The Present Practice . . .* are the works of two other opponents of Salmon. The first of these is a singularly nasty commentary on Salmon and Locke's pamphlet war by John Milton's nephew John Phillips entitled *Duellum Musicum*.[38] The other response to Salmon was written by the publisher John Playford. It is at once more important and less mean spirited in its tone than those items which preceded it. Playford illustrates that Salmon's complaints against the use of C clefs are no longer valid, as he (Playford) publishes choral music using only two clefs, the treble and bass.[39]

> If you cast your Eye upon those several Collections of Ayres and Songs, which I have lately published, you will find I have not made use of the *C sol fa ut* Cliff in the second part of the *Musical Companion*, which consists of Songs of Two, three and Four Parts; but printed them all in the *G, or Treble Cliff* . . [40]

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[37]Salmon, *A Vindication . . .*, pp. 83-84.

[38]This item was discussed in Chapter Two.

[39]Matthew Locke, *The Present Practice of Musick Vindicated* (London: N. Brooke for John Playford, 1672), p. 86.

[40]Locke, *The Present Practice . . .*, p. 86.

It is possible that Salmon's simplified system of clefs influenced Playford in his decision to abandon C clefs in choral music, since Playford did not begin publishing choral music with only treble and bass clefs until after Salmon's *An Essay* . . . appeared.[41] Hence, Salmon was probably indirectly responsible for the practice in England of notating choral music with only the bass and treble clefs.

Although Salmon's proposals seem logical in many respects, they are not without serious problems. This is especially true in Salmon's discussion of lute tablature and lyra-viol tablature, where his limited knowledge of these instruments and their music is most apparent. Only the simplest works for these instruments could possibly be notated in his system. Other problems, such as the need to continually change clef signs in works with expanded ranges, were also not fully addressed by Salmon. His proposed abolition of solfa syllables is also questionable, and suggests that he did not grasp their usefulness as pedagogical aids. For the amateur musicians of the day, however, Salmon's simplified system might have been useful, as they would certainly have found his method much easier to grasp than the one in use at the time. Of course, this would have required that all composers and music publishers adopt his system—something which was highly unlikely.

In the overall context of music theory in England during the seventeenth century, Salmon's proposed reforms of musical practice represent but one attempt to alter musical theory to conform to practice.[42] English theorists were in the vanguard in this respect as they were among the first to recognize the inadequacies of Renaissance theory when it came to understanding and notating more tonally-oriented compositional procedures.

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[41]Lillian M. Ruff, "Thomas Salmon's *An Essay to the Advancement of Musick*," *The Consort* 21 (1964), pp. 266-275

[42]Gardner Read, *Source Book of Proposed Music Notation Reforms* (New York: Greenwood Press, 1987).

Unlike the treatises of Campion, Coperario and various others, Salmon's treatise does not deal with the mechanics of composition and therefore is not concerned with the formation of chords or scales as such. His recommendations for lute and viol tuning do seem to indicate, however, that he was thinking in terms of major and minor keys. Salmon recognized that a problem lay with the systems of notation and the nomenclature associated with traditional modal theory. Tablature notation and movable clefs, two elements of the traditional system system which Salmon considered detrimental to his goal of standardizing notation for all instruments, were to be swept aside.

III. *A Proposal to Perform Musick in Perfect and Mathematical Proportions*

During the sixteenth and seventeenth centuries numerous individuals attempted to recapture the miraculous moral effects of music described by ancient authors. These individuals did not, however, approach their ultimate goal by the same path. For some, such as Jean-Antoine de Baïf (1532-1589) and other members of his *Académie de Poésie et de Musique*, the key to resuscitating the power of music lay in following strict rules of text setting, an attitude that led to the creation of *musique mesurée*.[43] Others, such as Giovanni Battista Doni (1595-1647), believed that the source of the power of music lay in the use of the ancient Greek *tonoi* or modes. Girolamo Mei (1519-1594), Vincenzo Galilei (ca. 1520-1591), and Giovanni de Bardi (1534-1612) had discovered that the ancient Greek modal system was quite different from the system of church modes.[44] Doni, realizing that contemporary instruments were incapable of performing music conceived within the context of the ancient Greek system, developed new instruments, such as his *Lyra Barberina,* which he hoped to use in the performance of music based upon ancient musical practices.[45]

In his *A Proposal to Perform Musick in Perfect and Mathematical Proportions* (1688), Thomas Salmon followed earlier musical humanists by claiming that he had invented a method by which the power of music to affect the Soul would be enhanced, since the "Soul is from Heaven inform'd to judge of [music], and the body in Unison with it, must submit to [the power of the music]."[46] Like Doni before him,

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[43]D.P. Walker, "Musical Humanism in the Sixteenth and Early Seventeenth Centuries," *MR* 2 (1941), pp. 6-8.

