

REPORT ON THE STRUCTURAL PECULIARITIES OF THE MUSIC.

BY JOHN COMFORT FILLMORE.

IN the spring of 1888, Miss Alice C. Fletcher of the Peabody Museum of American Archæology and Ethnology of Harvard University sent me an Indian song which she had noted down from the singing of the Omahas, asking me some questions concerning its scale. A correspondence ensued which finally resulted in her commissioning me to make a careful scientific study of her collection of Indian Songs, several hundred in number. During the spring and summer of 1891, she also provided me opportunities of hearing many of the songs performed by Indians and of submitting to them my harmonizations of nearly the whole collection of songs.

My principal reliance in this work was on Mr. Francis La Flesche, an Omaha Indian in the service of the Indian Bureau at Washington, D. C. I spent a week with him in Washington, devoting my whole strength to the study of the songs. I afterwards accompanied him to the Omaha Reservation in Nebraska for another week of work. We were fortunate enough to find the tribe assembled in camp for the celebration of their tribal festival. We witnessed their dances, heard their songs, and their devotion and gratitude to Miss Fletcher procured for me the unprecedented favor of a special performance of the Wa-wan (Sacred Calumet) ceremony. This was given at her request, and on her account only, she being the only white person to whom such a concession had ever before been made.

A few weeks later Mr. La Flesche spent a week at my home, at which time we gathered up the loose threads and rounded up our

work as far as possible. To his unwearied patience, intelligence, courtesy and carefulness I owe much; vastly more, indeed, than I can give any adequate idea of in any acknowledgment I can make. Without his devoted assistance, no thorough or complete investigation of the music of his tribe would have been possible. No one else was so thoroughly competent in every way to assist a musician in finding out what needed to be known.

I also desire to acknowledge my obligations to Mr. George Miller, another Omaha whom I met on the Reservation, for his patience in repeatedly singing for me songs which Mr. La Flesche did not know, until I had noted them correctly; to Mr. Noah La Flesche for a similar service in the music for the Indian flageolet, and to Pae-zhae-hoo-ta, Doo-ba-mon-ne and He-tha-ga-he-gae, the three Indians who conducted the Wa-wan ceremony.

In my investigations I have sought to cover the following points:

1. The scales on which the Indian songs are built.
2. The harmonies naturally implied in the melodies of the songs.
3. The tonality of the songs as indicated by melody and harmony combined.
4. Rhythms.
5. Phrasing and motivization.
6. Quality of tone and correctness of intonation.
7. The Indian flageolet; its scale, fingering and capabilities as a musical instrument.

1. *Scales.* My first work on the collection of songs turned over to me was to go over them laboriously, picking out the tones of which each song was composed and arranging them in scale order. I found that a great majority of them were composed of the tones of the pentatonic (five toned) major scale, familiar in old Scotch, Irish, Chinese and other ancient music; *i. e.*, of the tones of our major scale with the fourth and seventh omitted. Some of them employed the corresponding five-toned minor scale. But a very considerable number seemed capricious, in that they employed either the fourth or seventh and omitted one or more of the other regular scale intervals; so that there were among them songs which could be reduced to major or minor scales of four, five, six, seven or eight tones. The minor scale appeared both in its "pure" and "mixed" form; *i. e.*, with a minor or major seventh, the latter being our so-called "harmonic" minor scale. But there remained some very puzzling cases of songs whose tones could not be reduced

to either the major or the minor scale, whether complete or incomplete, because chromatic tones were employed. Such were the "Poogethun" song (No 8 of this collection), where the tones B and G # are introduced, the rest of the song being plainly in the scale of F; the "Taking away the Hunga" (No. 56) where A b is used, the scale being G major, etc. If these tones could have been treated as mere chromatic bye-tones, they would not have caused much difficulty but the A b in No. 56, at least, is an important melodic note; is principal and not accessory. So is the C b in the song No. 32. These tones can easily be accounted for on harmonic grounds, but not by a reference to any known form of scale. But the Indians always sing in unison and never employ harmony. However, I hope I shall be able in the next paragraph to offer considerations which may point the way to the solution of the problem.

2. *Harmony.* Miss Fletcher had informed me of the curious fact that although the Indians never made any attempt at singing in parts, whenever their songs were played for them on a piano or organ, *they were not satisfied without the addition of chords to the melodies.*

This fact seemed to me significant and important. I thought it indicated the presence of a latent harmonic sense which might, unconsciously on their part, be a determining factor in their choice of melody tones. Accordingly I set myself to harmonizing a considerable number of songs, seeking only to employ the natural harmonies implied in the melodies. I then sent those harmonized songs to Miss Fletcher, requesting her to try them on as many Indians as she could, with a view to discovering whether they found my harmonies natural and satisfactory.

