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MUSICAL STRUCTURE
IN THE WORKS OF TURLOUGH O'CAROLAN

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METHODOLOGY

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PURPOSE

The music of Irish composer Turlough O'Carolan (1670-1738) is widely performed today by musicians interested in folk music and by performers of the steel-strung Irish harp. These tunes are actually the work of a very sophisticated musical thinker who was in touch with the popular masters of his day. For example, It has been generally shown that Italian composers Francesco Geminiani (1687-1762) and Arcangelo Corelli (1653-1713) were influential in his work.

A comprehensive catalog that demonstrates the forms and thematic devices used by Carolan could be used to explore these questions in greater detail. A catalog of this type will be developed here. Some of the questions concerning the connections of Carolan to the main stream musical thinking of his day will be mentioned.

LITERATURE REVIEW

IMPORTANCE OF RESEARCH:

There are several writings devoted to influences on Turlough O'Carolan, but few show this influence with great detail. Of those that do, they show a small number of examples, and could be missing many different inter-relationships. A catalogue detailing Carolan's themes and forms could help show influences, in detail, in a single reference.

SCOPE:

This review covers various writings on Carolan from 1786 to 1996. It looks at aspects of his

historical background that might have had an influence on his musical perception, and explores previous examples of his musical structure.

PREVIOUS FINDINGS:

How it has been studied:

For the most part, the authors to be discussed have found their material in primary sources (manuscripts or music notation, books, and letters).

What has been found:

About Carolan:

The so-called complete collection of Carolan's compositions (Ossian) includes 214 tunes, and where they were found. This gives us easy access to Carolan's tunes (in one book) for comparison, as well as other sources if needed. (Ossian, 148-150)

O'Neill's book discussed the history of the bard and Irish music. (O'Neill, 265-320) This gives us insight into how Carolan thought, and how he might have perceived Italian music. His book also includes a section that shows how time has varied several Irish tunes, which is important to the folk tradition from which Carolan came. (O'Neill, 338-343) When looking at Carolan's tunes, it is important to remember that transcribers and editors have made alterations, accidental and intentional.

Rensch mentions Edward Bunting's discovery of "one uniform system" of tuning with harpers from various regions of Ireland. (Rensch, 110) This also gives us insight into Carolan's thinking, and possible limitations to his compositions. Known limitations help to identify changes by editors.

At one point, Fox mentions Carolan's "fertility of invention". It is implied that this may be not just because he was creative, but that this was how he made his living. (Fox, 119) This is

important because it shows one aspect in which Carolan and other composers thought alike. Whether it was patronage or the public, each had an audience that was to be supplied with musical entertainment. In order to survive, they had to write and perform what their audience liked.

The second volume of O'Sullivan's work includes a catalogue of 213 of Carolan's tunes. This catalogue does not discuss the musical techniques of Carolan, but rather the history of each of these tunes. He assigns each tune a number, and gives his source for the tune. He then explains when and why the tune was written. (O'Sullivan, 5-137) This gives us the location of Carolan at certain times in his life. His location is relevant because it would influence the style of his music as the audience changed, as well as showing a possible proximity to Italian composers.

Yeats discusses the bass line of Carolan's music, both rhythmically and melodically. She also includes examples of this bass. (Yeats, 19) This is important because there are only 24 tunes with "original" basses in her discussion, the others being lost or never recorded. (Yeats, 15-16, 18-19) With so few basses available, it is difficult, if not impossible, to know Carolan's accompaniment for analysis. To be aware of his tendencies is helpful. She also points out that the resonance of the wire strung Irish harp creates many interesting harmonic possibilities, alluding that there may have been a certain amount of improvisation with the bass line. (Yeats, 16)

Rimmer, in "Harp Repertoire...", looks at three of Carolan's pieces in detail. She identifies several melodic and metric patterns, and differentiates melody from accompaniment. (Rimmer - 1994, 77, 82, 84) This is significant in that it gives a more detailed analysis than most. It can also serve as a guide when comparing Carolan to Italian Composers.

In Rimmer's other article, "Patronage, Style, and Structure...", she discusses various aspects of Carolan's music with regard to his patronage by four family clusters. (Rimmer - 1987, 164-172)

This shows how his music changed with different regions, and different generations. Knowing which generation Carolan composed for is important because with the popularity of Italian music growing in Ireland, later generations would presumably want more Italian characteristics incorporated into their music. Different families from different regions would have changing tastes, also. Again, Rimmer takes a more in-depth discussion with form which is helpful when comparing Carolan's form to Italian, or other, forms. She discusses how Carolan's thinking like a harper would affect his music, and points out that some of his music may not have been written for the harp. (Rimmer - 1987, 172) This is significant because this music may have been written for the violin or other popular instrument in Italian music. She also shows how alterations may have occurred in transcriptions and editions, including O'Sullivan's book which, as mentioned before, is important to know when analyzing music. (Rimmer - 1987, 172)

About Carolan with relation to Italian Composers:

The only mention of Carolan and an Italian Composer by Fox, are in the few "anecdotes" that are repeated in just about every source on Carolan and Geminiani. (Fox, 120) She recounts them in the same manner as others, but there are several variations of these stories which makes it impossible to prove if they ever met in person.

Careri gives a biography of Francesco Geminiani, including his time in Dublin. Geminiani is shown to have been accessible to Carolan by his concert room, advertisements, popularity, and the correspondence of others. (Careri, 28-31) This shows, without looking at the music, that an influence was likely. (There is also a thematic catalogue in his book on pages 221-293, which gives us easy access to Geminiani's main themes for comparison.)

O'Neill discusses the attitudes of pre-seventeenth century Ireland leading up to Carolan's life, as well as those after Italian music reached its height of popularity. He also mentions the different way of thinking between "art" and "folk" musicians. (O'Neill, 265-320) This, again, gives us an insight into how Carolan and Italian composers may have perceived each other, which would affect any imitation.

O'Sullivan has a chapter entitled "Carolan and the Italian Masters" that focuses on the relationship between Carolan and Francesco Geminiani. (O'Sullivan, 144-148) This, again, is very helpful when trying to understand their thinking, but he does not give any musical comparison between the two.

Walker is almost a "primary source" as his book was published in 1786 (Carolan died in 1738). His appendix VI is devoted to "The Life of Turlough O'Carolan". He tells of his life, including the influence of Italians (no music examples). (Walker, 68-99) According to this edition of Walker, Carolan and Geminiani met (Walker, 90), but O'Sullivan cites a previous writing in which Walker simply states "Italian composer", instead of the name Geminiani. (O'Sullivan, 147) Walker also mentions Carolan writing "monody", which is an Italian concept. (Walker, 92)

Rogers' thesis (the first and second chapters) utilizes most of the afore mentioned sources (and more), but he gives his own analysis and perspective in many different areas. Along with the usual dissertation on Carolan's background and his being influenced by Geminiani and Corelli, he touches on many other aspects (although none in great depth) of this influence. He discusses dance rhythms used by Carolan, some Irish and some non-Irish, which is important when comparing these forms with others. (Rogers, 8) Rogers explains the tuning of the harp and it's relationship to accidentals in music. (Rogers, 16-20) Carolan used accidentals to get certain (sometimes clearly

Italian) sounds, and this needs to be examined. When comparing Carolan to traditional Irish music, Rogers states that he is “not as predictable” as the standard Irish tune, and gives a detailed explanation as to why, including a reference to Baroque form. (Rogers, 28) As mentioned before, Carolan’s accompaniment may have been more than what was written down. Rogers reinforces this possibility by quoting Edward Bunting (an “original” collector of Irish tunes) who described the Irish harpers as performing with “luxuriant basses”. (Rogers, 26) In chapter two, he gives an example of a Carolan tune with bass, and describes how Carolan may have accompanied himself. (Rogers, 91-93) Accompaniment is important if it shows style. He then goes on, in chapter one, with several short sections to discuss the melodic style, modality, phrasing, sequencing, form, rhythm and meter of Carolan’s music. (Rogers, 30-44) Although he does not go into great detail, this can still be a stepping stone for further discovery. Rogers specifically refers to Carolan’s Laments and Planxties as if they had their own unique form. (Rogers, 52-57) He does go into some detail here, but it would be interesting to compare these to Italian forms. He makes a specific reference to Carolan imitating Corelli by adding a jig as a coda, and further states that “this is the closest he came to the Baroque practice of the multi movement dance suite”. (Rogers, 62) Rogers mentions “Carolan’s Concerto” which may or may not have been the result of a contest between Carolan and Geminiani. (Rogers, 72) Whether it is or not, a tremendous influence could be demonstrated with this piece. It has even been referred to as “Carolan’s Concerto: Hommage to Geminiani”. (Carolan) An important aspect of the folk tradition is pointed out by Rogers: Borrowing from old tunes was standard practice, as it was in the “art” world at the time. (Rogers, 81-82) This raises an interesting question: If Carolan Borrowed from other Irish composers, how much did he borrow from Italian composers?

FURTHER STUDY NEEDED:

Although there seems to be a great deal written about Carolan's music and Italian music, there is very little in the area of musical analysis for comparison between the two. A comprehensive catalogue examining Carolan's forms and thematic devices would make this possible, and facilitate future research.

HYPOTHESIS

Since it has been generally shown that Italian composers had an influence on Carolan, this influence could be demonstrated in greater detail by comparing their structure. In order to make these comparisons, the structure in Carolan's music must first be identified and analyzed. Conclusions of this process would best be observed in catalogue form.

METHOD

TARGETS OR OBJECTS OF STUDY:

Structure may be identified from the music notation of Carolan. The number of "tunes" selected for analysis is 214, the total number currently attributed to Carolan. When available, the basses should be used as an aid in analysis, but the basic structure will come primarily from the treble line. One should keep in mind that the purpose of this analysis is for future comparison to catalogues of other composers' music.

COLLECTING AND ANALYZING DATA:

The overall method of collecting data will be qualitative. In order to compare Carolan's

structure and characteristics to others', this must first be identified from his tunes. Carolan's tunes may be found in collections of his music by Bunting, Ossian, and O'Sullivan. His structure and characteristics may then be identified, analyzed, and outlined in catalogue form. The number of each tune will correspond with those in the Ossian publication. This catalogue may then be used to compare with other composers' catalogues by future researchers.

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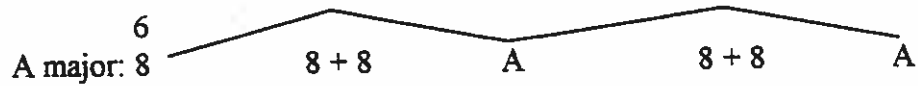
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Dolmetsch, Arnold. The Interpretation of the Music of the Seventeenth and Eighteenth Centuries. Seattle: University of Washington Press, 1969.

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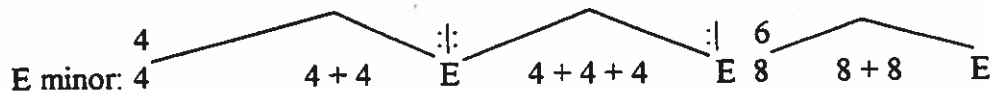
ANALYTICAL CATALOGUE
OF THE TUNES OF
TURLOUGH O'CAROLAN

1. Lady Athenry



- leading tone with repeated tonic cadences using I IV V I
- possible half cadence @ 8
- possible authentic cadence @ 24
- triadic structures

2. Mrs. Bermingham (first air)

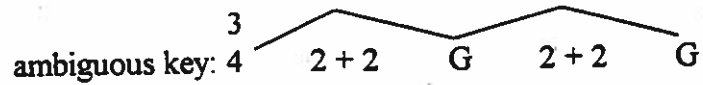


- simple duple section:
 - first 8 bars use , second section begins
 - sequencing
 - uses minor v
 - mm 17 (without repeats) begins with a possible V/III secondary dominant, but does not shift to D major
 - each section ends with an authentic cadence
- compound duple section:
 - third section jig as possible "coda"
 - sequencing
 - repeated note cadence after each 8 bars

- triadic structures

- uses III and V/III

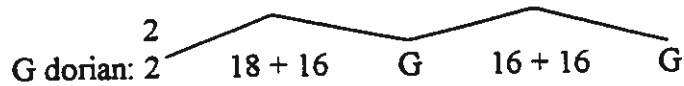
3. Mrs. Bermingham (second air)



- modal (e minor, a minor, g mixolydian)

- two bar phrases initiated with or variation thereof

4. James Betagh



- sequences (melodic and rhythmic)

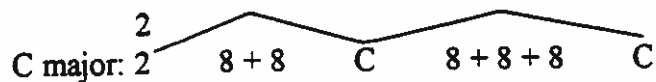
- subsemitonism with F#

- fragmentation

- segmentation

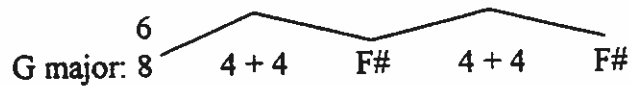
- generally, each phrase has a melodic, tonal, agogic, or metric accent on the 7th beat

5. Lady Blayne



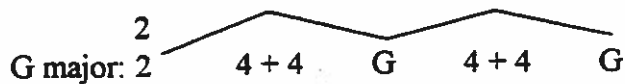
- possible theme
- each section ends with an authentic cadence
- repeated note cadence @ 32
- possible deceptive cadence @ 8, then to A minor, back to C major @ 14
- triadic structures
- sequencing (melodic and rhythmic)
- fragmentation
- retrograde

6. George Brabazon (first air)



- AABC
- each 4th bar identical and ending on V7 structure
- possible half cadences

7. George Brabazon (second air)

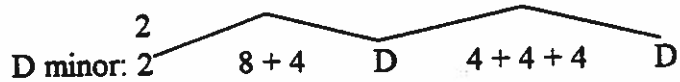


- two possible themes
- sequencing
- inversion

- variation

- last two bars of each phrase are identical and have authentic cadences

8. Sir Ulick Burke



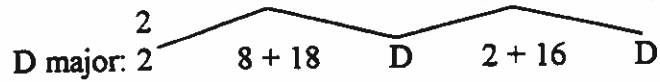
- last bar of each section identical

- last 2 bars of each phrase similar, ending in (Bb leading tone) III vi v i

- authentic cadences

- subsemitonism

9. Sir Festus Burke



- very triadic

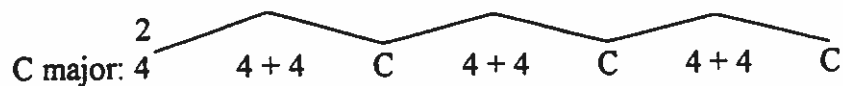
- authentic cadences @ 8, 18, and 26

- half cadences @ 4 and 20

- ends with I6/4 V I (8ve drop)