[44]Claude V. Palisca, *Humanism in Italian Renaissance Musical Thought* (New Haven, Conn.: Yale University Press, 1985), pp. 280-332.

[45]Claude V. Palisca, "G.B. Doni, Musicological Activist, and His *Lyra Barberina*" *Modern Musical Scholarship,* ed. Edward Olleson (London: Oriel Press, 1980), p 181.

[46]Thomas Salmon, *A Proposal to Perform Musick in Perfect and Mathematical Proportions* (London: John Lawrence, 1688), p. 3.

the heart of Salmon's proposal involved the modification of modern instruments. But where Doni developed complex instruments which were capable of both performing quarter tones and of moving freely from one ancient modal species to another, Salmon sought only to modify a single existing instrument—the viol—in order that just tuning could be incorporated into its design. For Salmon the ultimate source of the miraculous power of music resided in the use of instruments which were tuned in a fashion that he believed emulated the tuning used by the ancient Greeks.

Salmon was not alone in holding musical humanist beliefs in late seventeenth-century England. Robert Hooke and William Brouncker, among other prominent members of the Royal Society, also maintained similar views.[47] Many members also actively studied ancient Greek music theory. Salmon is unique, however, in that he was virtually alone in actually devising a practical system through which he hoped to reinstate the power of music. Although primarily concerned with illustrating how the viol might be modified to incorporate just intonation in its design, this work is also significant because of Salmon's reference to the concept of relative major and minor keys—a cornerstone of the modern tonal system. These references predate Rameau's full acceptance and explanation of the major/minor system by forty years.[48] In his anticipation of future advances in music theory Salmon clearly follows the path taken by previous generations of English music theorists.

A Proposal . . . is divided into the following main sections: *The Epistle Dedicatory, Of the state of Musick in general, The Principles of Present Practice, and The Tables of Proportions calculated for the viol and capable of being Accommodated*

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[47]See Chapters one and two.

[48]Rameau explained this concept in his *Génération Harmonique* of 1737 (see Matthew Shirlaw, *The Theory of Harmony* [London: Novello, 1917], pp. 229-230). Salmon also antedates the German theorist Johann David Heinichen's acknowledgement of this principle in his *Neue erfundene und grünliche Answeisung . . . des Generalbass* of 1710 (see Joel Lester, *Between Modes and Keys: German Theory 1592-1802* [Stuyvesant, N.Y.: Pendragon Press, 1989], pp. 106-107).

to all sorts of Musick.

In the *Epistle Dedicatory*, addressed to Sir John Cutts, a senior officer in the English Army, Salmon outlined the purpose of this publication. He asserted that he had provided the reader with "the Anatomy of Musick . . . [in which he has proven that] . . . all the best proportions are the best chords of Musick, and strike the Ear with a pleasure agreeable to the dignity of their Numbers." [49] In other words, the effects of music are enhanced when one uses precise mathematical proportions to tune instruments. According to Salmon, the use of tempered intervals—intervals which cannot be expressed as simple ratios—significantly reduced music's power to influence human emotions.

In his first chapter (*Of the Present State of Musick*), Salmon acknowledged his debt to the work of his predecessors and contemporaries, whose "great Diligence in Searching after Antiquity" had restored much of the learning of classical times.[50] One individual whose diligence in translating and disseminating the work of the ancient authors directly affected Salmon's work was his old acquaintance, the Oxford mathematician and fellow of the Royal Society, John Wallis.