The result of the experiment was entirely successful. Whatever chords were natural and satisfactory to me were equally so to them, from which it seems proper to draw the conclusion that the sense of harmony is an innate endowment of human nature, that it is the same for the trained musician and for the untrained primitive man, the difference being purely one of development.

I have myself personally repeated this experiment many times and always with the same result. And since these melodic aberrations to which I have referred are easily and naturally accounted for by reference to their natural harmonic relations, *and in no other way*, I am forced to the conclusion that melody is a product of the natural harmonic sense and that all efforts to reduce primitive mel-

odies to scales without reference to the natural harmonies implied in them must prove futile. I therefore spare myself the useless labor of enumerating all the specific varieties of scale to be found in these songs, regarding it as a wholly irrelevant matter.

The harmonizations given in the songs which accompany this report have all been submitted to Indian criticism, some of them many times, and have been found satisfactory. I have also experimented with different harmonies and have invariably retained those which the Indian ear preferred.

These accepted harmonizations give some curious results. The Indian ear accepts not only the major and minor concords, but the dominant seventh, as shown in most if not all of the songs; the diminished seventh, as shown in the second measure of No. 63 (this chord was distinctly preferred to the dominant seventh in that place); sharp dissonances in the shape of suspensions, whether prepared, as in the twelfth measure of No. 41, or free (*appoggiaturas*) as in the first measure of No. 37 and in numerous other cases. These points cover pretty much the whole ground of modern harmonic structure. In addition to this, some of these melodies as, for example, No. 41, are clearly based on harmonic modulation and some of them, like No. 56 already cited, depend on third or sixth relationships. The chord of $A\flat$ in that song is the chord of the (major) under third of C , in which latter key the song closes, although it begins in G . This latter point, the use of the third and sixth relationships in harmony, is one of the most notable peculiarities of the Modern Romantic School.

Practice of this sort is to be found in Beethoven and in Schubert; more of it in Schumann and in Chopin; most of all in Liszt and Wagner. That some of these primitive melodies, created by a people who never use harmony and who have no musical theory of any kind nor even a musical notation, should be explicable by referring them to a latent perception of these relationships and explicable in no other way, is certainly a surprising fact. It would seem to prove beyond question, if proof had been needed, that these relationships are primary and natural and that modern composers in extending the limits of the traditional harmonic system in which the fifth relationships had reigned supreme have simply discovered and utilized new natural materials and relations.

It seems clear enough that, as we might expect from what we now know, since Helmholtz' epoch-making work, of the complex

nature of single tones, the primitive mind has, from the very first tone of a song, a sort of subconscious perception of harmonic relations and that these relations determine, at least in no small degree, the melodic succession of tones in the song. Whether this subconscious perception includes the undertone series as well as the overtone series, according to the doctrines of Dr. Hugo Riemann and Prof. Arthur von Oettingen, I have not been able conclusively to determine. The only fact which seems to bear on this question is that primitive man, in common with the trained musician, accepts the minor chord (so called) as a satisfactory concord. And this chord, from the point of view of acoustics, is certainly not a concord in the overtone series and is a concord when referred to the undertone series and not otherwise. But my experiments with the Indians have thrown no new light on the problem of the relation of Harmony to Acoustics. It is clear enough that Indian musical composition is due to the impulse to express emotion in melodic and rhythmic forms and that the determining forces are imagination and feeling. Of course this expression of feeling is conditioned on physical laws; but thus far I see no reason to expect, as I once hoped, that the study of primitive music may lead to further discoveries as to how far-reaching those laws may be. The fact may be noted, however, that major keys and major chords predominate in these songs, and that the Indian ear prefers a major chord, as a rule, at the close of a minor song. All of which suggests that, even if there be a subconscious perception of the undertone series, the overtone series predominates over it, in their minds.

It is possible we shall sometime discover that the tones we hear are more complex than even Helmholtz knew; that the undertone series as well as the overtone series is present in every tone, and that "major" and "minor" conceptions are due to the predominance of one or the other, much as quality of tone (*timbre*, *klangfarbe*) is due to the predominance of one or another set of overtones. But this is yet to be conclusively proved.