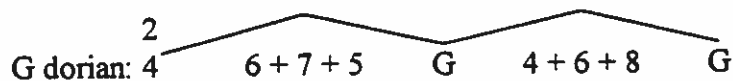
- rhythmic retrograde

10. Lady Laetitia Burke



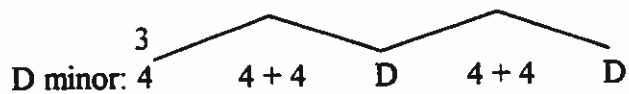
- authentic cadence at the end of each phrase
- first phrase ending with 8ve drop on tonic
- first 4 bars of last section in A minor
- authentic cadence 5th bar from end (with 8ve drop) on dominant before C
- possible I6/4 V I @ end
- sequencing (rhythmic and melodic)
- possible variations and inversions of theme

11. The Honourable Thomas Burke



- last 5 bars of each section identical
- last 2 mm of each phrase ending with 8ve jump (upward)
- sequencing
- possible rhythmic retrograde
- uses i VII i

12. Isabella Burke



- ABCb

- &/or = almost a rhythmic motive

- non-leading tone cadences

13. Planxty Burke



- last 4 mm of first two phrases identical

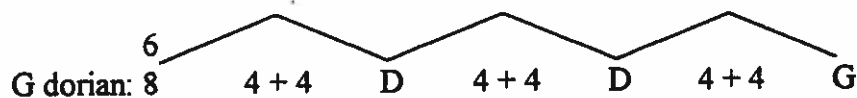
- each phrase ending with two dotted quarter notes

- parallel sequencing

- possible theme metrically retrograde in first measure

- uses first and second endings after first two sections

14. Planxty Burke



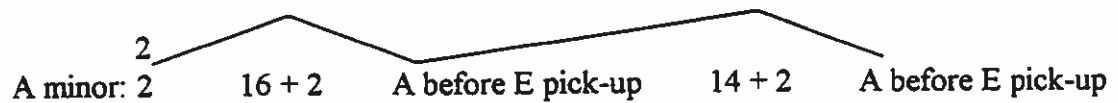
- last 4 bars of first and second section are identical

- each section ends with two dotted quarter notes

- parallel sequences

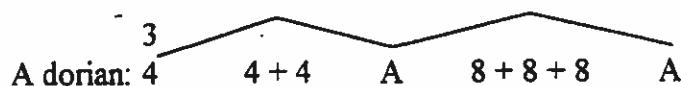
- possible theme metrically retrograde in first bar
- first and second endings in first and second sections

15. Mrs. Cole



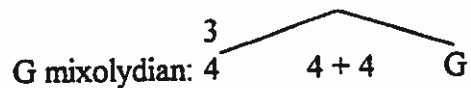
- last 10 bars of each section are imitative (almost ABCB)
- last 4 bars of each section are identical
- last 2 mm of each phrase are in bass clef (probable accompaniment) and end on V or phrygian
- third measure from the end of each section (measure before bass clef) ends on A with a non-leading tone cadence
- sequencing

16. Nancy Cooper (first air)



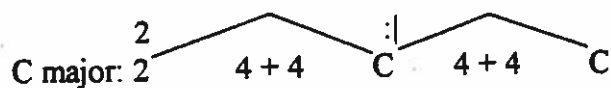
- subsemitonism (leading tone C# in m2)
- distinct phrase endings every 8 bars

17. Nancy Cooper (second air)



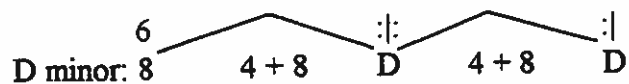
- mm 3 and 7 are similar
- includes triplets
- fermata @ end of each 4 bar phrase

18. Sir Charles Coote



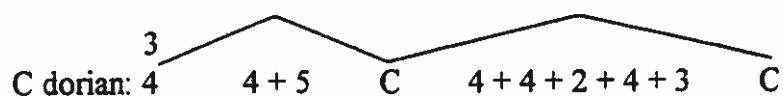
- inversion
- retrograde
- leading tone authentic cadences at end of each section
- first 4 bars of each section end with possible half cadence
- last bar of each section ends with a half note and quarter note, both C

19. Edward Corcoran



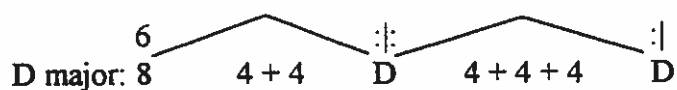
- sequencing
- subsemitonism (leading tones C#, F#, G# ; almost modulating)
- authentic cadences after each section (the last with a leading tone)

20. Mrs. Costello



- very irregular and assymetrical

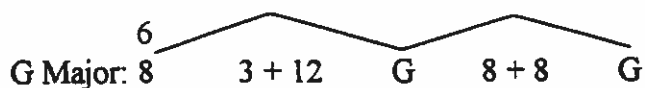
21. Planxty Crilly



- sequences

- last 3 bars of each section are identical and end with possible IV V7 I (authentic cadence)

22. Sir Edward Crofton

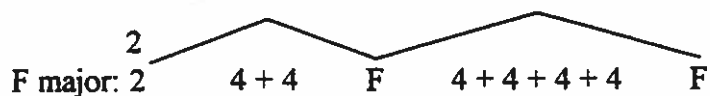


- rhythmic retrograde

- each section ends with an authentic cadence

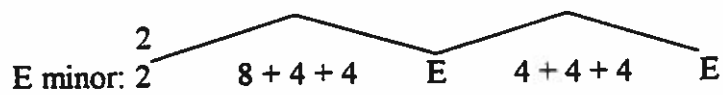
- sequencing

23. James Crofton



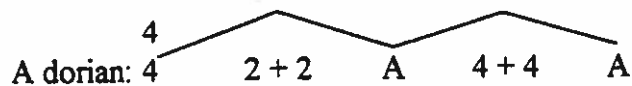
- authentic cadence after each section
- sequencing
- fragmentation
- inversion

24. Mrs. Crofton



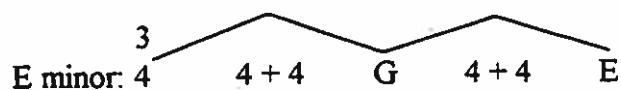
- possible inverted fragment
- sequencing
- last 1 ½ bars of each section are identical with authentic cadences

25. Miss Crofton



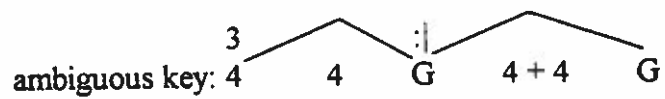
- ends many sub-phrases
- both sections end with
- possible theme in second section

26. Bridget Cruise (first air)



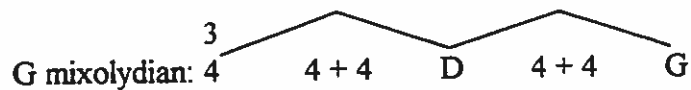
- non-leading tone cadence after first section
- ends with authentic cadence

27. Bridget Cruise (second air)



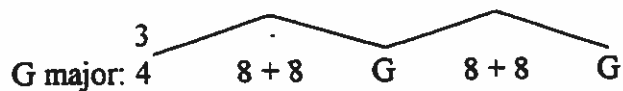
- modal
- AABA

28. Bridget Cruise (third air)



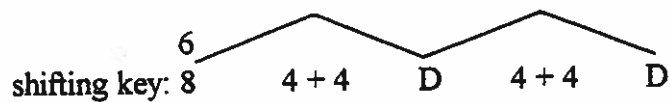
- AABA
- repeated tone ending with quarter note, quarter note, half note

29. Bridget Cruise (fourth air)



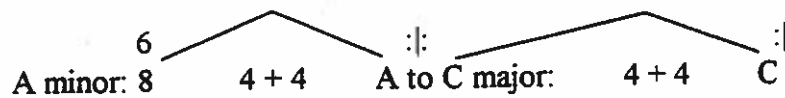
- AABa
- both sections end with authentic cadence

30. Richard Cusack



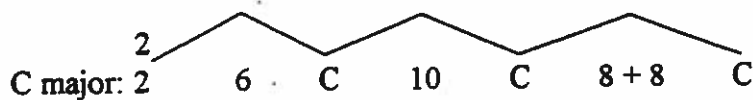
- key shifts between D major and D dorian
- each section ends with an authentic cadence
- AaBa'

31. James Daly



- first section uses first and second endings
- sequencing
- uses authentic cadences
- final rhythmic pattern of each section is two dotted quarter notes

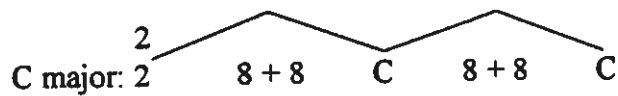
32. Dr. Delany



- first section is marked "grave" (possible introduction); others are "allegro moderato"
- sequencing (rhythmic and melodic)
- rhythmic theme throughout

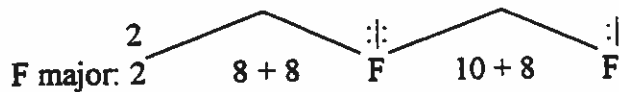
- inversion
- indefinite type of cadence after first section
- second and third sections end with authentic cadences

33. Mrs. Delany



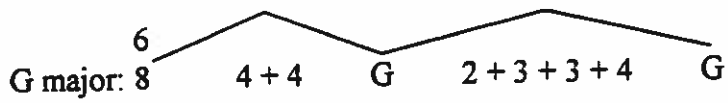
- each section ends with a repeated note authentic cadence (quarter note, quarter note, half note)
- fermata on last note
- sequencing
- fragmentation
- retrograde
- first 8 bars of each phrase end with possible half cadence and non-leading tone cadence, respectively

34. Lord Dillon



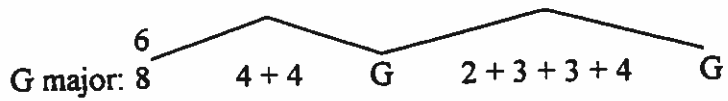
- each section ends with repeated note authentic cadence (half note, half note)
- mid-section phrases end with half cadences
- sequencing

35. Gerald Dillon



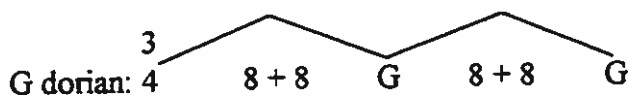
- possible half cadence after first 4 bars
- last 2 ½ bars of each section are identical with authentic cadences
- possible theme
- sequencing
- metrical retrograde

36. Gerald Dillon



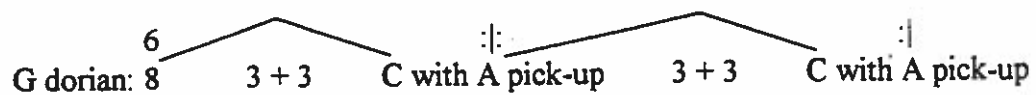
- last 2 ½ bars of each section are identical
- sequencing
- metric retrograde
- possible theme
- each section ends with an authentic cadence
- half cadence after first 4 bars

37. Fanny Dillon



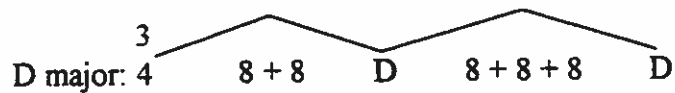
- possible theme
- fragmentation
- inversion
- last 4 2/3 bars of each section are identical

38. Counsellor Dillon



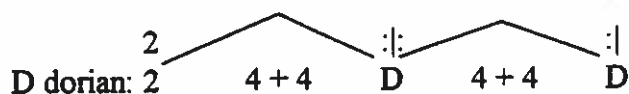
- last 2 bars of each phrase are identical

39. Luke Dillon



- last 1 2/3 bars of each section are identical, and end with an authentic cadence
- possible deceptive cadence after first 8 bars
- possible half cadences in first two sets of 8 bars in second section
- inversion

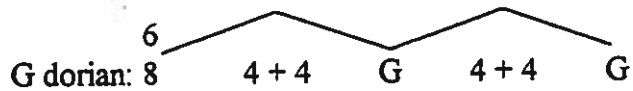
40. Edward Dodwell



- sequencing

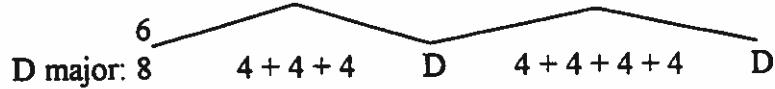
- inversion
- subsemitonism (C# leading tone @ end of 2nd bar)
- possible major V in bar 4

41. Planxty Drew



- AaBa'
- sequencing

42. John Drury (first air)



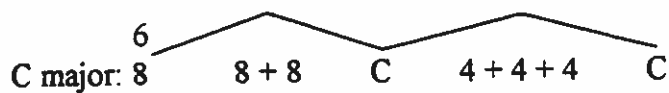
- authentic cadences
- sequencing

43. John Drury (second air)



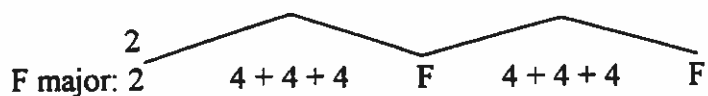
- combination of two keys
- sequencing
- possible manipulation of theme

44. William Eccles



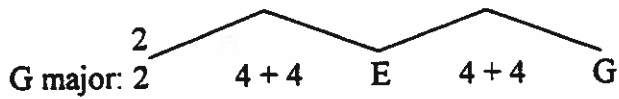
- sequencing
- fragmentation
- inversion
- possible theme
- authentic cadences at the end of each section
- possible non-leading tone cadence after first 8 bars
- possible half cadences after first two sets of 4 bars in second section

