APPENDIX B

B-1 THE ANALYSIS PROGRAM

The program was structured to isolate and compare phrases of variants according to the following conditions: the number of sections, the number of phrases, the length of each phrase, the time signature, and the key signature. In order to understand how the phrases were compared and results were obtained, some of the underlying challenges will be described.

Number of Sections

When first conceptualizing the analysis program, it was decided to analyze only four phrase variants and reserve the remainder for future processing. Then, after the collection had expanded, and all the variants were reviewed, it seemed prudent to analyze all the variants, keeping track of the section of the variant in which the phrase was found. It had been observed that most of the sections in multi-section variants were the same as sections in other variants or as single-section variants. For example, the tune of the marriage formula verse in different variants is often the "Mulberry Bush" (#30) tune. There are 56 multi-section variants whose sections needed to be included in the program that compared all of the phrases. In the encoding program, each section ended with a double bar ("//") and there was a double bar at the end of the variant as well. The section number was added to the end of each phrase pattern as it was extracted and stored for further processing.

Number of Phrases

The majority of variants or sections contain 4-phrase melodies. There are 53 variants that contain from two to six phrases. A few variants, e.g., variants of "Oats, Peas, Beans" (#32) from the MUN collection, were sung straight through, with much repetition of pairs or sets of phrases. These were

encoded in smaller sections according to the structure of the musical and textual similarities to other variants, so that their phrases could be compared with phrases of other variants. In a few variants in which the sections were fragments of other melodies, arbitrary decisions were made regarding the number of phrases for that section. The analysis program can accommodate any number of phrases.

Length of Each Phrase

The length of each phrase may seem like it would be a simple matter to determine. However, one cannot always rely on the printed versions or on the way the verse lines are formatted. Generally, though, there was considerable consistency in the metric accents and rhythms in the majority of variants found in different publications. As a first consideration, each phrase needs to contain a minimum of two measures. The majority of variants do contain four lines of two measure phrases each. The inconsistencies occur, for example, when a melody is published or transcribed from oral tradition in two-measure phrases in some variants or four-measure phrases in other variants. A good example is in the variants of "Green Gravel" (#13), variants 3.A-D, where changes in time signatures and phrase lengths have been made, as noted. Other interesting melodies are those for "Three Knights from Spain" (#53) and the "Keys of Canterbury" (#23). The inconsistencies in the latter variants are in the length of the anacrusis, and therefore in the position of the bar lines, not to mention the time signature variations among the variants of these two singing games. It is very important to know the variant melodies of the collection well enough so that the metric and rhythmic elements are consistently represented in notation for encoding and then analysis purposes. Then, of course, melodies transcribed from tape also need to meet the same criteria.

Time Signatures

As alluded to above, the time signatures of variants first need to have consistent metric accents and rhythmic values in order that the extraction of phrases and their comparison will yield meaningful results. The greatest challenge, however, was to determine how to compare variants of melodies that were in different time signatures. After studying the tabulated transcriptions of variants of many melodies, it became clear that pitches on the main stressed beats of each measure were generally the same: that is, pitches on beats 1 and 2 in 2/4 metre, beats 1 and 3 in 4/4 metre, and beats 1 and 4 in 6/8 metre were comparable between variants. For phrases in 3/4 metre, it was beat 3 that was uniformly comparable to the second stressed beat of the other time signatures. Figure 8 illustrates the beats of pitches from each measure in each time signature that were designated in each phrase to create a pattern that could be compared with other patterns:

2/4	Beats	1	2
4/4	Beats	1	3
6/8	Beats	1	4
3/4	Beats	1	3

FIGURE 8. Beats of pitches designated in a measure of each Time Signature for comparison of patterns.

In the event that the above plan would reduce the pattern to too few notes for meaningful comparison, 4 pitches were first designated in each measure, as in Figure 9 to be saved for future processing:

2/4	Beats	1	&	2	&
4/4	Beats	1	2	3	4
6/8	Beats	1	3	4	6
3/4	**Beats**	**1**	**2**	**3**	**&**

FIGURE 9. Broader plan of designated beats of pitches in a measure of each Time Signature.

In addition, a whole measure of the anacrusis pitches was designated on the plans of Figures 8 and 9 to provide space for those anacrusis that contained more than one pitch.

Key Signatures

In transcription, the melodies of all the variants were written to end on **G4** (the **G** above middle **C**) to enable the phrases of all the melodies to be compared. The one exception to this is in some of the "King William" (#24) variants that end on **D4**, but that are "obviously" in **G** major. The variants of "Dame Get Up and Bake Your Pies" (#6) end on **G4**, but have two flats in the key signature for the minor key, as has the variant of this melody in Mun's variant of "Silly Old Man" (#49, 2.A)

Encoding Program

In the data for each variant, individual lines (or Information "Cards") were entered to give the "TITLES" of the source(s), "Another" variant known to be similar, "Bibliographical" comments, the "FORM" of the melody, "GAME" description, the beginning measure of the marriage formula, the beat and measure of the last pitch of each "PHRASE," separated by commas, and the title of the variant if it was "OTHER" than the generic one of that singing game. All of this information can be used for additional study, for example, of the "FORMS" or the "GAMES," and so on, of the collection.

For each pitch, four codes were encoded: letter name in capital letters, accidental (#,b, or N), the octave (e.g., middle **C** to **B** above is octave 4, as illustrated in Figure 1. a), Octave Designation for Range of Pitches, and a letter for the duration (W, H, Q etc.). Bar lines (/) were also entered at the appropriate places, and a double bar entered at the end of the variant or section.

OUTPUT

There were three stages in the analysis program to produce the final results.

First the pitches of each phrase were extracted and put in a file or table for its phrasal position. To find the end of each phrase, the program checked the "Phrase Card" for the measure and beat of the last pitch in the phrase, then searched the data to pick up all the pitches of the phrase and stored them in the appropriate "file" or table. All the pitches of each first phrase were stored in a PHRASE 1 file, then pitches of second phrases were stored in a PHRASE 2 file. At the end of the set of pitches for each phrase, the time signature and variant number were added to aid in further processing. All this data was printed out.

Second, the program reduced the durations of pitches of all the phrases to a "common denominator" as illustrated in Figure 9 above, for each time signature, and printed out this data as STRB1, STRB2, and so on for each phrasal position.