3. *Tonality.* Before I became convinced that a latent sense of harmony in the aboriginal mind played an important part in determining these melodies, I had found that the question of their tonality was often difficult, not to say impossible to decide from the melody tones alone. A few illustrations will help to make this clear. Song No. 72 (Wae-wa-chee) contains two sharps (F #

and C #). Ordinarily, therefore, we should say that its key note is D. But note the build of the melody. It begins on C # (third space of treble staff) ends on the A below the treble staff and omits the tone G. If it be in the key of D, not only is the fourth of the scale omitted, but the song begins on the leading tone (seventh) of the scale and goes DOWNWARD until it finally ends on the Dominant (fifth). The trained musical ear, at least, cannot but feel that this is a somewhat unnatural beginning. But if it be assumed that the missing scale tone is not G but G #, the case presents no further difficulty. It is natural enough for a melody to begin on the third of the scale and go down. What is more, if we think the song as beginning, in the key of A, there is no difficulty in harmonizing it easily and naturally. Whereas the first part of it can hardly be harmonized in the key of D otherwise than awkwardly and unsatisfactorily, the latter part can be harmonized as well in D as in A, and the Indian ear prefers the ending in D. One would decide the tonality then, not alone from the tones actually employed in the song, but from considering what tone or tones needed to be supplied in order to make a natural and satisfactory harmony. Thus, the question "What scale has this song?" simply resolves itself into the question of harmony. If we can decide on the Tonic chord, the scale will settle itself. And the question of the Tonic chord depends mainly on the harmonic implications of the melody. Scale, I have come to think, is an entirely subordinate matter.

Take No. 67 for further example. It is in the key of A, beyond doubt; yet the leading tone (G #) is nowhere to be found in it, and must be supplied in the harmony.

So I regard No. 17 as in the key of A, although it contains neither the seventh nor the fourth of the scale of A. And No. 19 is in the key of D, although both C # and G are missing. These last two furnish admirable examples of pentatonic scales. It is curious, by the way, to see how many of these songs begin and end on the fifth of the scale, as does No. 17. And many others end on the fifth (among them No. 72, if we end it in D, as the Indian ear prefers it), although they begin on some other interval, perhaps the tonic, as does No. 19. This brings the tonic chord, at the close, into its natural position when made up of three tones only, with none of them doubled. Whether this peculiar ending is due to a dim consciousness in the Indian mind of this natural position of

the tonic chord, it is impossible, of course, to say with the full assurance of certainty. But it is certain that the songs thus harmonized satisfy the Indian ear equally with that of the trained musician. Can this be accounted for otherwise than on the ground of a common perception? I think not. The difference, as it seems to me, is one purely of degree, due to training in the one case, and lack of it in the other.

The examples I have cited might be numerous multiplied if necessary. But they serve to illustrate the point that the question of tonality in these songs is a question to be settled by the help of harmonic considerations and not otherwise. Any reader who is interested will study the songs for himself. For others there is no need to multiply illustrations.

But the case becomes stronger when we come to take into account the melodies which more or less plainly imply modulation. Of these, the beautiful choral No. 41 is the most conspicuous example. The song begins in the key of $1\flat$. There is not a single tone in the melody, except the E in the last measure but one, which is not to be found in the scale of $B\flat$. Yet the course of the melody is such as to force on one the sense of a change of key. It is quite impossible to harmonize it satisfactorily without modulating, especially considering the form of the ending. The harmony I have given to it seems to me to be naturally implied in the melody and satisfactory. I tried numerous experiments on Mr. La Flesche with the harmony of this song, beginning with the sixth measure. His comments would run about thus: "This sounds right to me up to that point; the next part is weak; now it is better,—but it isn't right yet; now it is right." The latter comment was made when I played the harmony as here given. I also tried it on Reservation Indians afterwards with the same result, so that I feel justified in holding this harmony to be entirely natural.

In this song the original key is kept until the fifth measure, in which the first clause ends with the relative minor chord. The next phrase of three measures is in the key of $E\flat$ (sub-dominant), the third measure effecting a transition to the key of F by means of the chord of G (over-third of $E\flat$), followed naturally by the chord of C (dominant in F). The last clause begins in F, modulates to C, in the second measure and closes the period in that key. This key, the major over-second of $B\flat$, the original key-note, would seem to be so remote as to make it impossible to preserve

unity within the limits of a short twelve-measure period. But the melodic flow is so smooth and the harmonic connections so natural that I, at least, do not get from it the impression of anything forced, harsh or unpleasant, nor, do I feel the need of a return to the original tonic. The whole choral impresses me with its beauty, nobility and dignity. Indeed, I know not where to look for a finer musical expression of noble, dignified religious feeling within the limits of the choral.