45. Mrs. Edwards



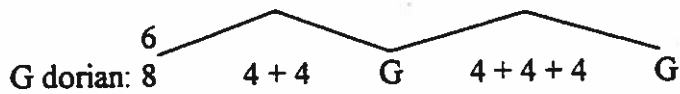
- possible theme
- sequencing
- each section ends with an authentic cadence
- possible half cadences after the first two 4 bar phrases in the second section
- typical Italian or German ending

46. Mrs. Fallon



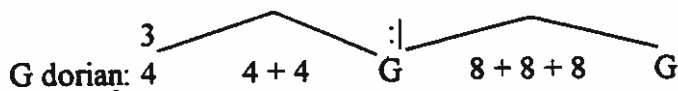
- sequencing
- inversion
- authentic cadences after each 4 bar phrase in second section
- possible half cadence after first 4 bars

47. Mrs. Farrel



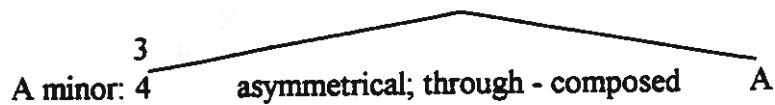
- fifth set of 4 bars = sequence with retrograde division of the beat

48. Miss Fetherston, or Carolan's Devotion



- AABCa

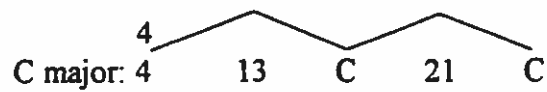
49. Mrs. Garvey (first air)



- sequencing

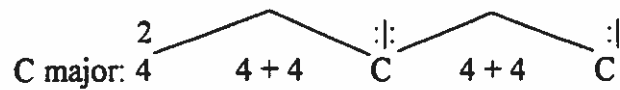
- metrical retrograde
- subsemitonism (possible melodic minor with F# and G# leading tones)
- possible V and III
- authentic cadence after 10th bar and at end

50. Mrs Garvey (second air)



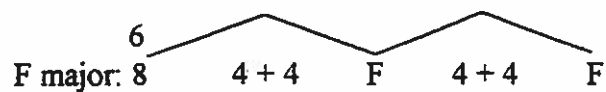
- subsemitonism (G# leading tone; possible III)
- 5-7 bars from end in bass clef (probable accompaniment)

51. Lady Gethin



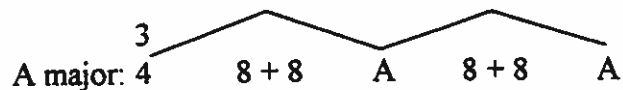
- Abab
- possible theme
- sequencing
- inversion

52. Miss Goulding



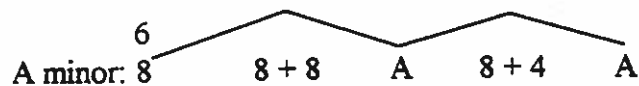
- last 2 bars of each section are identical and end with an authentic cadence
- sequencing

53. Dr. John Hart, Bishop of Achonry



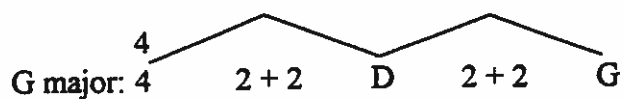
- last 4 bars of each section are identical with authentic cadences
- sequencing

54. Mrs. Harwood



- subsemitonism (F# and G# leading tones; possible melodic minor)
- possible secondary dominant with V/III and V/vi
- sequencing

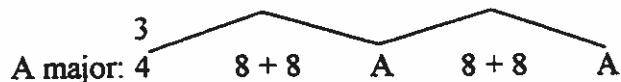
55. Robert Hawkes



- third bar of each section is identical
- sequencing

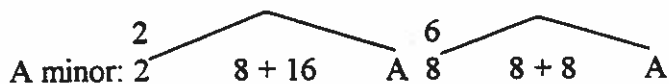
- non-leading tone cadence after first section
- authentic cadences after each 2 bars in last section

56. Hewlett



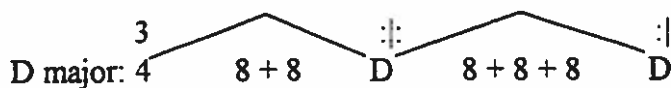
- AABa
- possible manipulation of theme

57. Captain Higgins



- second section jig as possible "coda"
- sequencing in second section
- possible theme
- subsemitonism (G# leading tone; possible V)
- two possible shifts to C major using III, V/III, and ii/III
- authentic cadences after first section and both sets of 8 bars in second section

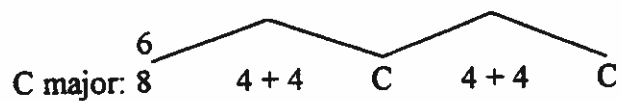
58. Lord Inchiquin



- last 4 bars of each section are identical

- sequencing

59. Colonel John Irwin

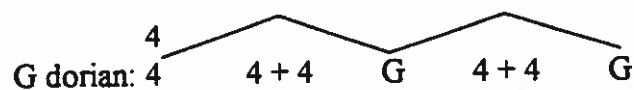


- AABA

- sequencing

- authentic cadences after each section

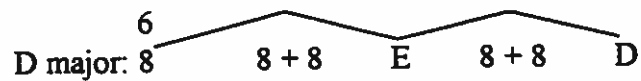
60. Colonel Irwin



- sequencing

- inversion

61. John Jameson



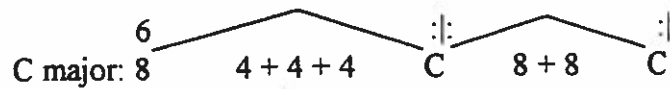
- AaBb

- sequencing

- second section marked "chorus"

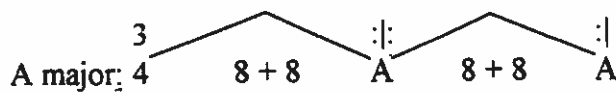
- possible D mixolydian at end
- cadence every 4 bars: authentic, half, authentic, half, half, authentic (the last two might not exist if modal)

62. Babtist Johnston



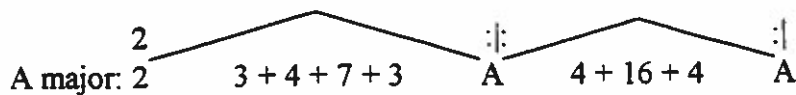
- AaBb
- first section has first and second endings
- sequencing
- authentic cadences after each section
- possible half cadences after first two sets of 4 bars

63. John Jones



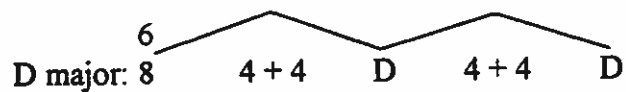
- possibly through - composed without repeats
- each section ends with an authentic cadence

64. Loftus Jones



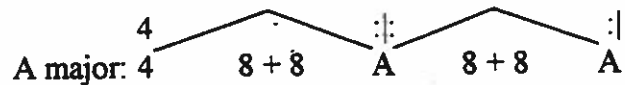
- sequencing
- possibly through - composed without repeats
- each section ends with an authentic cadence
- possible cadences after each phrase

65. Thomas Morres Jones, or Bumper Squire Jones



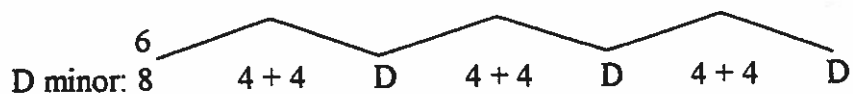
- last 1 ½ bars of each section are identical
- sequencing
- possible V7
- each section ends with an authentic cadence
- possible non - leading tone cadence after first 4 bars
- possible half cadence after first 4 bars of second section

66. Robert Jordan



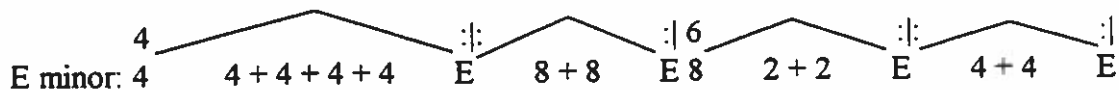
- cadence every 4 bars
- sequencing with metric retrograde

67. Thomas Judge, or Carolan's Frolic



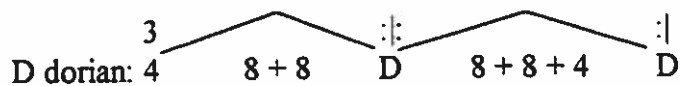
- each section ends with an authentic cadence
- first 4 bars of the first and last section end with a half cadence
- sequence
- possible V/III
- second section ends with possible "dorian 6th"

68. Mrs. Judge



- jig section as possible "coda"
- each section ends with an authentic cadence
- possible half cadences after first three sets of 4 bars
- sequencing
- metric retrograde
- secondary dominant and / or III, VII

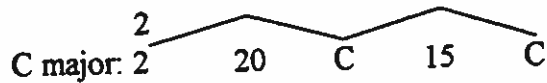
69. Mrs. Keel



- sequencing

- mm 4 and 5 are identical to mm 34 and 35 (without repeats)

70. Daniel Kelly



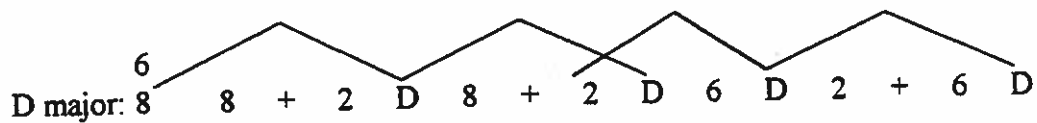
- through - composed

- non-leading tone cadence after first section

- authentic cadence at end

- sequencing

71. Hugh Kelly



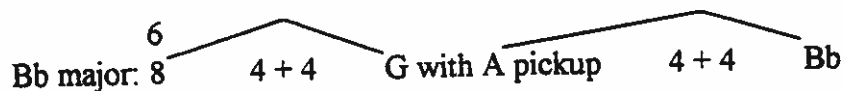
- AaBb with the end of "a" overlapping the beginning of "B"

- repeated melodic pattern in last 2 bars

- each section ends with an authentic cadence

- A, B, and b have similar endings

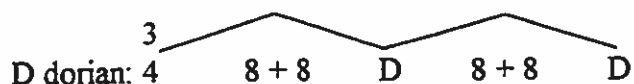
72. John Kelly



- ends with authentic cadence

- sequencing

73. Mabel Kelly



- no "F's"

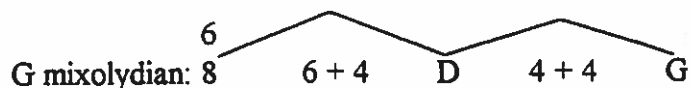
- in bar 6 and bar 29, C is almost tonicized ; bar 29 includes a C major triad

- fermata at end of each section

- every 4 bar set, except third, ends with the same metric pattern,

emphacizing D or A as the last note alternatively

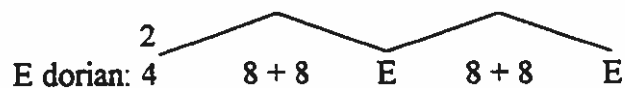
74. Patrick Kelly



- sequencing

- last 6 bars, except very last one, are almost in F major

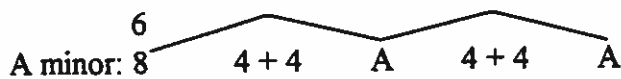
75. Susanna Kelly



- possible theme manipulation

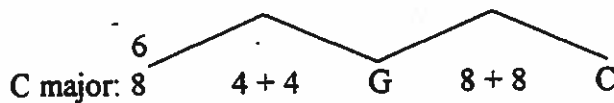
- sequencing
- inversion
- retrograde
- possible change of key to E mixolydian in bars 11 and 12

76. Planxty Kelly



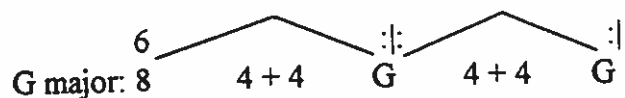
- each section ends with an authentic cadence
- ABCb
- sequencing
- semitonism (F# neighboring tone; F# and G# leading tones (possible melodic minor))

77. Lord Louth



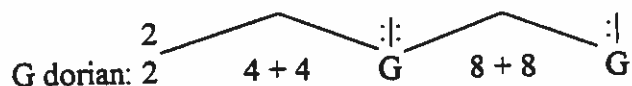
- authentic cadence at end
- half cadence after first phrase of each section
- sequencing
- metric retrograde

78. Henry Mac Dermott Roe (first air)



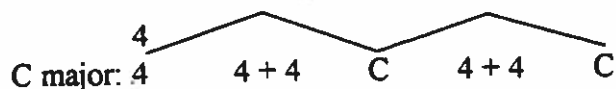
- sequencing
- first section has first and second endings
- AaBb
- last 2 bars of "a" and "b" are identical
- if divided into two bar segments: ABAbCDcb

79. Henry Mac Dermott Roe (second air)



- first section has first and second endings
- uses Eb to get to G minor for the last 2 bars of the first section
- sequencing
- last 1 ½ bars of each 8 bar phrase in the second section are identical

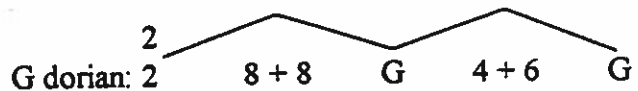
80. Henry Mac Dermott Roe (third air)



- each section ends with an authentic cadence
- AaBC

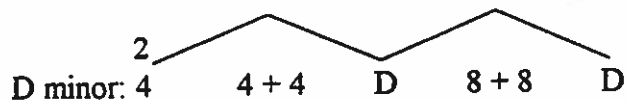
- sequencing
- fragmentation

81. Mrs. Mac Dermott Roe



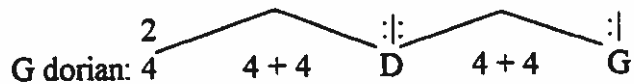
- sequencing
- subsemitonism (F# leading tone)