Wallis's publication of a Latin translation and commentary upon Claudius Ptolemy's *Harmonics* in 1682 inspired Salmon to examine Greek theories of tuning.[51] This is not to suggest that Salmon was limited to the writings of Ptolemy in his knowledge of ancient Greek authors; through his study of Boethius at university he also knew the writings of the Pythagoreans on music. It was, nonetheless, to Ptolemy that Salmon believed he owed the greatest debt in his present work.[52]

Early music theorists, such as Ptolemy, who followed Pythagorean principles

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[49]Salmon, *A Proposal . . .*, pp. [v-vi].
[50]Salmon, *A Proposal . . .*, p. 2.
[51]John Wallis, *Claudii Ptolemaei harmonicum libri tres* (Oxford, 1682).
[52]Salmon, *A Proposal . . .*, p. 2.

with respect to the tuning of intervals, believed that the best musical intervals resulted only when simple superparticular numerical ratios were employed.[53] In effect, their study of harmonic principles arose from their conviction that the universe was orderly, and "that the perfection of the human soul depends on its grasping, and assimilating itself to that order."[54] Since fundamental musical intervals can be expressed as simple and elegant formulae (i.e. the octave has the ratio 2 : 1, the fifth 3 : 2), they maintained that all proper and correct harmonic intervals gain their status through their mathematical properties.[55] Essentially, the Pythagoreans believed,

> The order found in music is a mathematical order; the principles of the coherence of a coordinated harmonic system are mathematical principles. And since these are principles that generate a perceptibly beautiful and satisfying system of organization, perhaps it is these same mathematical relations, or some extension of them, that underlie the admirable order of the cosmos, and the order to which the human soul can aspire.[56]

To prove that simple mathematical patterns are the basis of beauty in music was also Salmon's desire and was the fountainhead of his belief that "the more exact the Proportions, the more excellent the Musick."[57] Nevertheless, Salmon allowed that music that was not composed using precise mathematical proportions is also beautiful and effective. Modern musicians, he asserted, have exceeded the ancients in many respects:

> There never was such regularity in the designing of keys, such a pleasing sweetness of air, such a various contexturing of chords, as the practical musicians are at this day Masters of.[58]

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[53]Superparticular ratios are those which can be expressed mathematically as (n + 1) : n. The primary interval, the octave, is considered to be superparticular because it is expressed by the ratio 2 : 1.

[54]Andrew Barker, *Greek Musical Writings*, vol.. 2 (Cambridge: Cambridge University Press, 1989), p. 6.

[55]Barker, *Greek Musical Writings*, p. 6.

[56]Barker, *Greek Musical Writings*, p. 6.

[57]Salmon, *A Proposal . . .*, p. 3.

[58]Salmon, *A Proposal . . .*, p. 3. This position is distinct from that of Isaac Voss, a

But the effectiveness of modern music could be greatly enhanced if "so many unproportionate imperfections" were cast off in favour of music based on pure, simple ratios.[59] In other words, by tempering the scale, as had been common practice since the late middle ages, musicians had debased music and reduced it to the level of a mere sensual entertainment.[60] The ears of musicians had been "debaucht with bearings and imperfections . . ." that resulted from accepting the impure intervals of the tempered scale.[61] Yet, if pure intonation were coupled with modern practice the result would be music of tremendous power and beauty.

Salmon's second chapter opens with a reminder that all musical intervals are the result of mathematical proportions and that all of these intervals must be placed in the correct order so that "the greater Intervals (compounded of them) may in the best proportions possible arise out of them. . ."[62] The smallest intervals, or what Salmon referred to as the "gradual notes," are the major and minor second.[63] The size of the seconds is important with respect to the tuning of larger intervals, and their position within the span of an octave is critical in determining the quality of scale, i.e. whether a scale is sharp or flat, to use Salmon's terminology, or in more modern terms, major or natural minor. Modern composers, Salmon contended, unlike their ancient predecessors who had a multitude of different scale types, restrict themselves in their

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contemporary of Salmon, who argued in his *De poematum Cantu* (1672) that the music of the ancients was in fact superior to that of the moderns. See Gouk, "Music in the Natural Philosophy . . .," p. 227.

[59]Salmon, *A Proposal . . .*, p. 5.

