

THE HARMONIC STRUCTURE OF INDIAN MUSIC

BY

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NOTE—The following paper was prepared for the American Association for the Advancement of Science which met last year in Boston, but it was not presented owing to the sudden death of Professor Fillmore a few days before the meeting. Through the generous kindness of his widow and son, I am now able to offer it for publication, and to supply from his manuscript records the illustrations he had intended to present with it.

Professor Fillmore entered on the study of Indian music at my request in 1888. For several years previously I had been gathering and examining aboriginal songs, and had discerned in them musical problems that required for their solution not only technical skill, but a broad and comprehensive culture. I sought long and widely to find one with the requisite attainments and the requisite courage to enter this unknown field and to grapple with its unknown problems. At last I was directed by some musical scholars to Professor Fillmore, and the result has proven his fitness for the delicate and difficult task he essayed.

His interest in music as a science added zest to his original research. He writes: "These Indian songs have an important bearing on such questions as the origin of scales, the relation of primitive melody to harmony, the naturalness of our major and minor scales, the progressive development of them, and the fundamental question, What is the line of least resistance for the human voice in primitive man making music spontaneously?" All these questions he lived to solve.

Professor Fillmore's use of the term "primitive man" is not to be taken in its technical sense. He says: "We are now forever unable to get at the real primitive man and to observe his processes in the evolution of folk-song. But surely the songs which show us the actual process of transforming excited howling into songs with unmistakably harmonic pitch-relations, take us very far back toward primitive music-making. What we should find if we could get still farther back I do not know; but I cannot resist the conviction that it would not be inconsistent with the evolutionary process already discovered."

The tracing in Indian songs of motivization, of finding them "as

strictly developed out of modified repetitions of a motive as are the movements of a modern symphony," proved for him "a most delightful and fascinating occupation."

His remarkable work, cut short by his untimely death, bears abundant evidence of his thoroughness as a student; of his power to discern fundamental truths in the most meager material; of his rare gift of tonality which enabled him to exploit folk-songs with an ability never exceeded; of his soundness of judgment and his fairness of statement. He has made possible a study of the evolution of music along lines that correlate with those which have lifted the desultory observations on man into the science of Anthropology.

ALICE C. FLETCHER.

Probably everyone, at the first hearing of Indian music, is impressed with the difference between it and our own. That is my own experience, and is also the experience of all other white people I have known who have come in contact with Indian singing. The impression made is that of a crude, barbaric attempt at music which seems to have very little in common with our own. We do not at once discover what this music means to the Indian; we do not see that the savage strains express, to those who make them, any of those emotions we are accustomed to associate with music. In the case of some of the wilder and more savage tribes, the sounds we hear bear so much greater resemblance to the yelps and howls of wild beasts that we may be impressed with the feeling that these people, when they are singing at least, have more in common with the lower animals than with us.

In the case of many who make no attempt to go below the surface, this impression persists. I have met not only uneducated frontiersmen, but even cultivated people, who seemed unable to get rid of the impression that Indians have no music worthy of the name; that is, no music which is intelligible to us as expressing emotions which are common to the race. I have even known this opinion to be publicly expressed by men distinguished in one or another department of science, and even in music.

There are also many who seem to get the impression that Indian music differs essentially and fundamentally from our own,

not merely in power of expression but also in its melodic structure. Many who have heard more or less of Indian music, either directly or in phonographic reproductions, seem to think that Indian melodies are the product of natural laws different from those which determine the structure of our own melodies. They frequently fail to recognize, in the intervals out of which Indian melodies are made, those which characterize our own; or if they do think they recognize familiar intervals, they also think they discover differences which may be essential, and they fear to class them under our own familiar chord and scale intervals, lest they should, as one scientific investigator once put it to me, "import our Aryan ideas into the music of alien races." In short, there is an impression abroad that Indian music is based on one or more scales different from our own and characterized especially by smaller intervals than any which find place in our civilized music.

In this paper I shall confine myself to an examination of the essential structure of Indian melodies and a careful comparison of them with our own folk-melodies with reference to the intervals of which they are made.