82. Mrs. Anne Mac Dermott Roe



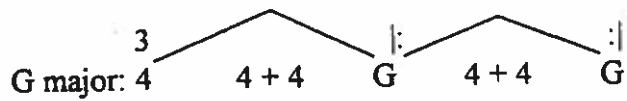
- subsemitonism with B natural
- authentic cadences after the first section, and after the first 8 bars of the second
- possible half cadence after the first 4 bars

83. Elizabeth Mac Dermott Roe



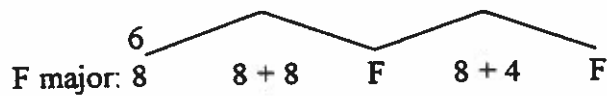
- no "B's"

84. Father Brian Mac Dermott Roe



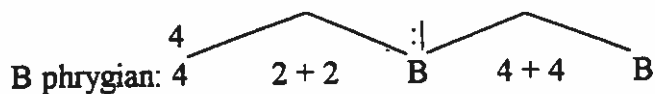
- non-leading tone cadence every 4 bars
- imitation

85. Edmond Mac Dermott Roe



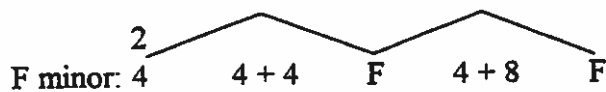
- sequencing
- authentic cadences after first two sets of 8 bars, and at end
- possible half cadence after third set of 8 bars

86. John Mac Dermott



- last bar of each section is identical

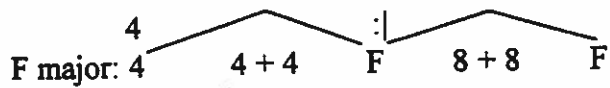
87. Miss Mac Dermott, or The Princess Royal



- authentic cadence after each section

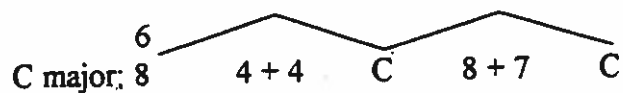
- sequencing
- metric retrograde
- possible theme
- imitation

88. Dolly Mac Donough



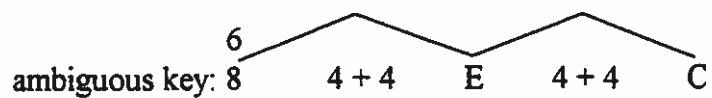
- last 4 bars of each section are identical with authentic cadences
- first 8 bars of second section end with possible leading tone authentic cadence in A minor
- subsemitonism (C# leading tone in possible V/iii to iii)

89. Dr. Mac Mahon, Bishop of Clogher



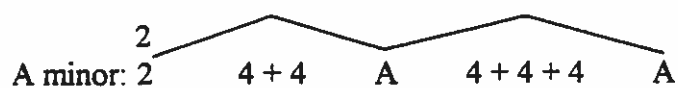
- sequence
- inversion
- authentic cadence at end

90. Miss Mac Murray



- sequencing

91. Betty Mac Neill



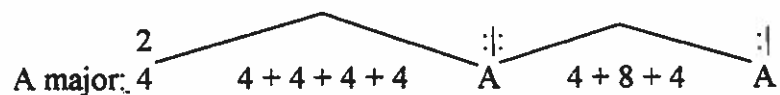
- last 2 bars of each section are identical

- sequencing

- possible secondary dominant with V/III

- possible III 's

92. Morgan Magan



- possible theme

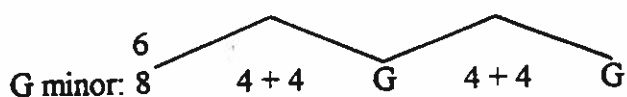
- last two bars of each section are identical with authentic cadences

- sequencing

-imitation

- possible half cadence after 8 bar phrase (mid - second section)

93. Captain Magan



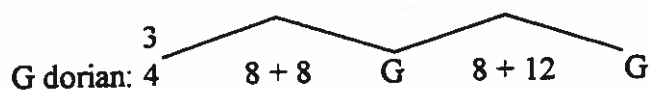
- AaBa'

- subsemitonism (F# leading tone in 3rd bar of second section; possible V to i)

- non-leading tone cadence after first section

- authentic cadences after each 4 bars in second section, the first as a leading tone

94. Kitty Magennis



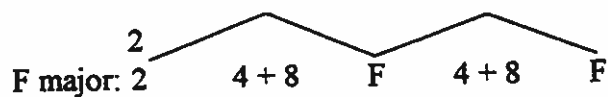
- inversion

- retrograde

- hint at F major in 4th and 5th bars from the end

- 4 bar phrases: ABCDAbc?D

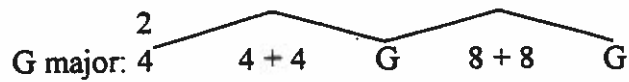
95. Brian Maguire



- sequencing

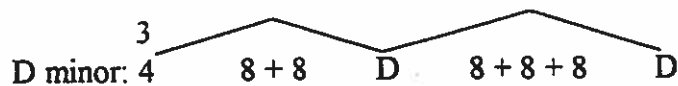
- authentic cadences after each section

96. Constantine Maguire



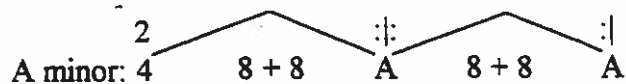
- sequencing
- authentic cadences after each 4 bar phrase in first section, and after each 8 bar phrase in second section

97. Mr. Malone



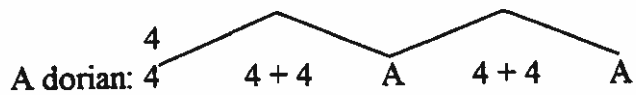
- sequencing
- authentic cadences after first two sets of 8 bars, and at end
- possible half cadences after first two sets of 8 bars in second section

98. Margaret Malone



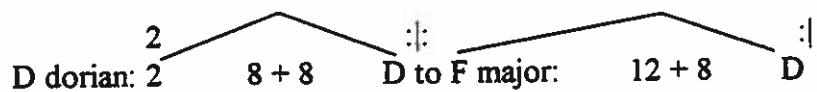
- sequencing
- uses possible III to change key (to C major) with an abrupt V/III back to i (A minor) in each phrase
- possible authentic cadence (in C major) after first 8 bars

99. Catherine Martin



- sequencing

100. Lord Massereene



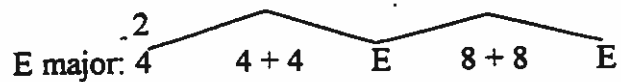
- sequencing

- return to D dorian in last 2 bars

- authentic cadence before the last 2 bars

- possible half cadence after first 12 bars in second section

101. Mrs. Maxwell (first air)

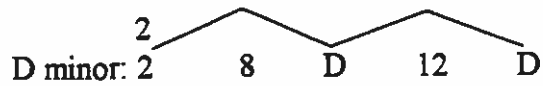


- authentic cadence after each section

- second section could also be divided into 7 + 9 bars, with a non-leading tone

cadence after 7 bars

102. Mrs. Maxwell (second air)



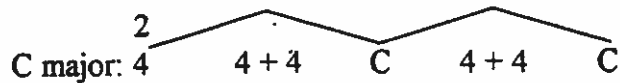
- possible III and VIII
- sequences
- ends with an authentic cadence

103. John Moore



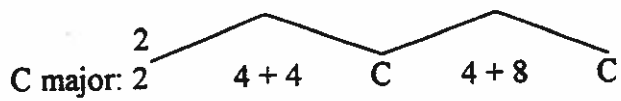
- begins in C mixolydian, then subtly shifts to F major
- an Eb in the fourth bar from the end tonicizes the second to last note Bb
- sequencing
- jig section as possible "coda"

104. Peggy Morton



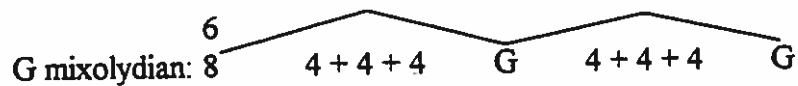
- Abab
- each section ends with an authentic cadence

105. Miss Murphy



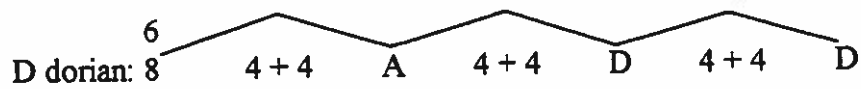
- sequencing
- each section ends with an authentic cadence
- possible half cadence after first four bars of each section

106. Miss Noble



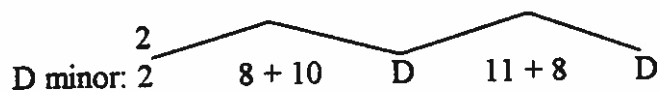
- sequencing

107. John Nugent



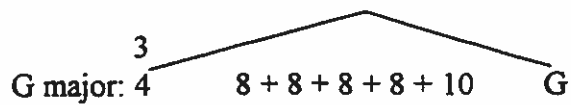
- possibility of ambiguity between D dorian and A minor
- sequencing
- last two sections have identical last bar

108. Mrs. Nugent



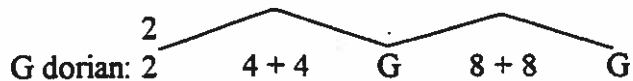
- sequencing
- possible III and VII
- authentic cadences after each section
- half cadences after first 8 bars, and first 11 bars of second section

109. Elizabeth Nugent



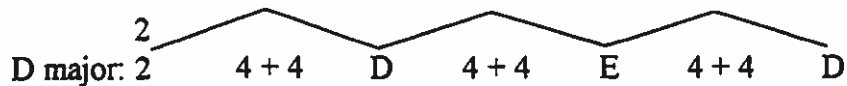
- sequencing
- half cadence after last 8 bar phrase
- non-leading tone, repeated note cadence at end
- through-composed

110. Grace Nugent



- sequencing

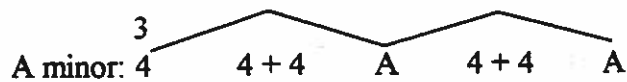
111. Betty O'Brien



- possible theme

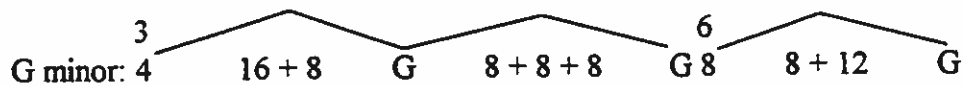
- inversion
- 4 bar phrases in first section end in non-leading tone cadences
- authentic cadences after first 4 bars of second section, and at end
- half cadence after second section

112. Donal O'Brien



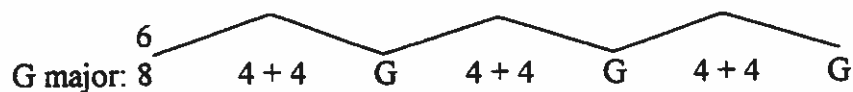
- half cadence after first section
- leading tone authentic cadence at end
- subsemitonism (F# leading tone to possible v; G# leading tone in possible V to I)

113. Mr. O'Connor



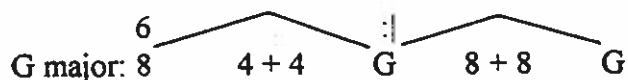
- authentic cadence ending each section, and after the first 8 bars of the last section
- half cadence after the first 8 bars of the second section
- possible theme
- subsemitonism (F# in possible V to i)
- sequencing
- inversion
- jig as possible "coda"

114. John O'Connor



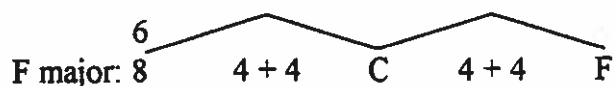
- last section marked "chorus"
- sequencing
- last 2 bars of first and last sections are identical
- each section ends with an authentic cadence
- first 4 bars of last section end with a half cadence

115. Maurice O'Connor (first air)



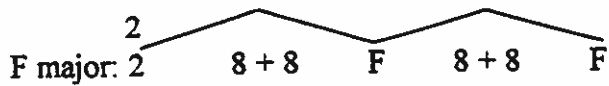
- sequencing
- first and second endings in first section
- authentic cadences every 4 bars in first section, and every 8 bars in second section, the last being with a leading tone

116. Maurice O'Connor (second air)



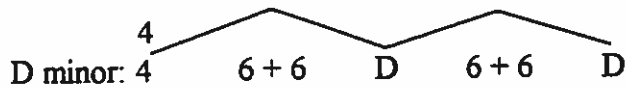
- sequencing
- half cadence after first section
- authentic cadences after second section

117. Maurice O'Connor (third air)



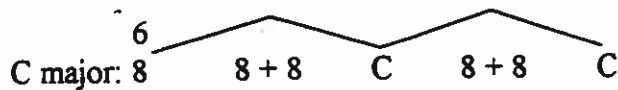
- sequencing
- authentic cadences after each section
- possible half cadence after first 8 bars in second section

118. Mrs. O'Connor



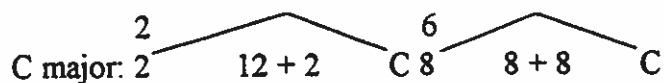
- sequencing
- subsemitonism (C# leading tone in possible V to i)
- authentic cadences after each section, the first with a leading tone

119. Dr. O'Connor



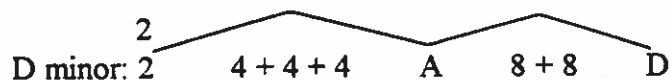
- "very tonal"
- sequencing
- authentic cadences after each section
- subsemitonism (G# leading tone to possible vi implying a minor after the first 8 bars in the second section)

120. Michael O'Connor (first air)



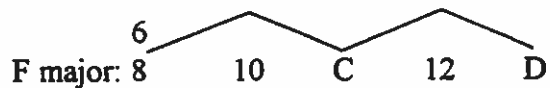
- authentic cadences after each section, the first having an anticipation
- sequencing
- jig section a possible “coda”
- “very tonal”

121. Michael O'Connor (second air)



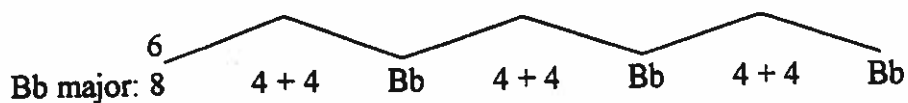
- sequencing
- authentic cadence at end
- possible half cadence after first section
- subsemitonism (possible III and V with C# to i)