Third, from this data, pitches were extracted according to the plan of Figure 8 above to produce a final Output of **Strong Beat Patterns.** In **Strong Beat Patterns,** then, is printed the pitch information of each individual pattern as it was found in the data, followed by the phrase number, then variant number, then section number of each source of this pattern. For example, the output of the first phrase of the first variant in the collection, "A Hunting We Will Go" (#1, 1.A) looks like this, where **G** is the letter name, **N** is the accidental, and **4** is the octave register:

STRONG BEAT PATTERNS:
GN4 BN3 GN4 GN4 OCCUR IN 1,00101A1;1,01101C1;1,01101C3;

Not only does this pattern occur in the first phrase, "1," of "A-Hunting We Will Go" (#1, 1.A), in

the first section, but also in the first phrase of the "Grand Old Duke of York" (#11, 1.C), in sections 1 and 3. (*Note:* the section number is the last number in the output for each pattern and is printed for patterns of all variants, whether single-section or multi-section variants.)

The "Anacrusis" is printed out in a separate output statement in the same format as for the **Strong Beat Patterns**, followed by the same source information. For this variant, it looks like:

> **ANACRUSIS STRONG BEAT PATTERNS:**
> **BN4 OCCUR IN 1,00101A1; followed by a list of 190 additional sources**.

Thus, for two measure phrases, four pitches are printed out, for four measure phrases, eight pitches are printed out for each phrase.

In the output, then, is printed out each **Strong Beat Pattern** as it was found in the data. That means that the program started with the PHRASE 1 file or table, picked up the pitches of the first phrase of the first variant in the data, printed out the information, then continued to search through all PHRASE 1 patterns first, then PHRASE 2 patterns, and so on, in the data for any matches. The source information for those matches was then printed out. In the meantime, the program picked up the pitches of the next PHRASE 1 pattern in the file, looked for matches, printed out the information, and so on. When the PHRASE 1 file was emptied, then the program began to search through all the remaining patterns in the PHRASE 2 file, to continue through all PHRASE files until there were no more PHRASE files or patterns to be found. The output contains a listing, then, of each different phrase pattern with its matches, or, in other words, sources for variants that contain this pattern, beginning with a set of all PHRASE 1 patterns and their matching patterns, then PHRASE 2 patterns, and so on, up to PHRASE 6 patterns. There are 426 different patterns in a total of 1602 phrase patterns that were extracted from the data and compared. These patterns were compared regardless of the number of sections, the number of phrases, the length of each phrase, the time signature and key signature of each variant. (For a more detailed

explanation of the analysis program, see Osborn, 1988a and Osborn-Seyffert, 1989.)

B-2 Interpreting the Output

To determine what are the musical characteristics, generally, and the most common patterns of each phrasal position, it was necessary to sort out the patterns manually by each phrasal position and then to sort the patterns within each phrase by the pitch of the first strong beat. It just was not possible to write a program to do this, as there are too many variables in the output data. For each **Strong Beat Pattern,** I notated the pitches on manuscript paper, then wrote down all the sources listed in the output for that pattern. Then I went on to the next pattern, notated it on a separate piece of paper, with its sources, and so on, putting each pattern that occurred first in PHRASE 1 in its pile of PHRASE 1 patterns, then PHRASE 2 patterns when they occurred first in the output as "stand alone" PHRASE 2 patterns, with their sources, and so on. This resulted in six piles of **Strong Beat Patterns** for six phrasal positions. Within each phrasal position, the patterns were next sorted manually from highest to lowest according to the pitch of the starting note of the first strong beat, then further sorted within each group of patterns that started on the same note, according to whether the pitches in the pattern were all the same, ascending, or descending. Next, the notes of each of the **Strong Beat Patterns** of each phrasal position were written out again in order from highest to lowest starting note, that is, in a range from **G5** to **A3**. A chart was created for each phrasal position to record the total number of times that the pattern was found in all phrasal positions, the number of occurrences as **Itself,** and the number of occurrences in any other phrasal position, up to PHRASE 6. For PHRASE 2 and all other patterns, the recording of information followed the same format. Those patterns that were found in a phrasal position other

than the one being created were recorded as either the **Same As** or **New From** previously recorded PHRASE patterns.

Table 1 presents a summary of this information, the **Number of all Patterns Processed**. In the first column is the **Total** number of patterns processed in each phrasal position. PHRASES 1 and 2 contain the same number of patterns, there are slightly fewer in PHRASES 3 and 4, then there is a sharp decline to the numbers of PHRASE 5, then PHRASE 6 patterns. Next is the number of times a pattern was found as **Itself** in each phrasal position. Next to PHRASE 1 patterns, PHRASE 2 contains the greatest number of patterns processed as itself. PHRASE 3, on the other hand, contains the fewest number of patterns processed as PHRASE 3 patterns, as the majority of its phrases are the **Same As** PHRASE 1 patterns, as seen in the next column. The best example of this repetition is in the variants of the "Mulberry Bush" (#30) tune. In the first column for the pattern **G4 G4 D5 G4**, there is a **Total** of 61 variants that contain this pattern in PHRASE 1, (included in the number in the column **Itself**) as well as the same number of times in PHRASE 3. The latter is included in Table 1 for PHRASE 3 patterns (61/248) that are the **Same As** PHRASE 1 patterns. For PHRASE 3 patterns, then, most of its patterns are the **Same As** PHRASE 1 patterns. In the next set of columns is listed patterns that are **New From** other phrasal positions of variants than the phrasal position being considered. For example, for PHRASE 5 patterns, there are only 10 patterns that were processed as **Itself,** whereas most of its patterns are found in other phrasal positions, that is, a total of 16 patterns that are the **Same As** patterns in PHRASES 1, 2 and 4, and a total of 6 patterns that are **New From** PHRASES 1, 2 and 4 respectively. For PHRASE 6, there is only one pattern of **Itself,** or one that is uniquely a PHRASE 6 pattern. The remaining 20 patterns are derived from patterns in other phrasal positions, as indicated in Table 1.