In No. 45 the principal key is *Ab*, but I found it impossible to harmonize it satisfactorily without introducing the key of the relative minor and of the dominant. It closes in the relative minor; but the Indians prefer the major chord for the final, and it cannot be denied that the form of plagal cadence here given is very beautiful.

No. 56 seems to be an example of change of key within very narrow limits. The first two phrases, comprising only three measures, would seem to be clearly in the key of *G*, while the remaining two phrases, of two measures each, seem to be in the key of *C*, with a modification of the plagal close, the major chord of the under-third being used in place of the sub-dominant.

The Otoe song, No. 47, may well close our list of citations on this subject. In it, we find, at least according to current methods of reckoning modulation, the three keys of *E* minor, *B* minor, and *D* major, the predominant tonality being that of *B* minor. The ending with the dominant chord gives a peculiar feeling of incompleteness; a feeling caused also by the endings of some of the other songs, notably No. 32, which ends with the supertonic chord. This last song is also notable for its employment of the minor chord of the sub-dominant, thus making it a "mixed major" key, as Dr. Moritz Hauptmann aptly named this kind of tonality.

These unusual endings remind one of Schumann; I recall particularly No. 4 of the "*Kreisleriana*," which ends with the chord of *D* major (over-third), the key of the piece being *Bb*. Such endings doubtless serve the requirements of emotional expression and thus used, are, of course, legitimate. No musician, civilized or uncivilized, is under obligation to cut his feelings to fit the theoretical requirements of cadence. He has a right to express his feeling just as it is;—if he can.

4. *Rhythms*. One of the most noticeable rhythmic peculiarities of these songs is the grouping of pulses into measures of different

lengths. Some of them group their pulses in twos or in threes throughout. But many of them have groups of an unequal number of beats. Such are the beautiful Mekasee song, No. 59 (twos and threes), No. 36, also twos and threes, No. 62, threes and fours, and others. No. 74 changes its measures from $\frac{5}{4}$ to $\frac{6}{8}$, the dotted quarter note in the second part and the quarter note in the first part each standing for a drum beat, at the rate of 104 to the minute.

This last song serves also to exemplify the syncopation of which these songs contain numerous examples. The song begins a half-pulse before the drum-beat, and the first measure of five beats is divided into five twos. There is also a syncopation toward the end of the $\frac{6}{8}$ portion. The first measure is syncopated, in that the drum beat comes on the first note of the second phrase, while it comes on the second note of the first phrase, the second phrase being melodically an exact repetition of the first. This song I found very difficult to note down from the singing, its rhythm being extremely complicated.

One of the most striking peculiarities of rhythm is the mixture of twos and threes in the same measure. The Mekasee song, No. 58, has two examples of this in the $\frac{6}{8}$ rhythm where there are two drum-beats in each measure, represented by dotted quarters, while the song has three quarter notes in the measure. This is the same rhythm to be found in the No. 20 of the Mendelssohn "Song without Words," in "Abschied," Op. 82, Schumann and elsewhere in the works of the modern romantic composers. But the Omahas carry this rhythm to the greatest length in the Haethuska songs. The Haethuska dances, as I have seen them, require the double-drum-beat, a strong pulse followed by a weak one. Against this many of the songs have three equal notes or their value. The drum-beat being represented by two eighth notes, with a strong accent on the first, the voice will sing against it now an eighth followed by a quarter, now a quarter followed by an eighth, now three eighths, now a syncopation, the quarter note crossing the drum-beat. Examples of all these rhythmic forms may be found in the Haethuska Song, No. 19, and most of the other Haethuska songs exemplify them more or less. That a primitive people, without any musical notation and without any *theory* of rhythm, should have developed such complicated rhythms seems to me very surprising. I know of no greater rhythmic difficulties anywhere in our modern music than these Omahas have completely at command

in their every-day music. It seems to be as natural and easy for them to beat two and sing three, and that too in all sorts of syn-copation and complex combinations as though they had received the most thorough rhythmical training to be had in any conservatory in the world. Indeed, I suspect that a great majority of conservatory students the world over might have a good deal of difficulty in learning to do what is to the Indians an every-day matter. And if white students of music had to pass an examination in taking down Indian rhythms from hearing them, I fear a good many would come to grief. Rhythm is by far the most elaborately developed element of the Indian music, and in this respect civilized music has not surpassed it, at least in the point of combining dissimilar rhythms.