122. Denis O'Conor (first air)



- inconclusive cadences
- sequencing
- ends in D minor

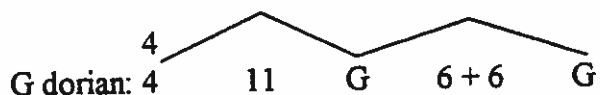
123. Denis O'Connor (second air)



- AaA'a'Bb

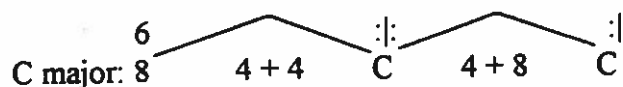
- authentic cadences after each section

124. Mrs. O'Connor



- each phrase ending identical

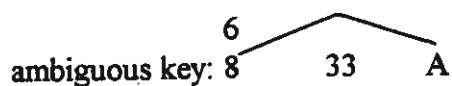
125. Charles O'Connor



- authentic cadence at end

- sequence

126. Colonel Manus O'Donnell

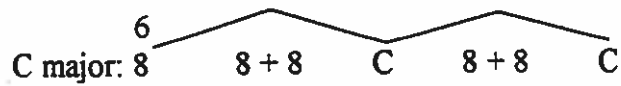


- possibly begins in G major, and ends in A minor

- rhythmic retrograde

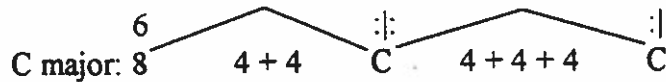
- sequencing

127. Hugh O'Donnell



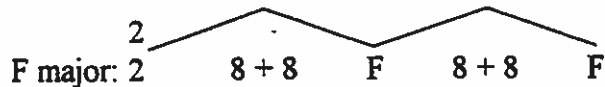
- authentic cadences after each section
- imitation
- sequence

128. O'Flinn



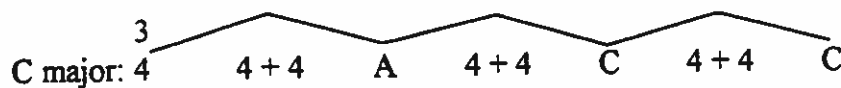
- authentic cadences after each section
- half cadence after first 4 bars of second section
- possible non-leading tone cadence after first 4 bars
- sequencing

129. Colonel O'Hara



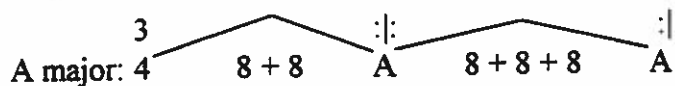
- authentic cadences after each section
- sequencing

130. Kean O'Hara (first air)



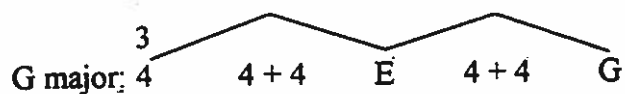
- authentic cadences after last two sections
- half cadences after first 4 bars of last two sections
- sequencing

131. Kean O'Hara (second air)



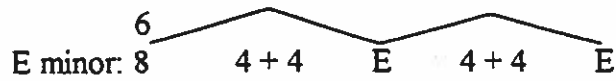
- authentic cadences after each section
- half cadence after first 8 bars in second section

132. Kean O'Hara (third air)



- authentic cadence at end
- possible non-leading tone cadence after first 4 bars in second section
- AA'A'B

133. Captain O'Kain



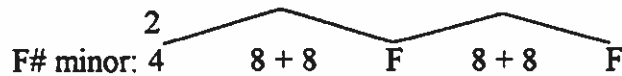
- AABa

- possible authentic cadences after each section

- metric retrograde

- subsemitonism (D# leading tone in possible V to i)

134. Kathering O'More

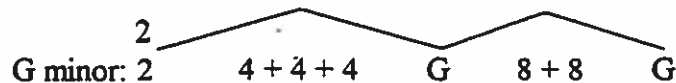


- ABCb

- sequencing

- possible non-leading tone cadences after each section

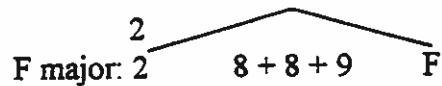
135. Mrs. O'Neill of Carlane



- authentic cadences after each section, and after the first 8 bars in the second section

- sequencing

136. Mrs. O'Neill

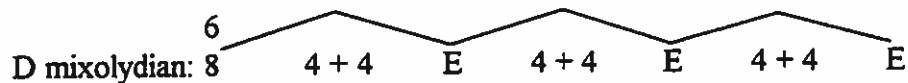


- authentic cadence after second 8 bar phrase

- possible non-leading tone cadences after first 8 bar phrase and last 9 bar phrase

- sequencing

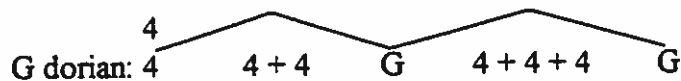
137. Mary O'Neill, or Carolan's Favourite Jig



- if divided into sets of two bars: AaBCDdbcEee'c'

- sequencing

138. O'Reilly of Athcarne

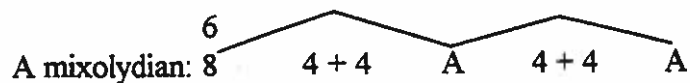


- AaBCa

- inversion

- note: another version exists with an Eb

139. Conor O'Reilly

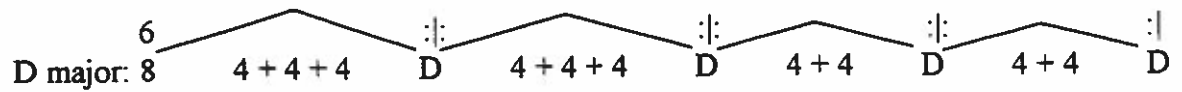


- AABC

- F# only in key signature, but no "C's" in tune

- sequencing

140. John O'Reilly (first air)

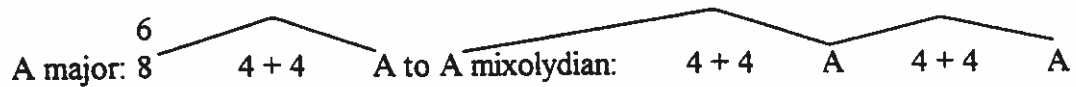


- authentic cadences after each section

- AaBb

- sequencing

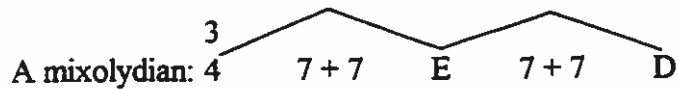
141. John O'Reilly (second air)



- possible non-leading tone cadence after the first section

- ABCDCD

142. Owen O'Rourke

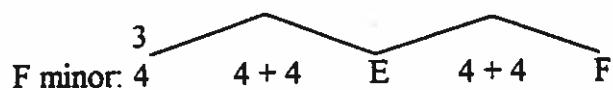


- sets of 7 bars are divided into 3 + 4 bar sets

- imitation

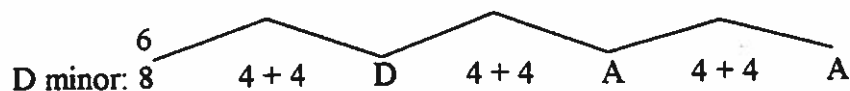
- sequencing
- end implies D major

143. Mrs. O'Rourke



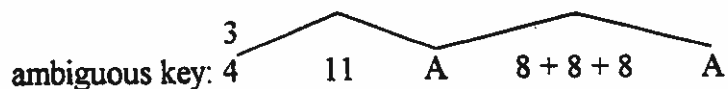
- subsemitonism (D natural and E natural leading tones; possibly melodic minor, but sometimes has a #6th to natural 7th scale degree; second to last bar has A natural)
- possible mid-shift to Eb mixolydian

144. Planxty O'Rourke (first air)



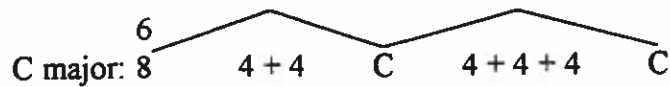
- authentic cadences after first and last sections
- half cadence after second section
- subsemitonism (one B natural)
- sequencing

145. Planxty O'Rourke (second air)



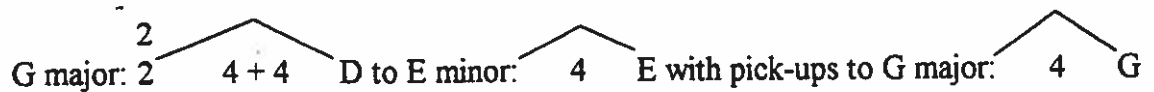
- possible A minor
- subsemitonism (G# and C# leading tones)
- chromaticism
- possible VII, IV, and V
- leading tone authentic cadences after each section

146. Frank Palmer



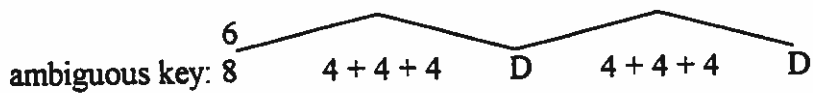
- sequencing
- half cadences after first 4 bars of each section
- authentic cadences after second set of 4 bars in second section, and at the end of each section

147. Squire Parsons



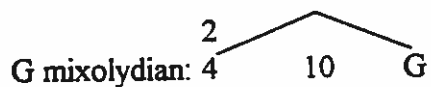
- uses possible IV/V in bar 6 to modulate to D major; all other changes of key are abrupt
- half cadence after first 4 bars
- authentic cadences after 2nd, 3rd, and 4th sets of 4 bars, and in 6th bar

148. Tobias Peyton



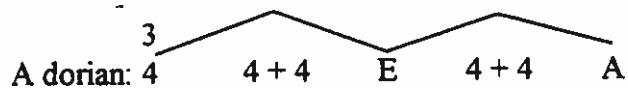
- key shifts between C lydian, C major, and D dorian (at phrase endings)
- sequencing

149. John Peyton



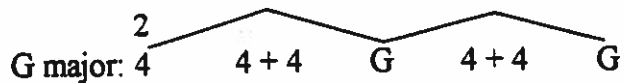
- irregular
- through-composed
- bars 3 and 4 are identical to 5 and 6
- bar 8 is identical to 9

150. Eleanor Plunkett



- sequencing
- somewhat irregular

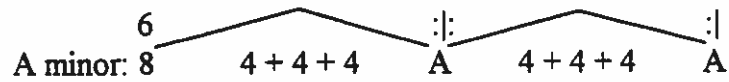
151. James Plunkett



- AABA

- authentic cadences after each section

152. Planxty Plunkett

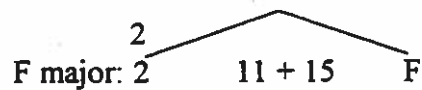


- first section has first and second endings

- sequencing

- authentic cadences after each section

153. David Power



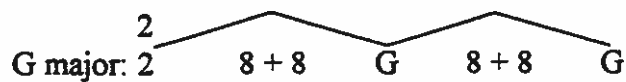
- "original" in C major

- possible theme

- sequencing

- inversion

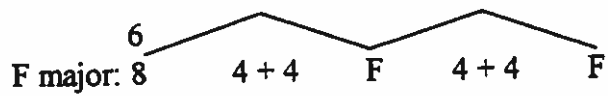
154. Mrs. Power, or Carolan's Concerto



- authentic cadences after each section

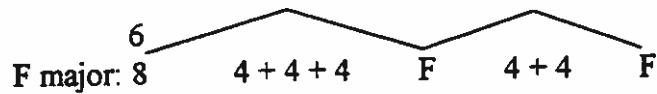
- possible half cadence after first 8 bars
- sequencing

155. Fanny Power



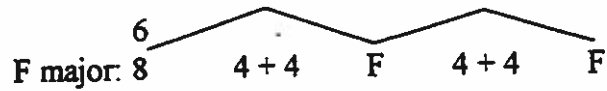
- sequencing
- authentic cadences after each section

156. Mervyn Pratt



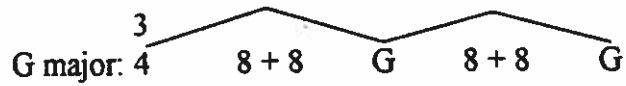
- authentic cadence at end
- sequencing

157. George Reynolds



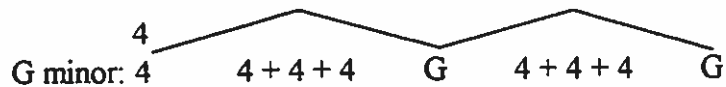
- AaBa'
- sequencing

158. Lady St. John



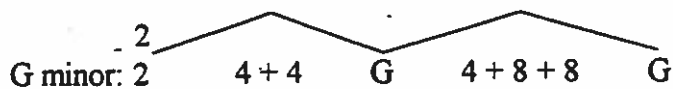
- authentic cadences after each section
- sequencing

159. Sir Arthur Shaen



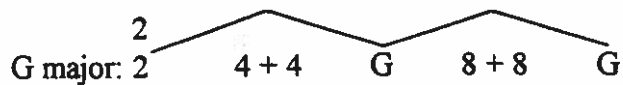
- half cadence after first section
- authentic cadence at end
- "original" has no time signature

160. Major Shanly



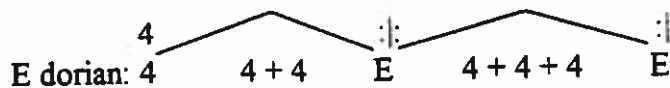
- shifts to G dorian in the last 8 bars, then to G major in the last 4 bars
- authentic cadence after each section

161. Dr. John Stafford, or Carolan's Receipt



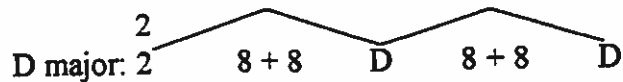
- ABaCDb (4 bar sets)
- sequencing
- non-leading tone cadences after each section