TABLE 1. Number of all patterns processed

		SAME AS					NEW, FROM			
Total	It-Self	Phrase 1	Phrase 2	Phrase 3	Phrase 4	Phrase 5	Phrase 1	Phrase 2	Phrase 3	Phrase 4
PHRASE 1:										
395	*395*									
PHRASE 2:										
395	**327**	33					35			
PHRASE 3:										
387	**89**	248	3				38	9		
PHRASE 4:										
372	**252**	8	56	4			15	34	3	
PHRASE 5:										
32	**10**	14	2				3	2		1
PHRASE 6:										
21	**1**		5		3	1		4		7
1602	**1074**	303	66	4	3	1	91	49	3	8

Table 2 presents a summary of the **Number of Different Patterns** that occurs in each phrasal position in the entire collection. As in the previous summary for **All Patterns Processed**, for each phrasal position is indicated here the **Total** number of individual patterns that occur in each phrasal position, the number of patterns processed for each phrasal position as **Itself,** then

different patterns that are the **Same As** then **New From** other phrasal positions. What is interesting to note, for example, is that the PHRASE 1 pattern **G4 G4 D5 G4** that is contained in 61 variants (in PHRASES 1 and 3) is only 1 pattern. In this Table 2, it is one of the 127 PHRASE 1 patterns of **Itself**, and one of the 63 PHRASE 3 patterns that are the **Same As** a PHRASE 1 pattern. In addition, beginning with PHRASE 2 patterns, there are columns that indicate patterns that are both the **Same As and New From** previous phrase patterns. (See, for example, the variant sources for **D5, D5, D5, G4** pattern number 58 in Appendix C.

TABLE 2. Number of Different Patterns

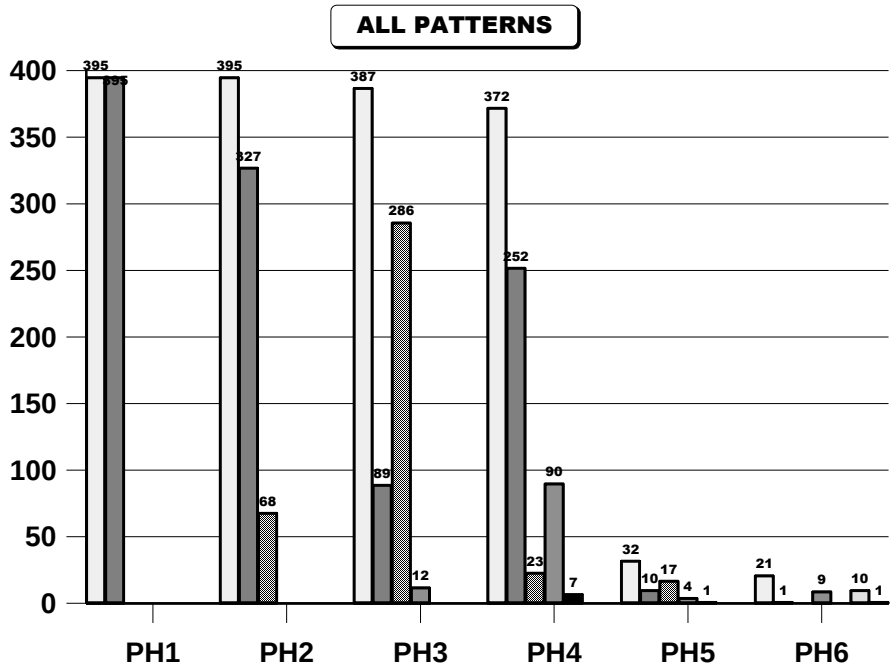
		SAME AS				NEW, FROM				SAME AS & NEW, FROM	
		PHRASE				PHRASE				PHRASE	
Total	It-Self	Phrase 1	Phrase 2	Phrase 3	Phrase 4	Phrase 1	Phrase 2	Phrase 3	Phrase 4	Phrase 1	Phrase 2
PHRASE 1:											
127	***127***										
PHRASE 2:											
162	***129***	*17*				*10*				*6*	
PHRASE 3:											
153	***63***	*67*	*2*			*5*	*8*			*8*	
PHRASE 4:											
145	***96***	*6*	*19*	*4*		*1*	*8*	*2*		*4*	*5*
PHRASE 5:											
28	***10***	*9*	*2*		*1*	*3*	*2*	*1*			
PHRASE 6:											
17	***1***		*5*		*2*		*3*		*6*		
632	***426***	*99*	*28*	*4*	*3*	*19*	*21*	*3*	*6*	*18*	*5*

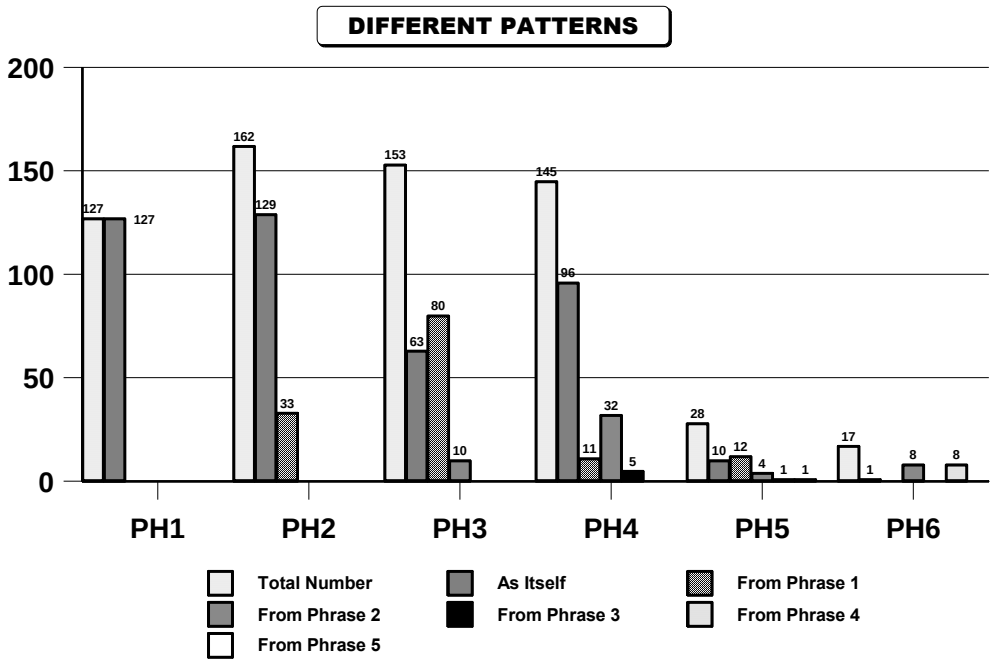
In Tables 3 and 4, the information contained in Tables 1 and 2 is represented in the form of bar graphs to facilitate comparison between **ALL PATTERNS** and **DIFFERENT PATTERNS** that have been processed in each phrasal position.