5. *Phrasing and Motivization.* That larger phase of rhythm which is called *phrasing*, the grouping of measures into phrases and clauses and the correlating them into periods, is represented in these songs in quite as rich variety as is that grouping of pulses which we call measures. We are accustomed to think of the normal phrase as a group of two measures, less frequently of three, but these songs afford numerous examples not only of two- and three-measure phrases but also of four-measure, five measure and even larger phrases. In No. 19, already cited, the first three phrases have four measures each, the fourth has seven; the fifth, sixth and seventh phrases have four measures each and the eighth six.

No. 17 consists of two periods. The first consists of two five-measure phrases and one nine-measure phrase, unless one chooses to divide the latter into a five and a four. (The odd measure at the end is a mere breathing space; as also in No. 19.) The second period has a five- and an eight-measure phrase, or two fives and a three. The former division is perhaps more natural with the harmony I have given it, the final measures seeming to be an integral portion of the long phrase rather than a separate short one.

These two examples are sufficient to show the richness and variety of the grouping in phrases and the correlation of phrases in larger forms which characterize the Omaha songs. No one with the songs before him needs more, to call his attention to the point.

As regards "motivization," the building up of a melody out of modified repetitions of a short melodic phrase which serves as a model (technically a "motive"), Nature seems to have taught these people precisely what our professors of composition teach

their pupils, and with marked success. Not only the two songs I have just cited as examples in phrasing, but almost every song in the collection, employs its first motive as a model and thus secures the prime quality UNITY. They all repeat the motive in modified forms and thus obtain VARIETY, without which Unity becomes mere monotonous uniformity. They all correlate their phrases into clauses; their clauses into periods and the larger ones their periods into two-period "Primary Forms" with a symmetry which is entirely satisfactory.

As for Contrast and Climax, the remaining two essentials of any great Art work, the dimensions of the songs are too small to admit of the former, except as it is included in the variety of the treatment of the motive and of the rhythm; and there seems to be, in most cases at least, a real culmination of interest and of effect, notwithstanding the curious fact that the melodies almost invariably descend in pitch, from the beginning to the end of each period.

That is to say, the fundamental requirements of a work of art are founded in the nature of things and of the human mind and are obeyed as unerringly by these untaught primitive men in their efforts to express emotion in terms of the beautiful as by the best of trained composers. The difference seems to be one of development merely. The Indians produce no long, elaborate musical forms because they have not acquired the power of sustained musical thinking. But their spontaneous expressions of feeling in tones are, within their limits, artistic.

6. *Quality of Tone and Correctness of Intonation in Indian Singing.* That many of the melodies in the collection accompanying this report are beautiful, I think no one will deny. But I think also that the general impression of those who have happened to hear Indians sing is that their songs, as given by themselves, are not beautiful; and I shall be obliged to admit that, in certain important respects, my own impressions confirm those of other observers.

Of sensuous beauty of tone I have heard comparatively little in Indian voices. Nor do I see how it could possibly be attained under the ordinary conditions of Indian singing. Take the Waewachee or the Haethuska dances for example. A half dozen or more men sit in the open air round a large drum, beating it with their utmost force and shouting out war or victory songs at the top of their voices. In the Waewachee songs the women add their

shrill voices at their very loudest and both men and women begin at the highest pitch they can reach. There is a continual interjection of war-whoops from the men, and of shrill cries in imitation of the bird-hawk from women both among the dancers and outside of the circle. In the Haethuska dances the men have strings of sleigh-bells on their legs. All of these noises are symbolic and deeply significant to the Indian, but of course serve only to confuse, if not to repel, the musical sense of the casual white visitor. There is more or less noise and confusion in the camp. The wind perhaps blows hard; it generally does on these rolling prairies. Often another company is singing, dancing and drumming at no great distance. The songs are the expression of excited feeling and the singers are stirred up almost to frenzy. Under such conditions the production of a beautiful quality of vocal tone is physically and morally impossible. The most beautiful natural voices would soon be rendered shrill and harsh by such unrestrained shouting and screeching out of doors in damp or windy weather. Any one who desired to cultivate a beautiful quality of voice would find it impossible for his ear to make nice discriminations in tone quality amidst such a hubbub. Indeed, nobody seems to think of paying any attention to such considerations and the very idea of vocal *cultivation* is, so far as I am aware, foreign to the Indian mind. The qualities which they esteem in a singer's voice are power and penetrating quality. I have heard strong, manly voices among them, and in the Wawan (Calumet) songs, these come out well, lacking much of the shrillness and screechy quality I heard in the war-songs and scalp-songs. But even here, the men sang *forte* and *fortissimo* for hours together, out of doors, in the face of a strong southeast wind, with an accompaniment of big drum and rattles. What chorus is there in the world which could endure such a test, and acquire or preserve a beautiful quality of tone, under such conditions? Or how could beauty of tone even be thought of?