[60]The scale was tempered in order that no one interval would be so out of tune as to be distasteful.. This necessitated tuning some intervals slightly differently than they would be in their pure form. In equal temperament (i.e. dividing the octave into twelve equal semitones), forms of which were used with fretted instruments such as the viol and lute since the late medieval period, fourths, fifths, thirds and sixths were adjusted in order to avoid foul sounding dissonances. See J. Murray Barbour, *Tuning and Temperament* (East Lansing, Mich.: Michigan State College Press, 1953), pp. 45-55.

[61]Salmon, *A Proposal . . .*, p. 5.

[62]Salmon, *A Proposal . . .*, p. 5.

[63]Salmon, *A Proposal . . .*, p. 6.

compositions to these two scale types.

> There needs then only this twofold constitution of the octave to be considered by us, the two Keys A and C: all the rest serve only to render the same series of Notes in different pitches.[64]

Unlike their ancient Greek forebears, modern composers did not compose in the three musical *genera* of the ancient Greeks. In simple terms, Salmon believed that modern musicians did not compose quarter-tone or chromatic music and instead restricted themselves to an equivalent of the third ancient *genus*, diatonic music.[65] Rather than trying to revive in its entirety the ancient musical system, as Doni and others attempted, Salmon would rather modify existing practice in the simplest possible manner. Since he believed correctly that Greek diatonic music with its combination of whole tones and half tones, was roughly equivalent to modern practice, it should therefore serve as the basis for any restructuring of music.

In his *Harmonics*, Ptolemy described five possible tunings for diatonic music which he had derived from the work of earlier theorists.[66] All of these tunings adhere strictly to the principle of superparticularity, yet only one of these tunings, the tense diatonic or syntonic diatonic, produces pure thirds together with pure fourths and fifths—the hallmark of just intonation.[67] A major scale constructed using this tuning would have the proportions 10:9, 9:8, 16:15, 9:8, 10:9, 9:8, 16:15.[68] Unsurprisingly, then, Salmon sets forth the proportions for the keys of A minor and C major as follows:

A minor: A.9 :8 B.16:15 C.10:9 D. 9:8 E.16:15 F.9:8 G.10:9 A.

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[64]Salmon, *A Proposal . . .*, p. 8.
[65]Salmon, *A Proposal . . .*, p. 15.
[66]Barker, *Greek Musical Writings*, p. 350.
[67]Barker, *Greek Musical Writings*, p. 350.
[68]The two different varieties of whole tones 9 : 8 and 10 : 9 are separated by the syntonic comma, a ratio of 81 : 80. This is the source of the name for this tuning.

C major: C.10:9 D.9:8 E.16:15 F.9:8 G.10:9A.9:8 B.16:15 C.[69]

In his commentary upon Salmon's treatise, John Wallis recommended that Salmon should have adopted a slightly different tuning.[70] In essence, Wallis believed that Salmon should adopt Didymus's diatonic tuning. The difference between the two tunings lies solely in the placement of the major and minor whole tones (major whole tones are set in the proportion 9:8 while minor whole tones have the proportion 10:9).

Salmon was not unaware of the problems this tuning system presents and he listed a set of unusable, or as he describes them, "Inconcinnuous Intervals".[71] In effect, the following intervals must be avoided in the keys of C major and A minor as they will be significantly out of tune: (1) The minor third from B to D, (2) The fourth from D to G, and (3) The fifth from G to D.[72] Salmon informs the reader that these intervals must be avoided, but their avoidance is not, he argues, the result of defects in his tuning system. Rather, the laws of nature require that certain intervals not be used:

> Scholares are not to alter nature, but to discover her Constitutions, and to give opportunity for the best management of all her Intrigues . . . I am sure nature desires it [just tuning], and will rejoyce in those Proportions, which by the Laws of Creation she is to be delighted with.[73]

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[69]In his listing of the intervallic proportions, Salmon provides only the numerator of the proportions (Salmon, *A Proposal . . .*, p. 20). Although Salmon does not use the terms major and minor, they are used here to avoid confusion. Salmon describes C major as the key of C and A minor as the key of A. In fact, the first recorded usage of the terms minor and major to describe different scale types is found in Andreas Werckmeister's *Musicae mathematicae* of 1687; see Joel Lester, *Between Modes and Keys: German Theory 1592-1802* (Stuyvesant, N.Y.: Pendragon Press, 1989), p. 89.