TABLES 3 AND 4:

TABLE 3 Number of patterns processed in each phrasal position for **ALL PATTERNS.**

TABLE 4 Number of patterns processed in each phrasal position for **DIFFERENT PATTERNS**





B-3 RESULTS

The melodies of all the variants have been analyzed, whether they were in single or multiple sections. The reason for analyzing all the variants was that multi-section variants often contain melodies that are similar to single-section variants. It was necessary to know what all the interconnections between variants are. In all, 1602 phrase patterns were extracted and compared, regardless of the number of sections, the number of phrases, the length of each phrase, the time signature and key signature. A careful study of the results indicates that the plan of reducing the pitches of each phrase and extracting **STRONG BEAT PATTERNS** as indicated in Figure 8 was very successful in grouping variants of the same melody.

A total of 395 variant sections was analyzed. The majority of sections are in four phrases, of two measures each. A total of 53 variant sections contain two phrases (9), three phrases (13), five

phrases (11), or six phrases (20). Therefore, 342, or 87% of the variant sections are 4-phrase variants, of the total of 395 variant sections analysed. [Details of the variant section containing other than four phrases are presented in Figures 2-5.] There is one variant section that contains three measure phrases, "Looby Loo" (#27, 5.A) and 48 variant sections (12% of the total) that contain four measure phrases. [See Figure 1]

Table 5 compares **ALL, DIFFERENT**, and **INDIVIDUAL PATTERNS OF EACH FIRST STRONG BEAT PITCH** ordered from **G5** to **A3**. There is a break-down of patterns of two, three, and four measure phrases for each **FIRST STRONG BEAT PITCH PATTERN**. Also, within each note grouping, there are a number of patterns, for example for **D5**, whose notes are all the same (**DDDD5**), then those whose first two notes are repeated (**DD5**) in ascending (↗)or descending (↘)patterns , or just a single note of that pitch (**D5**), ascending or descending, begins the pattern. It is possible to compare the numbers of patterns of **ALL PATTERNS** with the number of **DIFFERENT PATTERNS** and the number of **INDIVIDUAL PATTERNS**. For example, the total number **of GG4↗** patterns in 2-measure phrases is 247, compared with the number of **DIFFERENT PATTERNS** for **GG4↗**, 39. The **G4 G4 D5 G4** pattern is only one of 17 **INDIVIDUAL PATTERNS** that occur for **GG4↗** patterns: The numbers for **ALL PATTERNS** and **DIFFERENT PATTERNS** for each **FIRST STRONG BEAT PITCH** are included in the summaries represented in Tables 1, 2, 3 and 4. The **INDIVIDUAL PATTERNS** are those patterns that are unique, or represented as **Itself** in each phrasal position. The total number of **ALL PATTERNS** for each **STRONG BEAT PITCH** is indicated in the final column**:** **"**TOTALS ALL PATTERNS.**"** For example, for **G5** the number is 37, for **#F5** the number is 2**,** for **E5** the number is 26. Then, beginning with **D5**, patterns are compared in two groups that are either ascending or descending. The "LINE TOTALS" and "SUBTOTALS" are calculated accordingly in

each group. The "TOTAL ALL PATTERNS" is indicated at the top of the section: for **D5**, there is a "TOTAL" of 326 patterns, that is, it is the total number of "ALL PATTERNS", both ascending and descending.

TABLE 5. Number of **ALL**, **DIFFERENT,** and **INDIVIDUAL PATTERNS** of each **FIRST STRONG BEAT PITCH**

PITCH	PATTERNS	MEASURES			LINE TOTALS	SUB TOTALS	TOTALS ALL PATTERNS
		2	3	4			
G5	All	31		6	37	37	37
	Different	22		6	28	28	
	Individual	15		5	20	20	
#F5	All	2			2	2	2
	Different	2			2	2	
	Individual	2			2	2	
E5	All	22		4	26	26	26
	Different	17		4	21	21	
	Individual	14		2	16	16	
DD5↗	All	22		1	23	76	326
	Different	14		1	15	34	
	Individual	5	1	1	7	19	
DDDD5	All	37			37		
	Different	5			5		
	Individual	2			2		
D5↗	All	14		2	16		
	Different	12		2	14		
	Individual	8		2	10		
DD5↘	All	73		54	127	250	
	Different	18		28	46	102	
	Individual	9		19	28	67	

PITCH	PATTERNS	MEASURES			LINE TOTALS	SUB TOTALS	TOTALS ALL PATTERNS
		2	3	4			
D5↘	All	103	1	20	124		
	Different	39	1	16	56		
	Individual	26	1	12	39		
C5↗	All	15		12	27	27	112
	Different	8		11	19	19	
	Individual	5		5	10	10	
C5↘	All	74		11	85	85	
	Different	26		8	34	34	
	Individual	16		8	24	24	
BB↗	All	35			35	51	167
	Different	18			18	27	
	Individual	8			8	16	
B↗	All	14		2	16		
	Different	7		2	9		
	Individual	6		2	8		
BB↘	All	30		21	55	116	
	Different	14		11	25	49	
	Individual	7		8	15	32	
B↘	All	60		5	65		
	Different	19		5	24		
	Individual	14		3	17		
♭ B	All	22			22	22	22
	Different	10			10	10	
	Individual	8			8	8	
AA↗	All	20		2	22	86	256
	Different	11		2	13	38	
	Individual	9		2	11	30	

A↗	All	63		1	64		
	Different	24		1	25		
	Individual	18		1	19		
AA↘	All	80		6	86	170	
	Different	14		3	17	39	
	Individual	9		3	12	31	
A↘	All	79		5	84		
	Different	18		4	22		
	Individual	16		3	19		
GG↗	All	247	3	30	280	443	511
	Different	39	3	27	69	128	
	Individual	17	3	16	36	77	
GGGG	All	34			34		
	Different	6			6		
	Individual	4			4		
G↗	All	113		16	129		
	Different	38		15	53		
	Individual	26		11	37		
GG↘	All	16		5	21	68	
	Different	7		5	12	29	
	Individual	3		4	7	19	
G↘	All	34		13	47		
	Different	12		5	17		
	Individual	9		3	12		
♯F	All	34			34	34	34
	Different	18			18	18	
	Individual	13			13	13	
E	All	28			28	28	28
	Different	15			15	15	
	Individual	13			13	13	