The same conditions which prevent the development of beauty of vocal tone prevent also any nice discrimination as regards pitch. There is in the Indian singing a good deal of inaccuracy of intonation; much less, however, it seems to me, than might reasonably be expected. I have known many eminent singers (soloists) to sharp or flat a good deal under unfavorable circumstances; some otherwise good singers do one or the other habitually; and the best choruses sometimes fall in pitch a full half-tone during the per-

formance of a single song no longer than some of these Indian songs. I do not think these Omahas often varied more than half as much as that from the true pitch in most instances when I heard them, except when they rose to what was meant for an octave at the beginning of the second part of a song. Then they often fell short a semitone. This is saying a good deal when we take into account that the drumming and other noise made so much confusion that it sometimes required very sharp listening on my part to recognize a song with which I was already perfectly familiar. I do not wonder that superficial observers find no melody and no beauty in Indian singing. The melody is covered up and hidden by overpowering noise. It is not always easy to extract the real kernel from the rough husk which surrounds it, and those who go to hear Indian music out of mere curiosity with no desire to penetrate to the core of it may very well find their surface impressions unfavorable. They are looking for what is not there; and what is there of real merit is not to be found without seeking.

But there is another reason why casual hearers of Indian music find nothing in it, and that is that they have not the faintest idea of the meaning and spirit of it. To them it is mere barbaric noise; "all sound and fury, signifying nothing." But the truth is that, to the Indian, many of these songs are the fervid expression of his most sacred beliefs and experiences. The Wawan ceremony is profoundly religious, its symbols are treated with as great reverence as any priest treats the crucifix or the Sacred Host; all phases of religious emotion are embodied in its songs. He who knows, feels and appreciates this, who penetrates so far into the Indian feeling as to be partly oblivious of non-essential accessories, can begin to appreciate the feeling Miss Fletcher expressed to me when she told me that she had never been so powerfully impressed or so profoundly stirred by any music as by the Wawan songs, except by some of the great Wagnerian music dramas. This Indian music is the true and natural expression of genuine emotion; much of it profound, much of it high and ennobling; and the better it is known the more this will be seen.

If an appreciative and intelligent listener like Miss Fletcher can speak with such enthusiasm of Indian music, notwithstanding the deficiencies of Indian performance on the side of sensuous beauty, much more ought it to make its natural impression when given with a beautiful quality of tone, whether by singers or orchestral

instruments or by both together, as I hope it will be some day. The music, as such, doubtless will make its impression. Whether it can arouse such enthusiasm as Miss Fletcher's, when taken out of the religious ceremony to which it belongs, given by people who do not sympathize with the feeling which gave it birth and wholly separated from its natural accessories, remains to be seen. But these beautiful chorals will certainly always remain the expression of genuine religious feeling and I doubt not their merit will be recognized.

7. *The Indian Flageolet.* This instrument is made of red cedar, ornamented with lead run into grooves. The specimen now in my possession is twenty-four and one-half inches long. It is bored, as evenly as possible from the lower end to a length of about seventeen and one fourth inches. The upper end is bored down six and one-half inches. Each opening contains a narrow slit close to the partition between the long and short bores. The partition is made smooth on the top, a thin plate of metal is laid over it, having a long opening and a rider is tied down over the plate so that a thin sheet of air is blown through the narrow space between the partition and the plate into the longer bore, the surplus air escaping through a vertical aperture in the rider. The instrument is blown from the end. Its construction is therefore substantially the same as that of a small open organ pipe; for the stream of air blown in at the upper end and passing through the thin passage at the upper side of the partition impinges on the sharp edge or "lip" of the metal plate at the entrance of the long bore and thus sets the column of air in vibration. The diameter of the longer bore is about seven-eighths of an inch and that of the short one at the upper end is less than one-fourth of an inch. Inside it is doubtless larger. Close to the lower end of the flageolet are four small holes circularly arranged, the use of which I have not been able to determine, as they are never stopped. The holes in actual use are six in number. The lowest of these holes is five and five-eighths inches from the lower end of the flageolet and three and three-eighths inches from the circular row of holes near the lower end. The upper (sixth) hole is four and five-eighths inches from the "lip." The six holes are about equidistant each from its neighbors, the distance between each two being a scant inch.