162. Mrs. Sterling



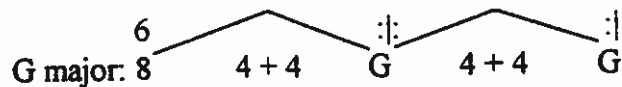
- first section has first and second endings
- sequencing

163. Captain Sudley, or Carolan's Dowry



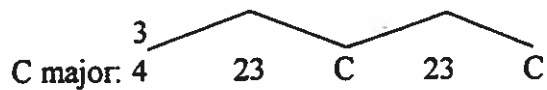
- authentic cadences after each section
- 4 bar phrases: ABaCDEa'F
- sequencing

164. Planxty Sweeny



- AaBa
- authentic cadences after each section

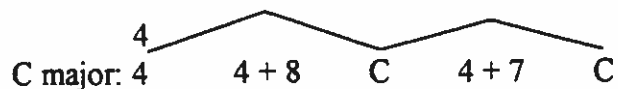
165. Mr. Waller



- authentic cadence after each section

- sequencing

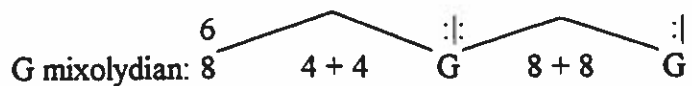
166. Mrs. Waller



- authentic cadences after each section

- sequences

167. William Ward

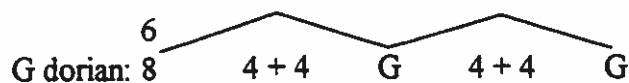


- first and last bar of each section are identical

- sequencing

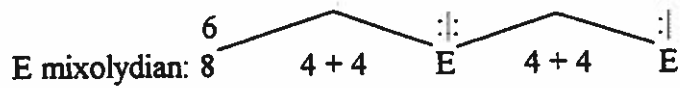
- "original" has no key signature; this has one flat in the key signature, but there are no "B's" in the tune

168. Planxty Wilkinson



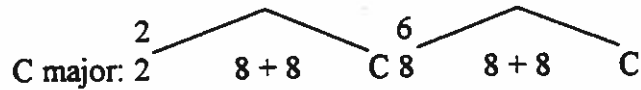
- AaBa'
- E natural in bar 6 is an Eb in an "original"
- subsemitonism (one F# leading tone)

169. Lady Wrixton



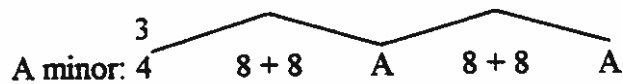
- AaBa'
- first two bars of second section imply E major
- sequencing

170. General Wynne



- authentic cadence after every 8 bars
- jig section possible "coda"
- last bar of first and second sets of 8 bars is identical

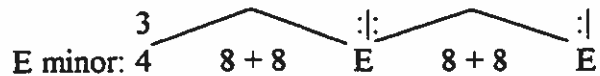
171.



- AaBa'

- sequencing
- authentic cadence after each section

172.



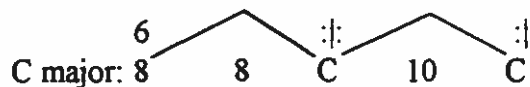
- AA'A'A''
- sequencing
- non-leading tone cadence after each section

173.



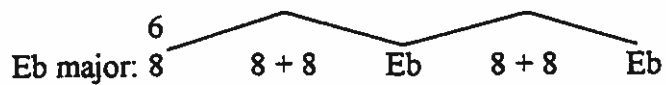
- second section changes to F major after 2 bars, then to G mixolydian after three more bars
- added F# in G major section
- B natural in 3rd and 4th bar from end

174.



- last 2 bars of each section are the same with an authentic cadence
- sequencing

175.

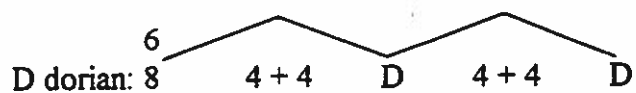


- AaBa

- sequencing

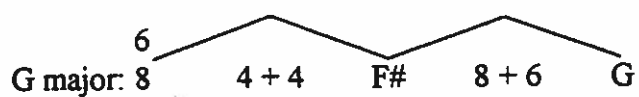
- each section ends with an authentic cadence

176.



- AaBa'

177.



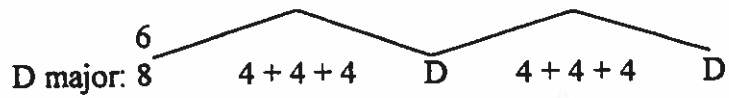
- first section ends with a half cadence

- second section ends with an authentic cadence

- sequencing

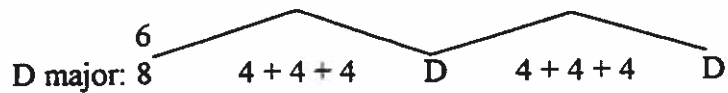
- subsemitonism (F natural; possible diminished ii or bVII)

178.



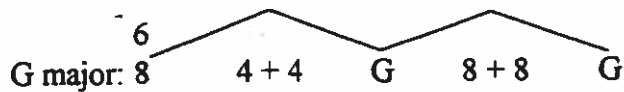
- each section ends with an authentic cadence
- sequencing

179.



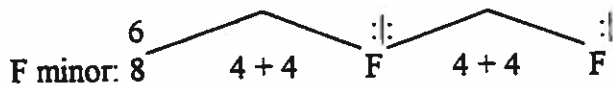
- last bar of each section is identical, and each ends with an authentic cadence
- sequencing
- inversion
- first bar of first two 4 bar phrases is identical

180.



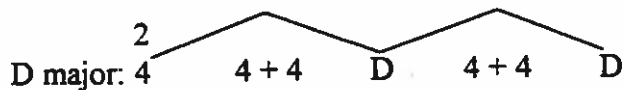
- 4 bar phrases: AaBbCD
- each section ends with an authentic cadence
- bars 15 - 18 are in D dorian or D major with a possible V/V
- sequencing

181. All Alive



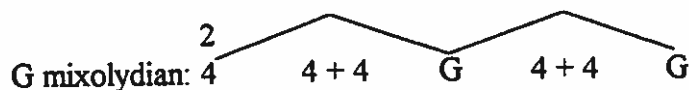
- last 1 ½ bars of each phrase are identical, and each end with an authentic cadence
- possible III
- sequencing

182. Blind Mary



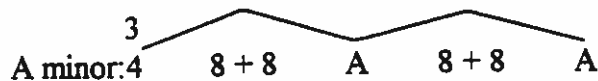
- last bar of each section is identical, and each ends with an authentic cadence

183. Carolan's Cap



- first bar of first and second 4 bar phrases are identical

184. Carolan's Cottage

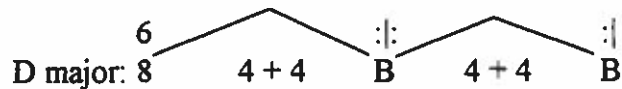


- in 4 bar phrases: AaBCDdbc
- subsemitonism (G# leading tone; possible harmonic minor)

- sequencing

- each section ends with an authentic cadence

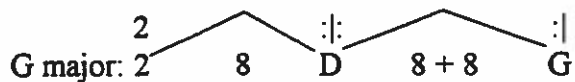
185. Carolan's Cup



- AaBa'

- indefinite cadences; implied minor phrase endings

186. Carolan's Draught

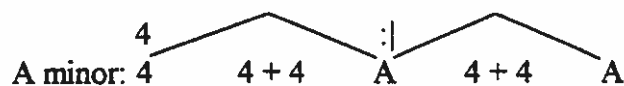


- possible IV/V in bar 6 to D major

- possible I/V in bar 20 (without repeats) to G major

- each section ends with an authentic cadence

187. Carolan's Dream




- each section ends with a non-leading tone cadence

- ABCB

- subsemitonism (C# leading tone; implies A major 6 bars into each section)

188. Carolán's Farewell to Music

G dorian: 4 

- ABCcb

- sequencing

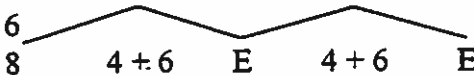
189. Carolán's Maggot

G mixolydian: 4 

- sequencing

- inversion

190. Carolán's Quarrel with the Landlady

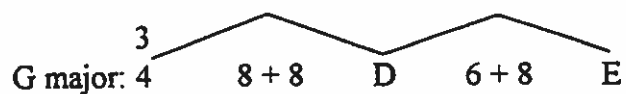
G major: 8 

- ABCB; B can be divided into Abb

- sections end in E dorian

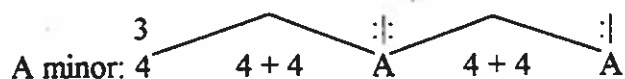
- sequencing

191. Carolán's Ramble to Cashel



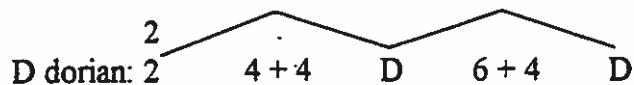
- first section ends with a half cadence
- indefinite cadence at end
- 4 bar phrases: ABCbD(6bars)Ee
- possible modal elements

192. Cremona



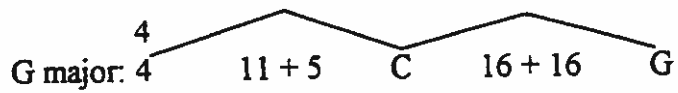
- subsemitonism (G# leading tone; possible harmonic minor)
- sequencing
- each section ends with an authentic cadence

193. The Dark, Plaintive Youth



- AaBa'
- sequencing
- inversion

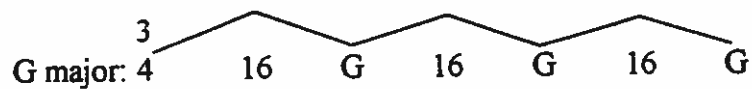
194. The Elevation



- authentic cadences after first 11 bars and at end

- sequencing

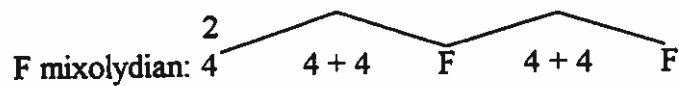
195. The Fairy Queen



- each section ends with "8ve drop" authentic cadence

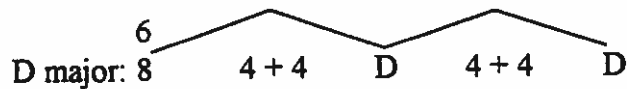
- sequencing

196. The Landlady



- AaBa'

197. Ode to Wiskey

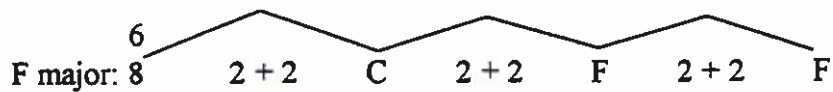


- AaBC

- each section ends with an authentic cadence

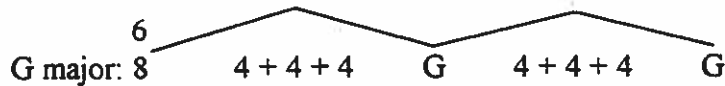
- possible half cadence after the first 4 bars
- possible authentic cadence after the first 4 bars of the second section

198. One Bottle More



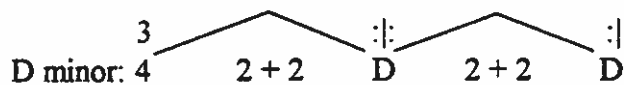
- half cadence after first section
- authentic cadences after last two sections

199. The O'Rourkes Feast



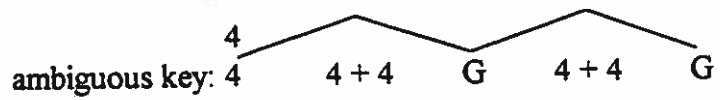
- non-leading tone cadence after first section
- authentic cadence after second section
- possible theme
- sequencing
- inversion

200. The Seas are Deep



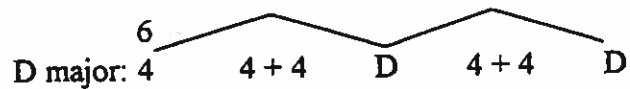
- possible authentic cadence after first section
- authentic cadence at end

201. Separation of Soul and Body



- tonal / modal irregularities

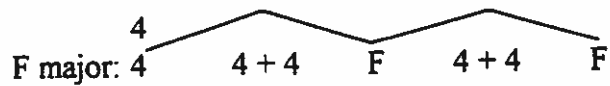
202. Sheebeg and Sheemore



- each section ends with an authentic cadence

- sequencing

203. The Two William Davises



- each section ends with an authentic cadence

- possible motive

- sequencing

- ABCB

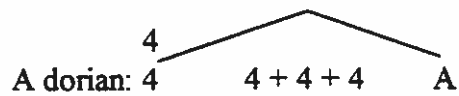
204. Variations on the Scottish Air "Cock up your Beaver"

- typical variation
- includes a tonal shift

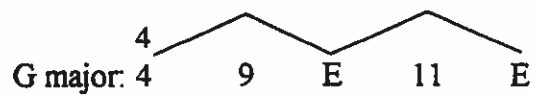
205. Variations on the Scottish Air "When she cam ben"

- typical variation
- mostly tonal
- includes a coda
- includes a real sequence

206. Lament for Sir Ulick Burke

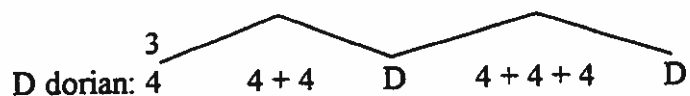


207. The Clergy's Lamentation

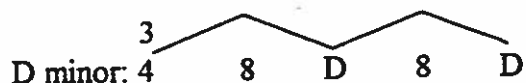


- each section ends on a possible IV

208. Lord Galway's Lamentation

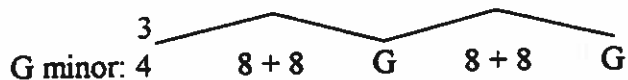


209. Lament for Charles Mac Cabe



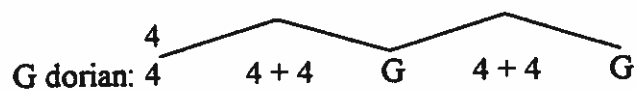
- each section ends with an authentic cadence
- subsemitonism (C# leading tone; possible harmonic minor)