[70]John Wallis, "Remarks on the Proposal to Perform Musick in Perfect and Mathematical Proportions," appended to Thomas Salmon, *A Proposal . . .*, p. 37. According to Penelope Gouk, the reverse is the case (Gouk, "Music in the Natural Philosophy . . ., p. 227). Gouk, however, appears to be in error in this regard as the correct proportions for Ptolemy's tense diatonic tuning are those given by Salmon, not Wallis (see Andrew Barker, *Greek Musical Writings . . .*, p. 350).

[71]Salmon, *A Proposal . . .*, p. 24.

[72]These intervals would have ratios as follows: the minor third, B to D, 32/27, the fourth, D to G, 27/25, and the fifth G to D, 27/40.

[73]Salmon, *A Proposal . . .*, p. 24-25.

In the final chapter (*An Account of the Tables of Proportions)* Salmon described how a viol should be constructed in order that the advantages of just tuning may be manifest. Salmon believed that this could only be accomplished by providing each string with a separate set of frets, since the regular system of placing the frets was incompatible with just intonation. By setting the frets in this fashion, however, the violist would be severely restricted with respect to the keys in which he could perform. The unequal wholetones of just intonation prevent freedom of movement from one key to another. To compensate for this difficulty, Salmon proposed that each key should have its own particular fingerboard and that to change keys, the player should simply exchange one fingerboard for another.[74]

Salmon, reflecting upon contemporary practice in England, stated that modern composers make use of fourteen different keys, seven of which are sharp, corresponding to the modern major, and seven of which are flat, corresponding to the modern natural minor.[75] Yet, as Salmon himself states, "for these fourteen keys you need to have only seven fingerboards; for when the proportions are lodged between the same letters then there will be no shifting . . ."[76] Since the same proportions for the intervals are used in the keys of C (major) and A (minor), the same fingerboard can also be employed. In effect, as a consequence of his attempt to incorporate just tuning into modern practice, Salmon fell upon the concept of relative major and minor

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[74]In this regard Salmon believed he was following the practices of the ancient Greeks as his comments in a letter to John Wallis in late 1685 indicate: "I am of the opinion, when the Ancients plaid upon different keys or modes they had different pipes and instruments, if this were true, in them, or however if wee do it, every note shall be rendered in the utmost perfection." (Thomas Salmon, letter to John Wallis, December 31, 1685, Obl Ms. Eng. Let. C.130, fol. 27). John Wallis, replying to this letter, recommended a simpler solution in which the frets alone would be movable Salmon, however, retained his original notion of interchangeable fingerboards (John Wallis, letter to Thomas Salmon, January 7, 1685/6, Obl Ms. Eng. Let. C130, fol. 28).

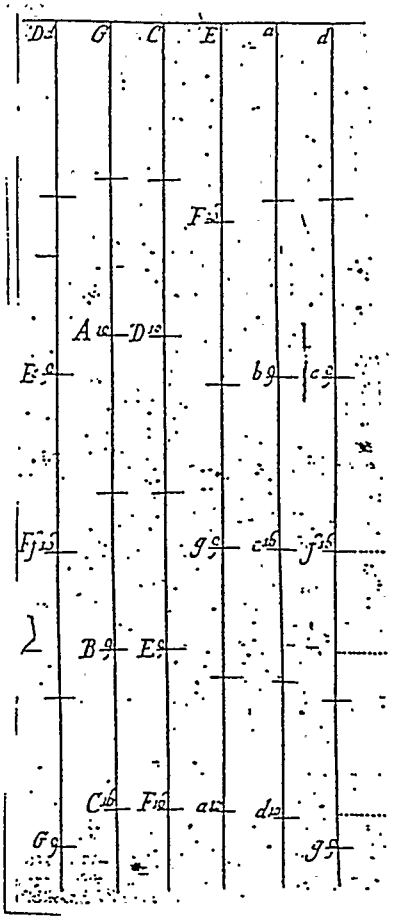
[75]Christopher Simpson also listed the same fourteen useable keys in his *A Compendium of Practical Music* (London: William Godbid for Henry Brome, 1667), pp. 5-6

[76]Salmon, *A Proposal . . .*, p. 19.

keys.[77]

The treatise concludes with seven diagrams (one for each set of paired keys), each of which serves as a rough guide in assisting the instrument maker in the correct placement of the frets (see Example 11).[78] Example 11 is a diagram for a viol fretboard tuned for the keys of C major and A minor. Frets (indicated by slashes and note names) are placed at different locations on all six strings in order to accommodate the unequal seconds of just intonation.