DD↗	All	9			9	56	59
	Different	5			5	27	
	Individual	4			4	20	
D↗	All	47			47		
	Different	22			22		
	Individual	16			16		
DD↘& D	All	3			3	3	
	Different	2			2	2	
	Individual	2			2	2	
BBB3↗	All	10			10	12	20
	Different	3			3	5	
	Individual	2			2	4	
B3↗	All	2			2		
	Different	2			2		
	Individual	2			2		
BB3↘	All	7			7	8	
	Different	1			1	2	
	Individual	1			1	2	
B3↘	All	1			1		
	Different	1			1		
	Individual	1			1		
A3	All	1			1	1	1
	Different	1			1	1	
	Individual	1			1	1	
TOTALS	All	1602					
	Different	632					
	Individual	**426**					

Table 6 presents a more detailed analysis of the **DIFFERENT PATTERNS** (from Table 2). The first column is the heading, **PITCH,** indicating the pitch, G5, of the **FIRST STRONG**

BEAT in a pattern**.** The numbers in the next column indicate the number of measures, **M**, in a phrase, whether there are 2, 3, or 4 measure phrases. Next, the column headings across the top indicate, first, the phrase numbers, PH1, PH2, and so on to PH6 (phrase 6) of a variant, then underneath is the phrase number (PH2) or (Ph5) in which the pattern occurs and its frequency, whether it is **INDIVIDUAL (Iself), the** Same As**, New From, or Same As and New From** patterns found in subsequent phrasal positions, e.g., PH2, or PH5, and so on. In Table 2, the total number of patterns only in the four categories, **INDIVIDUAL (Itself)**, **Same As**, **New From**, and **Same As and New From** was tabulated. In Table 6 is a complete listing by each phrasal position of the distribution of patterns that is presented for each pattern in Appendix C. In Table 6, starting with **G5,** compare the number of patterns of **Itself**, or **INDIVIDUAL PATTERNS** in each phrasal position, with the actual note patterns in Appendix C, beginning with pattern number 1.

TABLE 6. INDIVIDUAL and **DIFFERENT PATTERNS** of each phrasal position of each **FIRST STRONG BEAT PITCH**

Pitch	*M*	*PH 1*	*PH 2*		*PH 3*			*PH 4*				*PH 5*				*PH 6*		
			Ind	*From PH1*	*Ind*	*From PH1*	*From PH2*	*Ind*	*From PH1*	*From PH2*	*From PH3*	*Ind*	*From PH1*	*From PH2*	*From PH4*	*Ind*	*From PH2*	*From PH4*
G5	2 4	3 1	3 1		5 2	2	1	4	1	1	1 1	1	1					
♯F5	2							2										
E5	2 4	2	2 1		4			6 1		1 1							1	2
DD5 ↗	2 3 4	5	1	1 1	1	5			1				1					
DDDD5	2	1		1	1	1							1					
D5 ↗	2 4	3	2 1		3	2	1			1		1						
DD5 ↘	2 4	5 6	1 5	1 2 1	2 1	3 1 3		1 6	2	1 1 2		1						1

D5 ↘	2 3 4	5 7	6 3	1 1 1	2	3 2 2	1	13 1 1	1	1 1		1	1		1			1
C5 ↗	2 4	1 2	3	1 1	1 1		1	1		2 1	1		1			1	1	
C5 ↘	2 4	2	7 5	1	1	1 1	1	6 2		1		1		1			2	11
BB ↗	2	3	3	1	2	2 1	1				1		1	1			1	1
																		(From PH 5)
B ↗	2 4	1	3		1 1	1	1	1 1										
BB ↘	2 4	5 3	2	1 1	2	2 2 1	1		1			3	1					
B ↘	2 4	4 1	5 1	1		3 1		5 1							1		1	
♭B	2	2	3			2		3										
AA ↗	2 4	2	7 1	1			1	1										
A ↗	2 4	1	9	1	3 1			4		3 1		1					1	
AA ↘	2 4	1	7	1	2			1 1		1 2							1	
A ↘	2 4		3		3			13		1	1							1
GG ↗	2 3 4	13 1 5	2 1 5	1 41 1	2 1 5	12 3		1	1 2	3 1			3	1				
G ↗	2 4	7 3	14 3	2	2 2	3 1 2	1	3 2	1	2	1	1	1 1	1				
GGGG	2	3			1	1 1												
GG ↘	2 4	3 2	1	1	1	2 1 1												
G ↘	2 4	5 2	1 1	1	1	1 1 1		2		1								
#F	2	1	5	1	2	1		5	1	2								
E	2	2	4	1	3			4		1								
DD ↗	2	2				1		1										
DDDD	2	1																
D ↗	2	8	4		1	6		3										
DD ↘	2		1															

D↘	*2*	*1*																
BBB3↗	*2*	*1*			*1*	*1*												
B3↗	*2*	*1*			*1*													
BBB3↘	*2*		*1*															
B3↘	*2*				*1*													
A3	*2*		*1*															
TOTALS		*127*	*129*	*17/10/6*	*63*	*67/5/8*	*2 8*	*96*	*6/1/4*	*19/8/5*	*4 2*	*10*	*9 3*	*2 2*	*1 1*	*1*	*5 3*	*2 6*

Table 7 presents a list of the **TOTAL NUMBER OF PATTERNS** ordered by **FIRST STRONG BEAT PITCH** from **G5** to **A3** for **ALL PATTERNS**, **DIFFERENT PATTERNS**, and **INDIVIDUAL PATTERNS**. Those first strong beat pitches that have the greatest number of patterns have been ranked from 1 to 7, and percentages indicated of the total number of patterns for each set. The greatest number of patterns of **ALL PATTERNS** is from **G↗**, then **D5↘, A↘, B↘, A↗, C5↘,** and **D5↗.** The rankings for **DIFFERENT** and **INDIVIDUAL PATTERNS** are the same except that patterns in the 3rd and 4th ranks (e.g. **A↘** and **B↗**) are switched to **B↘** and **A↘**, and 6th and 7th positions are varied between **DIFFERENT** and **INDIVIDUAL PATTERNS**. For **ALL PATTERNS** the greatest number of patterns occurring for the 7 highest ranked **FIRST STRONG BEAT PITCHES** comprises 76.4% of the total number of patterns in the collection. For **DIFFERENT** and **INDIVIDUAL PATTERNS**, the percentage of patterns in the top seven positions is 67.3% and 65.9% respectively (only one of the percentages in the tied rankings was included in these totals). Therefore, patterns of the **FIRST STRONG BEAT PITCHES** ranked here comprise a large majority of patterns in the collection.