No. 91, a flageolet piece which I transcribed in Nebraska, illustrates somewhat imperfectly the defects of this flageolet as regards

the key relationship of tones. This piece seems to be in the key of F# minor, omitting G#. But the fundamental tone of the flageolet is nearer F than F#. The key relationship of the tones A, B, C#, D# and F# (fifth line) are tolerably correct; but the lower tone being almost a major third lower than the A makes the piece sound very badly out of tune. The upper F, meant for the octave of the fundamental, is about a quarter of a tone sharp. The fundamental is, of course, produced by closing all the six holes with the fingers. The upper F the Indians produce by opening all the holes except the lower one. The true octave of the fundamental, or nearly so, may be obtained by opening the fifth hole only and blowing with considerable pressure. But this I have not seen Indians do. Blowing with less pressure produces the over-fifth of the fundamental. The upper F# is produced by opening the sixth hole only and increasing the wind-pressure. A true minor third (Ab) to the fundamental, or nearly so, is produced by opening the first hole. Opening the first and second holes produces Bb; opening the first three holes produces C, but flat. With the first four holes open we get D; with the first five open, E; with all six open, F, but almost a semi tone sharp. All these values are approximate only. The tones used in this piece (No. 91) are all produced with the first hole closed, except the upper F# which is produced as above described, and excepting, of course, also the fundamental. In producing the A, the second hole only is open; the second and third holes open give B, the second, third and fourth holes open give C#; the second, third, fourth and fifth holes open give D#; all the holes open except the first give F, or E#. It is the fundamental which is most out of tune with the rest. No. 92 illustrates the same points.

I have made, as yet, no attempt to determine accurately the precise vibration ratios of the scale of this flageolet. Such an investigation would be interesting, but has little bearing on the really important relations of the Indian music, since the imperfections of it are plainly due to the limitations, not of the Indian's musical perception, so much as of his scientific knowledge. The flageolet is evidently built "by guess" and only remotely approximates the Indian voice in accuracy of intonation. The really instructive investigations in their music must be made, I think, in their songs, which are not only the natural, free, spontaneous expression of their musical conceptions, wholly unhampered by the defects of a

faultily constructed instrument, but greatly predominate in amount over their instrumental music. We must recollect that they have no theory of music whatever, and therefore their flageolet expresses nothing but a rude attempt at approximating tone-relations which the more flexible apparatus of the voice enables them to reach in their songs.

Summary. The results of the foregoing investigation may be summed up thus: The deficiencies and defects of Indian music are, first, lack of sensuous beauty of tone quality; second, uncertainty of intonation. There is apt to be more or less wavering of pitch under any circumstances and this defect is most pronounced in the Indian flageolet, which always gives out its tones in false key-relationship owing to its faulty construction. The more it is used, the more it accustoms the ear to false intonation and it is therefore fortunate that this instrument is never used to accompany Indian singing. The only exception to this is in the case of some of the love-songs; and it is precisely in these that the intonation in singing is most wavering and uncertain.

But it seems clear that, notwithstanding these defects, the sense of key-relationship and of harmonic relations as determining the key-relationship of melodic tones is at least subconsciously present in the Indian mind. For when the melodies are given in correct pitch and with natural harmonies the Indians soon come, to recognize and enjoy them.

The merits of the Indian music consist, first, in an elaborate, well-developed rhythm; second, in fresh, original, clear, characteristic expression of the whole range of emotional experience of primitive people. As such, this collection of songs must necessarily prove of interest even if they were less beautiful than they are. Those here given form only a fraction of those in Miss Fletcher's possession; and those she has are only a small percentage of the great number which might be collected under favorable conditions. But the older songs are rapidly passing away under the changing conditions of Indian life and must be gathered soon if they are not to be forever lost. It is greatly to be hoped that the work of collecting and verifying them may be pressed before it becomes too late.

The problems presented in the study of primitive music are two:

1. The problem of the origin and function of music.
2. The problem of the psychological, physical and acoustic

laws in accordance with which the musical phenomena have become what they are.