Example 11
From: Thomas Salmon, *A Proposal . . .*, p. 29.



[77]He also pairs F major and D minor, B-flat major and G minor, E-flat major and C minor, G major and E minor, D major and B minor, and A major and F-sharp minor.

[78]Salmon, *A Proposal . . .* , p. 25. Salmon's diagrams are not exactly to scale.

Unlike Salmon's first foray into music, which led to a war of letters, his proposed reforms of intonation were greeted in a more subdued fashion and actually found some converts. In 1705, some seventeen years after he first proposed the creation of a viol capable of performing in just intonation, Salmon demonstrated such an instrument before the Royal Society.[79]

In conclusion, Salmon's *A Proposal . . .* represents an attempt to recapture the fabled power of music. Salmon believed that the secret of this power resided in the manner by which instruments were tuned. Like Doni and other Italian and French musical humanists before him, Salmon concentrated his efforts on developing an instrument which could perform music as he believed the ancient Greek instruments performed music. His solution—placing the frets on the viol fingerboard in order that the instrument could be performed in just intonation—placed severe limitations on the instrument. For Salmon, however, the limitations were acceptable, since he believed that the inherent value of just intonation would compensate for any restrictions placed upon musicians. In order to compensate partially for these limitations, however, Salmon proposed that the viol be equipped with a different fingerboard for each pair of relative major and minor keys. Hence, as a result of his desire to recapture the music of antiquity he stumbled upon one of the cornerstones of the yet to be codified tonal system.

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[79]Thomas Salmon. "The Theory of Musick Reduced to Arithmetical and Geometrical Proportions" *PTRSL* 302 (1705), irregular pagination.

CHAPTER FOUR: CONCLUSION

W. T. Atcherson described seventeenth-century English music theory as exhibiting two orientations, "the one practical and pervading the entire century, the other more purely theoretical and becoming prominent only in the second half of the century."[1] Atcherson classified the works of Thomas Salmon as being of the "more purely theoretical type."[2] Yet, it is probably more accurate to view Salmon as a music theorist whose works exhibit both a practical and theoretical—or speculative—orientation. In fact, it may be more accurate to describe Salmon as a speculative musician who sought reforms of practical music.

The dual orientation of Salmon's approach to music is best exhibited in his first work, *An Essay to the Advancement of Musick.* Salmon attempted to simplify purely practical aspects of music for the amateur musician (i.e., pedagogical methods and notational procedures) in order to promote a broader dissemination of musical knowledge. Although it is clear that Salmon was influenced by non-musical factors in his proposal for reform—especially the philosophical concepts of Pansophism as manifested in John Wilkins's scheme for a universal language—he did not deviate significantly from the path taken by most English theorists of the seventeenth-century.

The vast majority of English theorists produced works which were little more than instruction manuals in composition for the amateur musican. In order to address the needs of amateurs, English theorists—beginning with William Bathe in the late sixteenth century—attempted to simplify theoretical concepts in order that they might be more readily grasped by the dilletante. This need to simplify music theory may

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[1]W.T. Atcherson, "Symposium on Seventeenth-Century Music Theory: England," *JMT* 16 (1972), p. 7.

[2]Atcherson, "Symposium . . .," p. 6.

have acted as the impetus behind the early acceptance of tonal compositional procedures by English theorists.[3] Salmon sought to simplify music theory for the amateur, and like his predecessors, Salmon centred his reforms on the abandonment of the remnants of modal theory—the Gamut, solmization, movable 'C' clefs, and tablature notation.