TABLE 7. Total number of patterns ordered by **FIRST STRONG BEAT PITCH**

ALL PATTERNS				*DIFFERENT PATTERNS*			*INDIVIDUAL PATTERNS*		
% of 1602 Patterns	*Rank*	*Total*	*Pitch*	*Diff*	*Rank*	*% of 632 Patterns*	*Ind*	*Rank*	*% of 426 Patterns*
		37	G5	28	7		20	7	4.7
		2	♯F5	2			2		
		26	E5	21			16		
4.7	7	76	D5 ↗	34	6	5.4	19		
15.6	2	250	D5 ↘	102	2	16.2	67	2	15.7
		27	C5 ↗	19			10		
5.3	6	85	C5 ↘	34	6	5.4	24	6	5.6
		51	B4 ↗	27			16		
7.2	4	116	B4 ↘	49	3	7.8	32	3	7.5
		22	♭B4	10			8		
5.4	5	86	A4 ↗	38	5	6	30	5	7
10.6	3	170	A4 ↘	39	4	6.2	31	4	7.3
27.6	1	443	G4 ↗	128	1	20.3	77	1	18.1
		68	G4 ↘	29	7	4.6	19		
		34	♯F4	18			13		
		28	E4	15			13		
		56	D4 ↗	27			20	7	4.7
		3	D4 ↘	2			2		
		12	B3 ↗	5			4		
		8	B3 ↘	2			2		
		1	A3	1			1		

Table 8 presents the **GREATEST DISTRIBUTION OF PATTERNS BY PHRASAL POSITION** for the seven highest ranking numbers of patterns of **ALL PATTERNS** as compared with **DIFFERENT** and **INDIVIDUAL PATTERNS** that were summarized in Table 7. Note that **Pitch***, the starting pitch of each pattern, is listed in the same order for both columns, but the rank of the pitch in the **DIFFERENT** and **INDIVIDUAL PATTERNS** is not in the same order, from 1 to 7. The information is presented in this order to facilitate a comparison between the three different sets of patterns. The numbers for each phrasal position only represent the highest numbers of patterns for that pitch, to indicate the most common number of patterns in each phrasal position. What is clear about the distribution of the patterns in general, is the greatest number of patterns from **G4↗**, as well as from **D5↘**, that occur for PHRASES 1 and 3, and more particularly, for **D5↘** for PHRASE 4. With the exception of patterns from **B4↘**, the greatest numbers of patterns from the remaining pitches occur in PHRASES 2 and 4. For PHRASES 1 and 3, the patterns of the seventh ranked pitch, **D5↗**, occur rather frequently in **ALL PATTERNS** as well. From the rankings in Table 7, ranks 6 and 7 of the **DIFFERENT** and **INDIVIDUAL PATTERNS** occur for a mixture of **FIRST STRONG BEAT** patterns. These are listed in Table 8 as well.

TABLE 8. Greater distribution of patterns by phrasal position

ALL PATTERNS						DIFFERENT PATTERNS						INDIVIDUAL PATTERNS					
		PHRASE						PHRASE						PHRASE			
Rank	**Pitch***	**1**	**2**	**3**	**4**	**Rank**	**Pitch***	**1**	**2**	**3**	**4**	**Rank**	**Pitch***	**1**	**2**	**3**	**4**
1	**G4↗**	190	62	155		1	**G4↗**	32	34	37	17	1	**G4↗**	32	25	13	6
2	**D5↘**	52	40	56	97	2	**D5↘**	23	22	19	31	2	**D5↘**	23	15	5	22
3	**A4↘**		77		79	4	**A4↘**		11		19	4	**A4↘**		10		15
4	**B4↘**	31	21	23	33	3	**B4↘**	13	11	11	7	3	**B4↘**	13	8	2	6
5	**A4↗**		47		29	5	**A4↗**		19		9	5	**A4↗**		17		5
6	**C5↘**		38		25	6	**C5↘ and D5↗**	9	13	14	9	6	**C5↘**		12		8
7	**D5↗**	25		36		7	**G4↘**	12		9		7	**G5 and D4↗**	11		7	

*The pitches in these columns are the same, for ranking 1–6, but the Rank order in each column is different.

The Most Frequently Occurring Patterns

To obtain an overview of the most frequently occurring patterns of those ranked in Table 8, a final chart has been created in Table 9. It contains the number of **INDIVIDUAL PATTERNS** as well as the number of **ALL** the patterns of variants for each phrasal position for the seven highest ranked numbers of patterns according to their **FIRST STRONG BEAT PITCH**. For each of these, there is a distribution made for patterns of two, three, and four measure phrases. The

numbers of these **INDIVIDUAL PATTERNS** correspond with those listed in Table 5 for their respective first **STRONG BEAT PITCH**, distributed in Table 9 for each phrasal position. For example, for **GG4↗** patterns, the first ranked, **GG4↗** patterns in two measure phrases occur 13, 2, and 2 times for PHRASES 1, 2, and 3, respectively, for a total of 17 **INDIVIDUAL PATTERNS**. The total number of **ALL PATTERNS** that contain **INDIVIDUAL PATTERNS** is listed to the right to indicate the frequency of these patterns throughout the collection. For example, for **GG4↗** patterns in two measure phrases of **ALL PATTERNS**, there are 118, 13, 110, 2, and 4 patterns in PHRASES 1 to 5 respectively. There is a total of 247 patterns from **GG4↗FIRST STRONG BEAT PITCH** for PHRASES 1 to 5. While the greatest number of patterns is in two measure phrases, it is evident that those in four measure phrases, although much fewer in number, also have a clear presence in the frequency of patterns for particular phrases. The 5- and 6-phrase variants are discussed in Appendix A (Sections A-3iii and A-3iv, respectively). There can be observed the predominantly repetitive phrase structure of these variants that generally contain four measure phrases. In Table 9 their patterns are presented as they occur in the patterns that are ranked by **FIRST STRONG BEAT PITCH**.