My title to speak on this subject rests on a ten years' study of Indian songs, a study which has been at least honest and careful and as thorough as I have been able to make it. The incitement to it came originally from Miss Alice C. Fletcher, who induced me to study her very large collection of Omaha and other songs. In doing this I had the invaluable assistance of Mr Francis La Flesche, who not only gave me days and weeks of his own time, but accompanied me to the Omaha reservation and obtained for me opportunities not otherwise attainable. This study was afterward supplemented by improving the unusual opportunities afforded by the World's Columbian Exposition, where Dr Franz Boas afforded me the opportunity to study a large number of Kwa-kiutl and other songs of the northwest, and where I also recorded songs of the Navaho, besides making some valuable collections

on the Midway Plaisance. I am indebted to Dr Washington Matthews for the opportunity of studying his collection of phonographic records of Navaho songs, and am of course acquainted with the published songs studied by Theodor Baker, Stephen Powers, and Benjamin Ives Gilman. Dr Carl Lumholtz gave me a number of songs which he collected in Mexico among the Tarahumare and Tepehuane, tribes seldom visited by white men; and Mr Charles F. Lummis, of Los Angeles, introduced me to several Tigua Indians of the pueblo of Isleta, New Mexico, from whose singing I recorded some twenty or thirty songs. Other songs have come to me from different quarters during the three years I have spent in California, and last summer I visited the Coahuila reservation in that state and obtained some very valuable material. Quite recently I have obtained from Dr Lumholtz several new songs from Mexican tribes not hitherto reached. I have also listened to several hundred songs recorded on the graphophone by Mr La Flesche, including rituals from at least a dozen tribes and half a dozen linguistic stocks, some of which had never before been exploited. Many of these records are of special value because they come from old pagan priests who have never been in the least affected by missionary work or by contact with the whites, but who were the repositories of the most ancient traditions of their race, of which these songs are an essential part. It should also be mentioned that I have a limited acquaintance with Eskimo songs; and it goes without saying that careful comparison has been made with old-world folk-songs, especially the numerous Magyar and Slavic, and such Arabic, Turkish, Malay, Chinese, Japanese, and other songs as I could obtain. Altogether I have studied many hundreds of aboriginal American songs, of many different tribes and linguistic stocks, ranging from the Arctic ocean to Central America and from the Atlantic to the Pacific, enough, I am confident, to warrant general conclusions as to the laws which determine the forms of our aboriginal melodies.

I say laws, for I assume that the forms taken on by primitive

melodies are no more accidental than are any other natural products, mental or otherwise. Vocal music, of course, precedes all instrumental music by an immeasurable interval. When vocal music is made spontaneously, without reference to any theory, it must follow the lines of least resistance, must obey the general law of all activity, physical and mental. The real questions to be determined, then, in studying the structure of primitive songs, are such as these: What direction does the voice take when primitive man expresses his feelings in song? Is that direction the same for all races of men, or are there different laws which govern the kind of intervals used by different races?

I ask your attention, therefore, to a number of characteristic examples of aboriginal songs, taken from tribes belonging to different linguistic stocks and dwelling in widely separated portions of our country, and which for the greater part have not as yet been published.

I present first some songs of the Navaho tribe as being the most primitive in character of any I have yet studied. They form, in fact, the connecting link between excited howling and excited singing. The quality of tone is indescribable, being more like a yelp than anything else; but the intervals yelped are unmistakably those of the major chord or of the minor chord.

No. I. NAVAHO.



The *tone-quality* is that of shouting, or even howling, but the *pitch-relations* into which they tend to fall are those of the major chord. There is a key-note or tonic which persistently asserts itself and predominates overwhelmingly throughout the song. Associated with this key-note are only two other tones:

the major third and the fifth of this key-note, making a major tonic chord.

No. 2. NAVAHO.



This song also is made exclusively of the tones which compose the major chord, only here the key-note predominates so strongly as to make the song exceedingly monotonous. The line of these melodies is a chord line, a harmonic line.

No. 3. NAVAHO.



Some of the Navaho songs are illustrations of melody so primitive as to bring us very near to the beginning of music making. In example 3, C is plainly the key-note, and the song is confined mainly to that tone and its minor third, E flat. G, the remaining component of the tonic chord, does not appear at all, but B flat comes in at first so decidedly as to suggest E flat major as the tonic chord. It also appears later as a bye-tone. The implied harmony of the song is plainly the chord of C minor as tonic, and its relative major, E flat.

In all these primitive Navaho songs the gaps between the chord tones are filled up by tones belonging to the nearest related chords, viz., the dominant, the subdominant, and the relative minor. These intervals, when arranged in consecutive order, produce exactly the major or minor scales which we ourselves use, although seldom complete.

No. 4. NAVAHO.



This song is plainly in a major key, the key-note being extremely prominent and the chord tones predominating. The second and sixth tones of the major scale come in as bye-tones, the former being so used at the ends of some of the phrases as to imply the dominant chord. The song is in the well known five-tone scale.