Simplifying music theory for the amateur was not Salmon's only concern. His main criticism of contemporary music theory and notational practices grew from his belief that it did not reflect basic scientific principles. For Salmon, the interval of the octave was of paramount importance. Notes recur invariably at the octave, and any rational musical system, he maintained, must reflect this phenomenon. The modal system with its reliance on the Gamut, hexachords, multiple clefs, and principles of solmization, did not. The system was fundamentally flawed, Salmon believed, because it was unscientific. The influence of Francis Bacon's philosophical tenets on Salmon's thinking in this regard is obvious. But the most profound influence upon Salmon in this respect was exercised by Salmon's music master John Birchensha, who was developing his own schemes for a new and scientific musico-theoretical system. Birchensha considered contemporary music theory to be intensly problematic and inherently unscientific. His zealousness undoubtedly infected Salmon and inspired him to develop his notational system.

Salmon's notational reforms did not succeed, however, for several reasons. First, the reforms were too radical for conservative musicians such as Matthew Locke. Salmon—really no more than a dilletante himself—could not possibly convince powerful, established, professional musicians that he had invented a less complicated musical system. Secondly, although Salmon's method was not as ineptly

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[3]Atcherson, "Symposium . . .," p. 12.

conceived as Locke maintained, it was not flawless. It was not suited for use in notating complex contrapuntal works for keyboard instruments or the lute. Thirdly, the movable 'C' clefs, against which Salmon railed, were already being supplanted, as music publisher John Playford informed Salmon, by the modern notational system in which only treble and bass clef are used.[4] Salmon's ideas of reform may have influenced Playford's decision to use only these two clefs in his publications, but Playford's solution was found to be much more acceptable than Salmon's.

Salmon's second major work on a musical topic, *A Proposal to Perform Musick in Perfect and Mathematical Proportions,* cannot be strictly categorized as belonging to the more speculative side of music theory. Certainly Salmon's stated aim in this work, that of recapturing the wondrous effects attributed to music by the ancient Greeks, is a concept more typically associated with speculative music theorists, but Salmon's approach to this subject is decidedly practical. He sought a rapprochement between practical and speculative musicians. Hence, he directed his efforts at redesigning an instrument, the viol, in order that it might be performed upon in just intonation—the key, in Salmon's opinion, to the fabled power of music. Unlike some other English musical humanists, who only expressed a belief in the power of music and did not actively seek its source, Salmon was more akin to his continental predecessors, such as G.B. Doni, in that he wished to develop an instrument for use by practical musicians. Salmon hoped that practical musicians would recognize the value of his redesigned viol and modify their practices to accommodate it.

Like his notational system, Salmon's just intonation viol was too idealistic and too limited in its application to attract much interest from most musicians. The

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[4]Locke, *The Present Practice . . .*, p. 86.

instrument was confined to performing harmonically simple works in a single pair of major and minor keys. In order to compensate for this shortcoming, Salmon struck upon the idea of removeable fretboards; each pair of relative major and minor keys would have its own fretboard. But this is not a truly satisfactory solution. It seems improbable that a violist could change his fretboard while continuing to perform a piece that happened to modulate. Irrespective of this fact, just intonation imposes restrictions upon a composer even in the context of a single key. Since these restrictions were the product of natural acoustical properties, and since Salmon believed musicians would be entranced by this 'improved' music, these deficiencies were of little concern to him. The support for his just intonation scheme which he received from members of the Royal Society was ample reward for Salmon.

That Salmon should receive support from the Royal Society is unsurprising. Various members of the Society, such as Robert Hooke and William Brouncker were firm believers in the ancient power of music. Others, such as Salmon's mentor John Wallis, translated ancient works on music and other topics. In fact, it has been stated that the revival of interest in the writings of classical authors in England did not begin in earnest until the late seventeenth century.[5] Hence, Salmon's work is clearly part of the *Zeitgeist* of late seventeenth-century England.

From the perspective of the gradual evolution of tonal principles in the seventeenth century, Salmon's *A Proposal. . .* is also significant. He stumbled upon the concept of relative major and minor keys more than thirty years before this tenet of tonal theory was codified and explained by Rameau. Therefore, as his first treatise foreshadowed the enventual abandonment of the paraphernalia of the modal era, his second foreshadowed the acceptance of a fundamental principle of the tonal era.

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[5]Dean Tolle Mace, "Musical Humanism, the Doctrine of Rhythmus and the Saint Cecilia Odes of Dryden," *JWCI* 27 (1964), p. 251.

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