TABLE 9. Most frequently occurring patterns of the highest ranked according to **FIRST STRONG BEAT PITCH**

			PHRASE 1		PHRASE 2		PHRASE 3		PHRASE 4		PHRASE 5		PHRASE 6	
Rank	Pitch	Meas	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL
1	G4↗													
	GG	2	13	118	2	13	2	110		2		4		
		3	1	1	1	1	1	1						
		4	5	7	5	7	5	8	1	7		1		
	GGGG	2	3	31			1	3						
	G↗	2	7	29	14	38	2	29	3	16		1		
		4	3	4	3	3	2	4	2	2	1	3		
2	D5↘													
	DD5↘	2	5	21	1	7	2	30	1	15				
		4	6	10	5	18	1	5	6	19	1	1		
	D5↘	2	5	11	6	11	2	18	13	60		2		1
		3							1	1				
		4	7	10	3	4		3	1	2	1	1		
3	A4↘													
	AA↘	2	1	2	7	66			1	11				1
		4			3	11	2	4	1	2				2
	A↘	2							13	66				
		4					3	4		1				
4	B4↘													
	BB↘	2	5	13	2	5		8		1		3		
		4	3	9			2	9			3	3		1
	B↘	2	4	8	5	15		5	5	31				
		4	1	1	1	1		1	1	1		1		
5	A4↗													
	AA↗	2	2	2	7	17		1						
		4			1	1			1	1				
	A↗	2	1	1	9	29	3	3	4	28				
		4					1				1	1		1
6	C5↘	2	2	5	7	31		7	6	22	1	2		7
		4			5	7	1	1	2	3				
7	D5↗													
	DD5↗	2	5	9		2		9		2		1		
		4					1	1						
	DDDD5	2	1	13		3	1	19				2		
	D5↗	2	3	3	3	3	3	7		1				
		4			1	1					1	1		

In Appendix C each **INDIVIDUAL PATTERN** is printed in the order from **G5** to **A3**, transcribed singing games are listed as the pattern from the **STRONG BEAT PATTERN OUTPUT** of the analysis program. For each pattern all the sources in the singing games are listed as the pattern occurs in a phrasal position. As some of the most commonly occurring patterns presented in Table 9 are described next, a context for these can be found, then, in Appendix C, where additional patterns and their sources also can be located.

G4 ↗

As can be observed in Table 9, patterns from this **FIRST STRONG BEAT PITCH** are the most frequently found in the variants of the collection. There are 13 **INDIVIDUAL PATTERNS** for PHRASE 1 beginning on **GG4↗**. The majority of the variants have the same pattern for PHRASE 3 as well. For example, as mentioned above, the **G4 G4 D5 G4** patterns, found in 61 of 118 PHRASE 1 variants beginning on **GG4↗**, is the same as 61 of 110 PHRASE 3 variants. This pattern is the first and third phrases of the "Mulberry Bush" (#30) tune that is sung to variants of that singing game as well as to different types of texts, such as the marriage formula and in sections of multi-sectioned variants for other purposes. The list of sources in Appendix C indicates all the variants that contain this pattern. The most common PHRASE 2 pattern of these variants is **A4 A4 #F4 D4** (in 51 of the 66 variants listed for **AA↘**). The most common patterns for PHRASE 4 are from **A4↘** patterns: **A4 D4 G4 G4** (36 of 66) and **A4 E4 G4 G4** (9 of 66).

Next in the number of patterns are those with the PHRASE 1 pattern **G4 G4 G4 G4**, of which there are 31 in total. These are the variants of "A-hunting" (#1), the "Grand Old Duke" (#11), and so on, whose second phrase begins on either **A4** or **B4**, as mentioned in the Introductions to these singing games. There are 14 variants whose first and, to a lesser degree, third phrase pattern is **G4 G4 G4 D5**, typical of variants of "We Are the English" (#56), and of some

"On the Carpet...Kneel" verses, as in the "Poor Mary" (#38, 2.A) variant.

There are seven **INDIVIDUAL PATTERNS** ascending from **G4** with several variants for each for PHRASES 1 and 3. These include for example, seven variants of "Looby Loo" (#27, 2.A-3.B), pattern **G4 B4 D5 D5.** There are a total of nine variants for the pattern **G4 B4 D5 (B4)**, the second group, consisting of "Jenny Jones" (#19, 1.B), "Old Roger" (#34, 1.D), and "Poor Mary" (#38, 3.A-B) variants, whose melodies are in three different time signatures.

The four measure phrase patterns that begin on **G4↗** are mainly for PHRASES 1, 2, 3, and 4 for "Sally Water" (#47, 5.A-C & 6.A), and a few are for "When I Was a Young Girl" (#57, 4.A). There are other variants in four measure phrases whose patterns begin on **GG4↗**.

D5↘

The most frequently occurring patterns from this whole group are those of Phrase 4, that contains 13 **INDIVIDUAL PATTERNS** with 60 variants. The **D5 C5 G4 G4** pattern occurs in 21 variants of eight singing games (in 2 more, if the next pattern is included), in several variants of "Looby Loo" (#27) and "Round and Round" (#45). The next pattern is **D5 B4 G4 G4** that contains 19 variants of 17 singing games (including the next 2 patterns).

In four measure phrase variants there are two "popular" sets of tunes. For PHRASES 1 and 3 of **DD5↘** patterns there are those that are variants of the **D5 D5 B4 A4 C5 D5 B4 (G4)**, in "Oranges and Lemons" (#37) and for PHRASES 2 and 4, the variants of **D5 D5 B4 G4 A4 A4 G4 G4**, as in the nine variants of five singing games. In the four measure phrase patterns from **D5↘**, six of the ten variants of PHRASE 1 begin with a pattern that is a variant of the basic outline of **D5 B4 D5 B4 D5 E5 C5/A4.**

A4↘

The patterns for PHRASES 2 and 4 that most commonly occur in the "Mulberry Bush" (#30) (**GG↗** patterns for PHRASES 1 and 3) have been mentioned above. That is, for PHRASE 2 in addition to the 51 variants (of 66) of the **A4 A4 #F4 D4** pattern, there are nine variants of the **A4 A4 A4 D4** patterns, seven of which also occur in "Mulberry Bush" variants. Thirty-six PHRASE 4 variants are of the pattern **A4 D4 G4 G4**, with an additional 10 variants of **A4 F♯ G (G)** pattern and nine variants of the **A4 E4 G4 G4** pattern.