210. Lament for Terence Mac Donough



- non-leading tone cadence after first section
- authentic cadence after second section
- last 4 bars of each section are identical
- sequencing

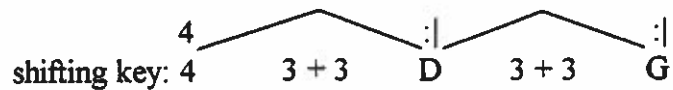
211. Lament for Owen Roe O'Neill



- ABaC

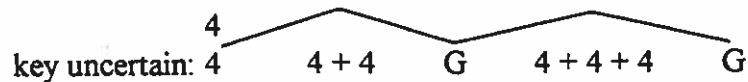
- last 6 bars G minor with F# leading tone
- leading tone authentic cadence at end

212. Lament for Owen O'Rourke



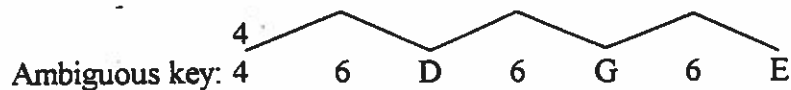
- melodically divided into 3 bar phrases, but modally divided into 4 bar phrases
- 4 bar sets: D phrygian, G mixolydian, G minor

213. Squire Wood's Lamentation on the Refusal of his Halfpence



- possible G major, but includes F natural

214. Captain O'Neill



- key shifts between possible E minor, D major (with possible V/V), G mixolydian, and G major
- subsemitonism (includes C# leading tones)

SPREADSHEET SUMMARY
OF THE TUNES OF
TURLOUGH O'CAROLAN

numbers correspond with those of the tunes

	<u>modal</u>	<u>tonal</u>	<u>ambiguous key</u>	<u>shifting key or mode</u>	<u>secondary dominant</u>	<u>symmetrical</u>	<u>somewhat symmetrical</u>	<u>asymmetrical</u>	<u>includes a "coda"</u>	<u>has form of is sectional</u>	<u>theme or motive</u>	<u>one or more cadences</u>	<u>triadic structures</u>	<u>subsemitonism</u>	<u>sequencing</u>	<u>variation</u>	<u>retrograde</u>	<u>inversion</u>	<u>fragmentation</u>	<u>simple duple</u>	<u>compound duple</u>	<u>simple triple</u>	<u>first and second endings</u>	<u>stylistic markings</u>	<u>imitation</u>
1		X				X					X	X									X				
2		X			X		X		X			X			X					X	X				
3	X		X			X																X			
4	X						X						X	X					X	X					
5		X					X			X	X	X			X	X		X	X						
6		X				X			X		X											X			
7		X				X				X	X				X	X		X		X					
8		X					X				X		X							X					
9		X						X			X	X					X			X					
10		X				X				X	X				X	X		X		X					
11	X						X								X	X				X					
12		X				X			X	X	X											X			
13	X					X				X					X		X				X		X		
14	X					X				X					X		X				X		X		
15		X		X			X		X		X				X					X					
16	X						X						X									X			
17	X					X																X			
18		X				X					X						X	X		X					
19		X				X					X		X		X						X				
20	X							X														X			
21		X					X				X				X						X				
22		X						X			X				X		X				X				
23		X					X				X				X		X	X	X						
24		X					X				X				X		X	X	X						
25	X						X		X											X					
26		X				X					X											X			
27	X		X			X			X													X			
28	X					X			X													X			
29		X				X			X		X											X			
30			X			X			X		X										X				
31		X				X				X	X				X						X		X		
32		X					X			X	X				X		X		X					X	
33		X				X					X				X		X		X						
34		X					X				X				X					X					
35		X						X		X	X				X						X				
36		X						X		X	X				X		X				X				
37	X					X				X							X	X				X			
38	X					X															X				
39		X					X				X						X					X			

	<u>numbers correspond with those of the tunes</u>	<u>modal</u>	<u>tonal</u>	<u>ambiguous key</u>	<u>shifting key or mode</u>	<u>secondary dominant</u>	<u>symmetrical</u>	<u>somewhat symmetrical</u>	<u>asymmetrical</u>	<u>includes a "coda"</u>	<u>has form of is sectional</u>	<u>theme or motive</u>	<u>one or more cadences</u>	<u>triadic structures</u>	<u>subsemitonism</u>	<u>sequencing</u>	<u>variation</u>	<u>retrograde</u>	<u>inversion</u>	<u>fragmentation</u>	<u>simple duple</u>	<u>compound duple</u>	<u>simple triple</u>	<u>first and second endings</u>	<u>stylistic markings</u>	<u>imitation</u>
40	X						X								X	X			X		X					
41	X						X				X					X						X				
42			X					X					X			X						X				
43				X					X			X				X							X			
44			X					X				X	X			X			X	X		X				
45			X					X				X	X			X						X				
46			X					X					X			X			X			X				
47	X							X								X		X				X				
48	X							X			X												X			
49			X						X				X		X	X		X					X			
50			X						X						X							X				
51			X					X			X	X				X			X			X				
52			X					X					X			X							X			
53			X					X					X			X							X			
54			X			X		X							X	X						X				
55			X					X					X			X						X				
56			X					X			X	X				X							X			
57			X		X	X		X		X		X	X		X	X					X	X				
58			X					X								X							X			
59			X					X			X	X				X						X				
60	X							X								X			X		X					
61			X		X			X			X	X				X						X			X	
62			X					X			X	X				X						X		X		
63			X					X					X			X							X			
64			X						X				X			X					X					
65			X					X					X			X						X				
66			X					X					X			X		X				X				
67			X		X	X		X					X			X						X				
68			X			X		X		X			X			X		X				X	X			
69	X							X								X							X		X	
70			X						X				X			X						X				
71			X					X			X		X			X						X			X	
72			X					X					X			X						X				
73	X							X						X									X		X	
74	X				X			X														X				
75	X				X			X				X				X		X	X			X				
76			X					X			X		X		X	X		X	X			X				
77			X					X					X			X		X				X				
78			X					X			X					X						X		X		

numbers correspond with those of the tunes

	<u>modal</u>	<u>tonal</u>	<u>ambiguous key</u>	<u>shifting key or mode</u>	<u>secondary dominant</u>	<u>symmetrical</u>	<u>somewhat symmetrical</u>	<u>asymmetrical</u>	<u>includes a "coda"</u>	<u>has form of is sectional</u>	<u>theme or motive</u>	<u>one or more cadences</u>	<u>triadic structures</u>	<u>subsemitonism</u>	<u>sequencing</u>	<u>variation</u>	<u>retrograde</u>	<u>inversion</u>	<u>fragmentation</u>	<u>simple duple</u>	<u>compound duple</u>	<u>simple triple</u>	<u>first and second endings</u>	<u>stylistic markings</u>	<u>imitation</u>
79	X			X			X							X					X			X			
80		X				X			X		X				X			X	X						
81	X							X					X	X					X	X					
82		X					X				X		X							X					
83	X					X														X					
84		X				X					X													X	
85		X					X				X			X							X				
86	X					X														X					
87		X					X			X	X				X		X			X				X	
88		X			X	X					X		X							X					
89		X						X				X			X		X				X				
90			X			X								X							X				
91		X			X		X				X				X					X					
92		X				X				X	X				X					X				X	
93		X				X			X		X		X								X				
94	X			X			X		X							X	X					X			
95		X				X					X			X						X					
96		X					X				X				X					X					
97		X					X				X				X								X		
98		X		X	X	X					X				X					X					
99	X					X									X					X					
100	X	X		X			X				X				X					X					
101		X					X				X									X					
102		X						X			X				X					X					
103			X				X		X						X					X	X				
104		X				X			X		X									X					
105		X					X				X				X					X					
106	X					X									X						X				
107	X			X		X									X						X				
108		X						X			X				X					X					
109		X						X			X				X							X			
110	X						X								X					X					
111		X				X				X	X						X			X					
112		X				X					X		X									X			
113		X					X	X		X	X		X	X			X				X	X			
114		X				X					X				X						X			X	
115		X				X					X				X						X		X		
116		X				X					X				X						X				
117		X				X					X				X					X					

	<u>modal</u>	<u>tonal</u>	<u>ambiguous key</u>	<u>shifting key or mode</u>	<u>secondary dominant</u>	<u>symmetrical</u>	<u>somewhat symmetrical</u>	<u>asymmetrical</u>	<u>includes a "coda"</u>	<u>has form of its sectional</u>	<u>theme or motive</u>	<u>one or more cadences</u>	<u>triadic structures</u>	<u>subsemitonism</u>	<u>sequencing</u>	<u>variation</u>	<u>retrograde</u>	<u>inversion</u>	<u>fragmentation</u>	<u>simple duple</u>	<u>compound duple</u>	<u>simple triple</u>	<u>first and second endings</u>	<u>stylistic markings</u>	<u>imitation</u>
118		X				X					X		X	X					X						
119		X				X					X		X	X						X	X				
120		X					X		X			X		X						X	X				
121		X					X				X		X	X						X					
122		X		X				X				X		X							X				
123		X				X			X		X										X				
124	X							X												X					
125		X					X				X				X						X				
126			X	X				X							X	X					X				
127		X				X					X				X						X			X	
128		X					X				X				X						X				
129		X				X					X				X					X					
130		X				X					X				X							X			
131		X					X				X											X			
132		X				X			X		X											X			
133		X				X			X		X		X			X					X				
134		X				X			X		X			X						X					
135		X					X				X				X					X					
136		X						X			X				X					X					
137	X					X			X						X						X				
138	X						X		X								X			X					
139	X					X			X						X						X				
140		X					X		X		X				X						X				
141	X	X		X		X			X		X										X				
142	X			X		X									X							X		X	
143		X		X		X							X									X			
144		X				X					X		X	X							X				
145			X				X				X		X									X			
146		X					X				X				X						X				
147		X		X	X						X									X					
148			X	X		X									X						X				
149	X							X												X				X	
150	X					X									X							X			
151		X				X			X		X									X					
152		X				X									X						X		X		
153		X					X			X					X		X			X					
154		X				X					X				X					X					
155		X				X					X				X						X				
156		X					X				X				X						X				

numbers correspond with those of the tunes	modal	tonal	ambiguous key	shifting key or mode	secondary dominant	symmetrical	somewhat symmetrical	asymmetrical	includes a "coda"	has form of is sectional	theme or motive	one or more cadences	triadic structures	subsemitonism	sequencing	variation	retrograde	inversion	fragmentation	simple duplet	compound duplet	simple triple	first and second endings	stylistic markings	imitation
157		X				X				X					X						X				
158		X				X						X			X							X			
159		X				X						X								X					
160	X	X		X			X					X								X					
161		X					X			X		X			X					X					
162	X						X								X					X			X		
163		X				X				X		X			X					X					
164		X				X				X		X									X				
165		X				X						X			X							X			
166		X						X				X			X					X					
167	X						X								X						X				
168	X					X				X				X							X				
169	X			X		X				X					X						X				
170		X				X			X			X								X	X			X	
171		X				X				X		X			X							X			
172		X				X				X		X			X							X			
173	X	X		X		X								X							X				
174		X						X							X						X				
175		X				X				X		X			X						X				
176	X					X				X											X				
177		X						X				X		X	X						X				
178		X				X						X			X						X				
179		X				X						X			X			X			X			X	
180		X		X	X	X				X		X			X						X				
181		X				X						X			X						X				
182		X				X						X								X					
183	X					X														X				X	
184		X				X				X		X		X	X							X			
185		X				X				X											X				
186		X		X	X	X						X								X					
187		X				X				X		X		X						X					
188	X						X			X					X					X					
189	X						X								X			X		X					
190	X	X		X		X				X					X						X				
191		X		X			X			X		X										X			
192		X				X						X		X	X							X			
193	X						X			X					X			X		X					
194		X						X				X			X					X					
195		X				X						X			X							X			

<u>numbers correspond with those of the tunes</u>	<u>modal</u>	<u>tonal</u>	<u>ambiguous key</u>	<u>shifting key or mode</u>	<u>secondary dominant</u>	<u>symmetrical</u>	<u>somewhat symmetrical</u>	<u>asymmetrical</u>	<u>includes a "coda"</u>	<u>has form of is sectional</u>	<u>theme or motive</u>	<u>one or more cadences</u>	<u>tridic structures</u>	<u>subsemitonism</u>	<u>sequencing</u>	<u>variation</u>	<u>retrograde</u>	<u>inversion</u>	<u>fragmentation</u>	<u>simple duple</u>	<u>compound duple</u>	<u>simple triple</u>	<u>first and second endings</u>	<u>stylistic markings</u>	<u>imitation</u>
196	X					X				X										X					
197		X				X				X		X									X				
198		X				X						X									X				
199		X				X					X	X			X			X			X				
200		X				X						X										X			
201			X			X						X								X					
202		X				X						X			X						X				
203		X				X				X	X	X			X					X					
204				X												X									
205		X							X						X	X									
206	X						X													X					
207		X						X												X					
208	X						X															X			
209		X				X						X		X								X			
210		X				X						X			X							X		X	
211	X	X		X		X				X		X								X					
212	X			X		X														X					
213			X				X													X					
214	X	X	X	X	X	X								X						X					

CONCLUSIONS

Because of unique artistic qualities, special notice should be taken with Carolan tunes numbered 71 and 145. Number 71 has overlapping phrases in which the end of one section merges with the beginning of another by two bars. Number 145 has an exceptional amount of chromaticism not found in any other Carolan tune. This may well be derived from the fashionable Italian madrigal.

It is beyond the scope of this work to look further in the music of Italian composers. Any direct influence between Carolan and Italian composers, though of interest, is speculative and forcibly inconclusive. However, the analysis of Carolan's tunes provides an invaluable reference catalogue, which can be used by future scholars to continue research in many different directions. For example, if a scholar wants to know of any possible secondary dominants in Carolan's tunes, one needs to simply look up secondary dominant in the spreadsheet summary. The spreadsheet identifies all the tunes with this quality, and the tunes may then be looked up in the analysis section for more detail (i.e. what kind of secondary dominant). Since a catalogue of this nature has not been previously compiled and published, the analysis of Carolan's tunes in this reference will save future scholars many hours of tedious work.

