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NOTES ON THE SONG SERIES OF A HERMIT THRUSH IN THE YUKON

BY ANNE HINSHAW WING

A Hermit Thrush, *Hylocichla guttata*, sang in the forest-edge near our camp beside the Teslin river at a point called Johnson's Crossing, Yukon Territory. I listened to its singing whenever possible during the latter half of June, the whole of July, and the first part of August, 1948.

The thrush was a singer of the twilight hours and might be heard for several hours in the evening and early morning and also at other times on cloudy days. Sometimes it sang at so great a distance that the songs were heard only faintly. At other times it sang near by, and the songs were loud and clear. I rarely heard it as late as 11 p. m., although the Olive-backed Thrush sang at midnight. Ordinarily the last song of the Hermit was heard before 10:30 p. m. The singing was often heard about 1:00 a. m. and continued until about 6:00 a. m.

Twilight hours are many in the Arctic, of course, the sunset fading very slowly, the dawn a long, drawn-out affair, and the summer night in June too light at midnight to admit of stars.

I heard it first on the evening of June 21, 1948, soon after our arrival. Between 8:30 and 10:30 p. m. I listened to it, meanwhile working over a pencilled record of the songs heard. It was not easy, for changes of pitch were rapid, and no one song was sung twice in succession. This made it hard to hold a theme in mind long enough to write it down; so I made sure of one or two notes in a song, then changed with the bird to another song, and so forth, until all songs had been made as complete and as accurate as possible.

There were five separate songs, four of which I wrote down as brief melodies, and the fifth as a single note, apparently the opening note of a song too weak for my ear to hear in full. The songs were separated by pauses, a minute more or less in duration and seemingly equal, although no data were gathered on this point. There was a continual change in the order in which the songs were sung, the song to be heard next being unpredictable. On a later evening a count was made of more than 100 successive songs, noting the order in which they occurred. This material is given in a subsequent paragraph.

In discussing the songs I shall call each song by the name of the note or pitch with which it opens. Thus the songs are distinguished by the titles Song B, Song F, Song G sharp, and Song A sharp. The opening note or basal note of each song was long and clear and of greater volume than the succeeding notes which were more rapid and higher in pitch. Upon this basal note the rest of the song was built in the form of harmonizing arpeggios. The Hermit's tone quality was rich and vibrant, the sound carrying a considerable distance. When the bird was singing far away, the song that came most clearly to the ear was that starting on the lowest pitch, Song B. Song D contained more notes than I have shown in the accompanying score, although I believe that all pitches have been represented. The bird alternated pitches so rapidly in this song that to determine the order in which they were sung, the number of times each pitch was heard, and whether the song was always sung in just the same manner was very difficult. Sometimes Song F and Song G sharp were heard to contain additional, rapidly sung intervals like those indicated. However, in no song was the opening note ever repeated or seemingly changed in length or relative volume.

These songs have been examined for evidences of the use of the pentatonic scale of primitive music. This five-toned scale was one of the earliest divisions of the octave in the development of human

music and occurred in ancient Chinese music as far back as the eleventh century B. C. (Tapper and Goetschius, 'Essentials of Music History,' 1917). It still occurs in primitive and semi-civilized music, as well as in folksongs of many nations. Schuyler Mathews wrote of the occurrence of the pentatonic scale in the Hermit Thrush song ('Field Book

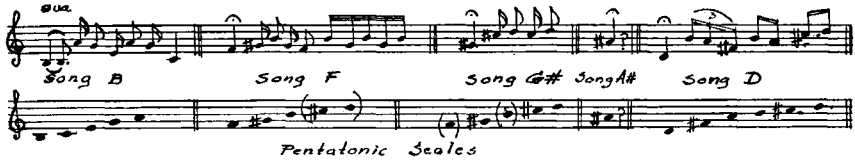

FIGURE 1. Songs of the Hermit Thrush are shown in the first score. In the second score, beneath each song is shown the *pentatonic* or five-toned scale upon which the song is based. Song A sharp (A ♯) is shown with only one note, the other notes having been too faint to determine. The pentatonic scale of Song D contains a sixth tone one octave higher than the opening note D; this sixth tone may be considered as part of another pentatonic scale an octave higher and of the same formation. Songs F and G ♯ contain together only five tones which may be arranged as shown to form one pentatonic scale.

of Wild Birds and Their Music,' 1921). The Hermit Thrush of Johnson's Crossing used the pentatonic scale with a difference. Whereas the whole tone was accounted the smallest permissible interval in the ancient Chinese scale, the bird used the semitone (as between the notes C sharp and D in Song G sharp).

In working out the use of the pentatonic scale by the Hermit Thrush observed, I noted the relationship between Songs F and G sharp and, while these songs contained only three tones each, I combined them to form a pentatonic or five-toned scale beginning on the note F, five tones in all being included in the two songs. Song D actually contained six tones, but the higher D is herein considered as the beginning of a five-toned scale an octave above (Fig. 1).