B4↘

Variants of the **B4↘** patterns are the more numerous. Of the **B4 G4 #F4 D4** pattern, there are nine variants. Most of these patterns are in PHRASE 4. There are 29 variants of **B4 A4 G4 G4** pattern in 14 singing games. The majority of the patterns of the 13 **BB4↘** patterns in two measure phrases in PHRASE 1 are distributed over only five different patterns. There are five variants of **B4 B4 G4 G4** and four variants of **B4 B4 A4 G4**. All the four measure phrase patterns of **BB4↘** are variants of a basic **B4 B4 A4 G4 B4 B4 A4 (G4).**

A4↗

The preponderance of patterns of this **FIRST STRONG BEAT PITCH** is in PHRASES 2 and 4, particularly from **A4↗**. In PHRASE 2, there are three patterns with 6 or 5 variants each, as **A4 C4 A4 C4**, or **A4 C4 B4 D5** (both from variants of "London Bridge" (#26) and "Hark the Robbers" (#14) and pattern **A4 C4 D5 G4** for PHRASES 2 and 4 for variant of "Girls and Boys" (#10) and "How Many Miles to Babylon" (#15). The greatest number of patterns for PHRASE 4 is 10 patterns based on the **A4 B4 G4 G4** pattern in four singing games. Then there are eight variants

of the **A4 D5 B4 G4** pattern in four singing games. Eleven (11) of the 17 **AA4↗** variants are of the **A4 A4 A4 A4** pattern of PHRASE 2. The variants are from six singing games, particularly of "A-hunting" (#1) and "Grand Old Duke" (#11) variants whose PHRASE 1 pattern is **G4 G4 G4 G4**, mentioned for **G4↗** patterns.

C5↘

In Table 9, it is most obviously the patterns in PHRASES 2 and 4 from **C5** that are the greatest in numbers. In PHRASE 2 there are 18 variants of the **C5 A4 B4 G4** pattern in eight singing games, and five variants of the **C5 C5 A4 A4** pattern in three singing games. The most variants of a PHRASE 4 pattern are 12 of the **C5 #F4 G4 G4** pattern, in six singing games. These PHRASE 4 patterns are all variants of the same tune, as in "Poor Mary" (#38, 1.A).

D5↗

Included in the patterns of **D5↗** are those of the **DDDD5↗** pattern. These occur in 13 variants in Phrase 1 and in 17 variants in PHRASE 3 (14 of these from Phrase 1) in five singing games and in seven more PHRASE 3 variants of two other singing games. The greatest number of patterns is from "Bluebird Bluebird" (#5). There is an additional pattern in PHRASE 3 (**DDDD5**) from two other singing game variants. For the **D5 D5 G5 D5** pattern there are four variants of two singing games that contain this pattern in PHRASES 2 and 3, as "Queen Mary" (#40), and a marriage formula verse of "Sally Water" (#47, 3.A) that contains this pattern in PHRASES 1 and 2. The seven variants of **D5↗** in PHRASE 3 are from seven different singing games.

To condense the information in Table 9, Table 10 includes only he highest ranked number of patterns of **FIRST STRONG BEAT PITCHES** for **ALL, DIFFERENT**, and **INDIVIDUAL PATTERNS** as they occur for each phrasal position.

TABLE 10. The Highest Ranked Number of **FIRST STRONG BEAT PITCH PATTERNS** of Each Phrasal Position

PHRASE 1 **Pitch**	**ALL**	**DIFF**	**IND**	**PHRASE 3** **Pitch**	**ALL**	**DIFF**	**IND**
G4↗	**190**	**32**	32	**G4↗**	**155**	**37**	13
D5↘	52	23	23	**D5↘**	56	19	5
B4↘	31	13	13	**D5↗**	36	14	5
PHRASE 2 **Pitch**	**ALL**	**DIFF**	**IND**	**PHRASE 4** **Pitch**	**ALL**	**DIFF**	**IND**
A4↘	**77**	11	10	**D5↘**	**97**	**31**	22
G4↗	62	**34**	25	**A4↘**	**79**	19	15
A4↗	47	19	17	**B4↘**	33	7	6
D5↘	40	22	15				

In Table 7 the ranking was based on the total number of patterns of each **FIRST STRONG BEAT PITCH**. In Table 10, the order is based on the total number of patterns of each **PITCH** within each phrasal position. The order in each phrasal position is the same as the ranked order in Table 8, except in PHRASE 2: there are more patterns for **A4↘** than **G4↗** for **ALL PATTERNS** in PHRASE 2. As displayed in Table 10, the greater number of **ALL PATTERNS** for PHRASES 1 and 3 is **190** and **155**, respectively, from **G4↗ FIRST STRONG BEAT PITCH**, followed by **97** from D5↘, then **79** from **A4↘** in PHRASE 4, then **77** from **A4↘** in PHRASE 2.

The greatest number of **DIFFERENT PATTERNS** in the collection are from **FIRST STRONG BEAT PITCH** G4↗ in PHRASES 3, 2, and 1, that is **37**, **34**, and **32** patterns, respectively followed by **31** patterns in PHRASE 4. It is the number of **DIFFERENT**

PATTERNS in each phrasal position and their characteristics that are perhaps more significant than the total number of variants (**ALL PATTERNS**) of each pattern. The latter numbers (for **ALL PATTERNS**) contain the results of the analysis of the song materials that are in the present collection. The materials represent the traditions of central and of eastern Canada as found in oral tradition to the mid-1970s, and in sources printed in Great Britain before World War II. More extensive research in the MUN archive would be necessary to present a broader view of the tradition there. For study and teaching purposes, it is fascinating to observe the infinite variety of melodic embellishment that occurs around the framework that these patterns represent and how these patterns are realised in different time signatures throughout the variants of the collection.