The Anti-Bacterial Effects of Propolis on a Variety of Bacteria

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A McNair Scholars Program Project

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Abstract

The ethanol extract of propolis (EEP) was investigated for its anti-bacterial properties on various bacteria. Our study tested fourteen different bacteria of varying morphology and found 1 mg/mL propolis to have only a bacteriostatic effect on three of the fourteen bacteria tested. The bacteria effected by 1 mg/mL propolis were *Serratia marscesens*, *Staphylococcus aureus* and *Streptococcus pyogenes*. Of the fourteen bacteria tested, propolis showed no signs of bactericidal activity. From our results, we have concluded that the propolis tested had little or no effect on most bacteria. Since propolis showed only bacteriostatic activities and no bactericidal activities, we feel that propolis does not make an effective anti-microbial under the conditions of this study.

Introduction

Propolis (sometimes referred to as 'bee glue') is the common name for the resinous substance collected by honeybees from various plant sources (9). The word propolis is derived from the Greek *pro-*, in defense, and *polis-*, the city, that is defense of the city or in this case the hive. Bees use propolis inside the hive to seal holes and cracks, repair damages that occur to the comb, and strengthen and seal the borders and entrances of the hive (9,16). Propolis is also used to embalm invaders that are too big to be transported out of the hive such as moths, snails, beetles and mice (9,16). One of the main functions of propolis in the hive is to act as a biocide (6). The incidence of bacteria and molds are lower inside the hive than in the atmosphere outside the hive and it has been suggested that propolis is in fact responsible (9).

Bees obtain propolis from the boughs, leaves and buds of trees. Its color varies from yellow-green to dark brown depending on its plant source and age. Propolis consists primarily of plant exudates gathered by bees and mixed with bees' wax and small amounts of sugar (10). Most propolis exudates are gathered from various indigenous poplar (*Populus* spp.) trees, except in regions where poplars are not available, then the bees will seek other indigenous plants or flowers (10). Most exudate components are incorporated into propolis without alterations, but it is likely that some of the components are subjected to enzymatic changes by the bees' saliva during the collection or addition of the exudates to bees' wax to make propolis (6,10). The content of propolis varies greatly and so will the amount of propolis in the hive, between different colonies, and different

regions depending on the availability and the botanical origin of the exudates (13,16). It has also been noted that the amount of propolis gathered varies amongst the different species of honeybees (9).

The medicinal properties of propolis have been historically recognized since ancient times. As early as 79-23 B.C., the great Roman scholar Pliny the Elder identified the medicinal action of propolis, citing its abilities to reduce swelling, soothe pain, and heal the most hopeless sores (3). The Incas (circa 1600) used propolis as a topical ointment for inflammation and swelling (3). In Italy, Antonius Stradivarius (1644-1737) used propolis as an ingredient in the varnish of his stringed instruments and is still used today in rosin for stringed instruments (3,6). Propolis was also used during the Boer War (1888-1902) in a preparation of propolis with vaseline called 'propolisin vasogen'. It was used in wound healing and in tissue regeneration (3,9). For many years, propolis has been used in folk medicine for the treatment of malignant tumors and wounds (6,10). Europeans have long recognized the value of propolis and it is widely used as a component in both pharmaceutical and cosmetic products, such as anti-acne preparations, facial creams, ointments, and lotions (16). It has also been marketed for burn treatment, neurodermatitis, leg ulcers, psoriasis, morphoea, herpes simplex, rheumatism, gout, sprains, and as an anaesthetic in dental medicine (6,9).

The precise composition of raw propolis varies with the plant sources available to the bees. In general, it is composed of 50% resin and vegetable balsam, 30% wax, 10% essential and aromatic oils, 5% pollen and 5% various other substances including organic debris (6). The ethanol extract of propolis (EEP) is the most

common extract used and is comprised of over 200 constituents (6). Current research suggests EEP does indeed have anti-bacterial, anti-fungal, anti-viral, anti-protozoal, anti-inflammatory, anti-carcinogenic, anti-oxidant, anaesthetic and immunostimulatory properties (2,6,9,11,14,15,16).

The process of making the propolis tincture, 'propolis balsam', involves dissolving raw propolis in 95% ethanol, then running it through a filter to remove debris such as wax and wood chips (6). There are too many constituents comprising propolis to name them all, but the major groups of compounds present include: amino acids, aliphatic acids and their esters, aromatic acids and their esters, alcohols, aldehydes, chalcones, dehydrochalcones, flavanones, flavones, hydrocarbons, ketones, terpenoids and other compounds (10). Of these compounds the flavonoids have been the most studied and have been shown to have anti-bacterial, anti-viral, anti-fungal, anti-protozoal, and anti-tumor properties (6,9,10,11). Some studies also suggest that the flavonoids are responsible for propolis' anti-inflammatory effect (6). Aromatic acids and their esters have also been shown to have anti-fungal, anti-viral and anti-bacterial properties (10).

It has been suggested by earlier studies that propolis has more anti-bacterial effects on Gram positive bacteria than Gram negative bacteria (7,12). In more recent studies, EEP has been found to have anti-bacterial activity against a range of commonly encountered Gram negative and Gram positive rods and cocci, including *Mycobacterium tuberculosis* (6,13,14,16). Recent studies suggest that the anti-bacterial effects of propolis are species dependent. These studies have

also shown propolis to exhibit bacteriostatic (to inhibit bacterial growth) or bactericidal (to kill bacteria) activity against various strains of *Staphylococcus aureus*, *Corynebacterium*, *Bacillus alvei*, *Bacillus brevis*, *Bacillus larvae*, *Bacillus megaterium*, *Bacillus subtilis*, *Salmonella choleraesuis*, *Salmonella dublin*, *Salmonella enteritidis*, *Salmonella gallinarum*, *Salmonella pullorum*, *Salmonella typhosa*, *Shigella dysenteriae*, *Shigella sonnei*, *Proteus vulgaris*, *Rhodobacter sphaeroides*, *Listeria monocytogenes*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Enterobacter aerogenes*, and most strains of *Staphylococcus aureus* and *Streptococcus faecalis* (6,9,11,13,14,16). Propolis was found to be ineffective against almost all strains of *Escherichia coli* and *Bacillus mesentericus* (6,9,11,13). All strains of *Mycobacterium* tested, including *Mycobacterium avium*, were inhibited by propolis with the exception of *Mycobacterium tuberculosis*. In this case, only about 30% of *M. tuberculosis* strains examined were inhibited and the rest were resistant to propolis (6,9,14,16).

Even though it has been used since ancient times, we still have much to learn about propolis. Previous studies are limited and some are contradictory. One reason for inconsistent results may be the variation in propolis composition between various regions (9,10). In addition to examining the anti-bacterial effects of propolis on some species that have previously been examined, this study also intends to examine bacteria that have not previously been tested. These include: *Bacillus cereus*, *Clostridium perfringes*, *Staphylococcus epidermidis*, *Mycobacterium smegmatis*, *Serratia marscesens* and *Salmonella typhimurium*. With the growing research in support of the bactericidal effects of propolis, more

research is needed to more accurately assess its ability to act upon different groups of bacteria.

Materials and Methods

Bacteria and growth conditions

Fourteen strains of bacteria were selected for evaluation in this study. The strains included: *Bacillus cereus*, *Clostridium perfringes*, *Escherichia coli*, *Klebsiella pneumoniae*, *Listeria monocytogenes*, *Mycobacterium smegmatis*, *Neisseria subflava*, *Pseudomonas aeruginosa*, *Salmonella typhimurium*, *Serratia marscesens*, *Shigella dysenteriae*, *Staphylococcus aureus*, *Staphylococcus epidermidis* and *Streptococcus pyogenes*. The bacteria were obtained from the Presque Isle Cultures, Presque Isle, PA and stored at 4 degrees Celsius. Brain Heart Infusion (BHI) broth (Becton Dickinson, Cockeysville, MD) tubes were prepared according to manufacturer's instructions. Each individual bacterium was inoculated into 10 mL BHI broth and incubated at 37 degrees Celsius overnight. *C. perfringes* was cultured in BHI tubes under anaerobic conditions. BHI plates were obtained from the Presque Isle Company, Presque Isle, PA.

Preparation of EEP

Propolis was obtained (Twin Laboratories Inc., Ronkonkoma, NY) in 500 mg tablet form containing no additives or preservatives. An individual tablet was ground into powder and then dissolved into 5 mL 70% ethanol to give a 100 mg/mL ethanol tincture stock solution. The concentration of propolis used, 1 mg/mL final concentration, was chosen based on studies performed by Mirzoeva,

Grishanin and Calder (13). The tincture was stored at 4 degrees Celsius and used for all future propolis experiments.

Antimicrobial assay

An overnight culture of each bacterium was prepared. To evaluate the inhibitory effects of propolis for each bacterium, four 10 mL BHI tubes were used. Three BHI tubes were used as controls. One BHI tube remained uninoculated, another BHI tube was inoculated with 100 uL of the specified bacterium and the third BHI tube was inoculated with propolis tincture (1 mg/mL final concentration) only. The fourth BHI tube was inoculated with 100 uL of the specified bacterium and propolis tincture (1 mg/mL final concentration). The tubes were incubated for 24 hours at 37 degrees Celsius and checked for bacterial growth. If a bacterium exhibited no growth in the presence of 1 mg/mL propolis, a sample of the culture was plated on a BHI agar plate and incubated at 37 degrees Celsius. After 24 hours, the BHI agar plate was checked for bacterial growth.

Results

Table I shows the results of the effect of EEP on all fourteen strains of bacteria. Only three of the fourteen bacteria showed any inhibitory growth in the presence of 1 mg/mL propolis; these bacteria included *Serratia marscesens*, *Staphylococcus aureus* and *Streptococcus pyogenes*. Once the propolis treated bacteria were removed from the propolis extract and plated, all three of these organisms exhibited growth. All other bacteria were capable of growth in the presence of 1 mg/mL propolis.

Table I. The effect of propolis on the growth of selected bacteria.

Bacteria	Growth in 1 mg/mL Propolis*	Bacteriostatic Activity With propolis*	Bactericidal Activity with propolis*
<i>Bacillus cereus</i>	+	--	--
<i>Clostridium perfringes</i>	+	--	--
<i>Escherichia coli</i>	+	--	--
<i>Klebsiella pneumoniae</i>	+	--	--
<i>Listeria monocytogenes</i>	+	--	--
<i>Mycobacterium smegmatis</i>	+	--	--
<i>Neisseria subflava</i>	+	--	--
<i>Pseudomonas aeruginosa</i>	+	--	--
<i>Salmonella typhimurium</i>	+	--	--
<i>Serratia marcescens</i>	--	+	--
<i>Shigella dysenteriae</i>	+	--	--
<i>Staphylococcus aureus</i>	--	+	--
<i>Staphylococcus epidermidis</i>	+	--	--
<i>Streptococcus pyogenes</i>	--	+	--

*Ethanol extract of propolis at a concentration of 1 mg/mL.

All uninoculated control tubes showed no bacterial growth. The propolis only controls were also negative for bacterial growth. Growth in BHI broth of all bacteria tested was positive.

Discussion

In this study we investigated the effect of 1 mg/mL propolis on the growth of fourteen bacterial species. Of the bacteria tested, propolis exhibited a bacteriostatic effect on only *S. aureus*, *S. pyogenes* and *S. marcescens*, but did not exhibit a bactericidal effect on any of the bacteria tested.

Our results of an inhibitory effect of propolis are in agreement with previous studies that have been done on *S. aureus* (6,7,8,11,13,15,16). Prior studies had also shown propolis to have an inhibitory effect on *S. pyogenes*, but the study did not state if the effects were bacteriostatic or bactericidal (7). Propolis has been shown to have anti-bacterial effects on *E. coli* (results contradictory in the literature), *K. pneumoniae*, *L. monocytogenes*, *P. aeruginosa* and *S. dysenteriae* (6,7,9,11,13). We found propolis to have no antibacterial activity against these bacteria.

Earlier studies have suggested that propolis has more anti-bacterial effects on Gram positive bacteria than Gram negative bacteria, but more recent studies suggest that the anti-bacterial effect of propolis is species dependent. Of the fourteen bacteria tested in our study, propolis exhibited an antibacterial effect on *Staphylococcus aureus* and *Streptococcus pyogenes*, which are both Gram positive cocci and *Serratia marscesens* which is a Gram negative rod. Propolis had no anti-bacterial effect on the remaining eleven bacteria that were tested in our study. The morphology of these bacteria tested for which propolis had no effect included: Gram positive rods, Gram negative rods, Gram positive cocci, Gram negative cocci, and acid-fast bacteria. We were unable to make a conclusion as to whether propolis was species dependent or whether it exhibited greater effects on Gram positive bacteria with our limited results.

We found no previous studies that have examined the effects of propolis on *B. cereus*, *C. perfringes*, *M. smegmatis*, *N. subflava*, *S. typhimurium* or *S. marscesens*. We found no effect of propolis on these bacteria except for *S. marscesens*, for which a bacteriostatic effect was observed.

From our results, we have concluded that the propolis tested had little or no effect on most bacteria. Since propolis showed only bacteriostatic activities and no bactericidal activities, we feel that propolis does not make an effective antibiotic under the conditions in this study.

There are several limitations in this propolis study. Because bees use varying sources of plant exudates, depending upon region, the chemical composition of propolis varies greatly amongst manufacturers. This makes it difficult to

determine a general conclusion about the antibacterial effects of all propolis (6,10,11,12,16). Also, there are no FDA imposed standards or dosage recommendations for the manufacture or the usage of propolis. Therefore, many propolis studies have used varying sources of propolis, with no chemical analysis of the composition making it difficult to repeat the studies.

In future studies, a chemical analysis of all propolis sources is needed before doing any legitimate research on propolis. Additionally, FDA imposed guidelines need to be set on propolis composition and dosage for retail sale. Also, more research is needed to test propolis' synergistic effect with other antibiotics. Previous studies have shown propolis to have a synergistic effect when taken with certain antibiotics (13,15). There is a great necessity for new, safe and effective antibiotics and propolis' synergistic effect could be of great importance with the growing number of antibiotic resistant bacterial diseases.

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