1. As regards the first of these problems, I, at least, can have no doubt that music takes its origin in the impulse to express states and movements of the sensibility. These Omaha songs mean *feeling* to the Indian, in all cases. Nine-tenths, at least, of the criticism I have received from Indians in my efforts to play these songs has had reference to emotional expression; and there is not a song in the collection which does not express to the Indian as well as to myself and other white persons who have heard them, well defined moods or excited states of feeling. They had their origin in feeling and their function is to express feeling. And this conclusion I correlate with other similar facts into the generalized statement that the content of music is emotion. I am, of course, aware, that distinguished critics, chief among whom are Dr. Edward Hanslick and the late Edmund Gurney, maintain the opposite opinion. But this opinion I believe to be based solely on a misapprehension such as might, perhaps be easily explained by a proper definition and analysis of emotion, which I have not found in the works of any writer on the æsthetics of music. Even Dr. Hanslick, while admitting that music may express the "dynamic element" of feeling, fails to perceive that what he calls the "dynamic element," identifying it, as he does, with "psychical motion," is really emotion itself. And he overlooks also the fact that states and movements of the sensibility may be expressed so as to be recognizable without reference to the *ideas* involved in them.

It is true enough that music by itself does not and cannot express love, hate, anger, jealousy, revenge, etc., if we include in these terms, as we seem forced to do, the conception of two or more persons and their relations to one another. There is, of course, no musical equivalent for a man or woman or for the relations between the two nor for two men fighting, etc. But these ideas are purely of the intellect, not of the sensibility. The *purely emotional element* awakened by these ideas, and that alone, is expressible in music. And emotional excitement frequently, if not always, begets the impulse to musical expression. At least, the impulse to express states and movements of the sensibility in song is nearly or quite universal among all the varieties of the human race and it seems to me wholly unphilosophical to deny that the content of

music is that which gives it its origin, which it expresses to those who produce it and which it also conveys to other minds.

2. The second problem may be succinctly stated thus: What determines the particular form of musical expression?

From the psychological point of view it may be answered that the content determines the form; *i. e.*, the feeling which the primitive man is impelled to express in song finds its own mode and means of expression spontaneously. This Omaha music illustrates this admirably; for Indian song is an absolutely spontaneous natural product.

But there remains the further question: What correlations of the mind with the auditory and vocal apparatus and of these with the physical laws of acoustics determine the course of melody? Under this head numerous questions immediately suggest themselves in view of the observed facts. For example, how does it happen that, not only among the Omaha and other Indians, but also among the Chinese, the primitive Scotch, Irish, Negroes, etc., the impulse to express emotion in song should so frequently result in melodies based on the five-toned scale? What facts and laws determine the development of this into the full scale of eight tones in common use? What determines aberrations from this scale, such as are found in various songs of this collection? What determines the choice or the preponderance of major or minor? Is there anything in the facts of primitive music which will help us to determine whether the minor chord is a perfect or imperfect concord? If the former, does it depend on some acoustic principle opposed to that which generates the major chord, or not? These are all questions of importance in the fundamental science of music, none of which can be regarded as settled in any way which commands universal acceptance.

I have already pointed out that my experience during this investigation has led me to think that the fundamental fact which is to point the way to the solution of some, at least, of these questions is that the harmonic sense is universal. It seems clear to me that the course of these melodies can be accounted for in no other way than on the assumption that the Indian possesses the same sense of a tonic chord and its attendant related harmonies that we do; although, of course, it is latent and never comes clearly forward into his consciousness. The five-toned (major) scale, exemplified

so numerous in this collection of songs, may be regarded as a tonic chord with two bye-tones, one of which belongs to the dominant and the other to the sub-dominant chord. At first, perhaps, there is merely a feeling for the tonic chord, arising from the complex nature of a single tone with its consonant overtones. The two bye-tones, are perhaps, in this stage, merely used to partially fill up the gaps between the tones of the tonic chord, which is often implied in the initial melody tone. The dim perception of the harmonic relations of these two tones would seem to be a later development which results in the addition of the missing fourth and seventh tones of the scale. How the feeling for the tonic chord is generated in melodies which do not begin with the key-note, and especially in those which begin with a bye-tone, as some of these songs do, I am, as yet, unable to conjecture. Nor am I, at present, able to discuss the other questions here raised more fully than I have already done. But I hope further investigation may fully disclose the natural laws which govern these phenomena and I am strongly in hopes that the suggestions here offered may prove fruitful.

No. 1.