The reason for the similarity between the scales of human and avian singers seems to be found in the instinctive nature of musical appreciation. "The historic process of scale-invention is, of course, unconscious. The selection of tones seems to be controlled primarily by an instinctive perception of their harmonic relations to the starting-tone and to each other . . ." (Century Dictionary, 1914 ed.). No measurements were made of the frequencies used by the bird studied at Johnson's Crossing, and it is not known whether there was any deviation from the *exact* or *pure scale* (*not* the *tempered scale* of the piano and other instruments of fixed pitch, but the natural scale used by singers and violinists, for example, when unaccompanied by an instrument of fixed pitch). However, I found the pitch and the tone-

relationships satisfactory and as indicated on the accompanying score.

On July 4, notes were made on the order of occurrence of 107 successive renditions of the songs of the Hermit Thrush. Song B is considered as No. 1; Song G sharp, No. 2; Song F, No. 3; Song A sharp No. 4; and Song D, No. 5. The songs came in the following order:

1–2–4–5–1–2–5–1–2–1–3–2–5–3–5–3–4–1–2–5–2–1–5–2–1–2–3–pause while flying–1–2–5–3–2–1–5–2–5–3–1–2–5–3–1–3–5–1–5–3–2–5–1–2–5–3–1–5–3–2–1–2–5–3–1–2–5–4–5–1–2–5–3–5–1–3–1–2–5–2–1–5–2–1–3–4–5–1–2–5–1–3–5–2–1–3–2–1–2–3–5–1–2–1–2–5–3–4–5–3– pause, flew off.

Of the 107 songs in the above count, No. 1 appears 27 times, No. 2 appears 27 times, No. 3 appears 20 times, No. 4 appears 5 times, and No. 5 appears 28 times. To show how apparently unpredictable the next song was, the following table has been prepared giving the songs that followed No. 1 in each instance. I repeat that all pauses between songs sounded alike in length and that the selection of Song No. 1 as a starting point was quite arbitrary.

Sequences	*Number of times heard*
1–2–	2
1–2–3–	1
1–2–3–5–	1
1–2–4–5–	1
1–2–5–	2
1–2–5–2–	2
1–2–5–3–	3
1–2–5–3–2–	1
1–2–5–3–4–2–3–	1
1–2–5–3–5–	1
1–2–5–4–5–	1
1–3–	1
1–3–2–	1
1–3–2–5–3–5–3–4–	1
1–3–4–5–	1
1–3–5–	1
1–3–5–2–	1
1–5–2–	2
1–5–2–5–3–	1
1–5–3–2–	1
1–5–3–2–5–	1

While I have given Song B first place and Song D fifth place, there really was no musical beginning of the series, but only a suggestion of opening and closing songs. The singing went on during a long period, the changes in the order of succession making new effects in harmony and melody. With the possible exception of the single note A sharp, a harmonic relationship could be observed among the songs of the

series. By placing together the other four opening notes B, D, F, and G sharp, as a chord or arpeggio, it will be seen that they form a *diminished seventh* chord or arpeggio. It is interesting to note that two of the completed songs are definitely *major*, the other two *minor*. That is, Song D is unequivocally *major* throughout. Song B is also *major*, although the first two notes, B and the A above it, constitute a minor seventh interval, suggesting a *minor* key; however, as the song progresses there is modulation into a major key, the key of C major. The song is on the whole *major*, or *cheering* in its effect upon the listener. Songs F and G sharp, on the other hand, produce upon the hearer nothing but a *sad* or *minor* effect.

Only the opening or *basal* tone of Song A sharp could be heard clearly, although indistinguishable chiming arpeggios were heard following this tone on one occasion when the bird sang briefly from a nearby tree. However, analysis has shown that each of the other four songs contains tones which form a pentatonic scale with a definite pattern, and it seems reasonable to assume that Song A sharp, if heard more clearly, might also show the tones of a pentatonic scale of similar pattern. Therefore if the song may be supposed to be minor, like the songs F and G sharp, its pentatonic scale would presumably be: A sharp, C sharp, E, F sharp and G, in ascending order. If major, after the manner of the lower pitched songs B and D, its scale would contain the tones A sharp, which is the same tone as B flat, D, F, G and A.

In the course of the series of songs as heard, the following pitches were used, named in ascending order: B, C, D, E, F, F sharp, G, G sharp, A, A sharp, B, C sharp, D. The first B mentioned occurs on the piano as the B at the high end of the octave of which middle C is the lowest note. The final D in the list occurs an octave and three semitones higher than the first B, which was the lowest tone in the series. It will be noted that no D sharp is present. The only significance of such an observation lies in the thought that the missing pitch might be found in the incomplete Song A sharp. (In the accompanying score (Fig. 1) the notes are all shown an octave lower than sung, this fact being remedied by the notation *8va* . . . which places it an octave higher than shown.)

In the Hermit's songs are included a majority of the intervals used by human musicians: diminished second, major second, minor third, major third, major fourth, diminished fifth, major fifth, major sixth, and minor seventh.

College Station, Texas, September 5, 1950.