I will now present a song which has more developed diatonic melody than any of the preceding examples :

No. 5. NAVAHO.



The song is in a major key, and tones of the major chord predominate ; but it employs somewhat prominently the sixth tone of the major scale and much less prominently the second and seventh tones. Its characteristic melodic phrase—

No. 6. NAVAHO.



which is repeated many times, is as completely diatonic as our own melodies. The sixth of the scale, as here used, plainly im-

plies a harmony closely related to the tonic, either the subdominant or the relative minor chord. The seventh of the scale is here used as a mere melodic bye-tone leading up to the key-note. The second of the scale occurs only once in the whole song.

How old these songs may be, I cannot say; but they are undoubtedly very old. They belong to the ancient pagan ceremonies of the Navaho tribe, and I see no reason to suppose that they are in any way affected by the contact of this people with civilization. What these Indians sing in the way of intervals is undoubtedly natural for them. Now, it is a very striking and suggestive fact that of all the Navaho songs I have studied, about one-third have no tones whatever except the key-note and its third and fifth. Of these about two-thirds are major and one-third minor. Nearly half the songs have either the major or the minor chord with a single bye-tone; about one-sixth have the major or minor chord with two bye-tones, and the remainder have more than two bye-tones. *Not one has an interval different from those we employ.* The line of least resistance, for the Navaho at least, is clearly the line of the major or minor chord in the simplest songs. In the more complex ones, one or more tones belonging to the nearest related chord are added, until in the most elaborate songs our full scale appears.

Let us now consider some of the songs obtained from the Kwakiutl tribe of British Columbia, of which I have studied more than a hundred. The results obtained are similar to those reached from the study of the Navaho songs. Although their ethnological character is entirely different, from the structural point of view they are the same. They are all harmonic or diatonic in character.¹

¹ In order to facilitate the better understanding of Professor Fillmore's analysis of these songs, I give the two Kwakiutl examples harmonized. These songs were transcribed by Professor Fillmore from the Kwakiutl Indians themselves, at Chicago, in August, 1893, during the World's Columbian Exposition. After they had been transcribed they were played to the Indians on a piano, and were pronounced correct. Then, under the Indians' criticism, and with their approval, the harmonization here given was

The following example is in the five-tone scale, the major diatonic scale with the fourth and seventh omitted.

added to the aria. The present form, therefore, not only gives the melody as sung by the Indians, but reveals the harmonic structure of the song itself :

No. 7. KWAKIUTL.



No. 8. KWAKIUTL.



Concerning the last example Professor Fillmore writes : "The cadence is best made with the subdominant before the tonic, i. e., a plagal cadence. Although this chord is not *necessarily* implied in the melody, it makes the close more natural, and is most satisfactory alike to civilized and uncivilized ears. All this is directly in the line of my previous investigations in Omaha music, and tends to confirm the conclusions towards which those investigations seemed clearly to point. The most important of these conclusions is, that the forms assumed by primitive songs are determined (unconsciously to those who make them) by a latent sense of harmony ; that, conse-

No. 7. KWAKIUTL.



The song is plainly in the key of D major, and every phase of it implies harmony as clearly as does any civilized music. It is built on the tonic, dominant, and subdominant chords; its tonality is strongly marked, and it ends with the plagal cadence which I have so often found in Omaha and other music.

The next song is clearly in the scale of E minor, with the fourth, sixth, and seventh omitted, and implies the tonic and dominant chords.

No. 8. KWAKIUTL.



The next is a song of the Yaqui tribe of Sonora, Mexico. Señor Arturo Bandini, of Pasadena, California, who owns a large ranch on the Mexican border and is intimately acquainted with the Yaqui Indians, assures me that this song belongs to a very ancient religious ceremony. It consists of the tones of a minor chord with one bye-tone near the end, implying the dominant chord. It is the only example I have yet found among our American aborigines of any attempt at part-singing. When it is repeated, the women sing the fifth of the tonic chord to a single syllable at the interval of a twelfth above.

quently, the question of the *scale* on which any given song is built is a wholly subordinate matter, and really resolves itself into the question of *what is the natural harmony* implied or embodied in the song."—A. C. F.

No. 9. YAQUI.

1st time.  Men alone.

2nd time.  Women.
Men.

Study of the songs of the Zuñi and Tigua Indians of New Mexico yields the same results. In the following example, a Tigua song of the wheel dance, the tones imply and even actually embody chords. The song is made up mostly of the chord-tones C-E-G, with C predominating. The only other tone in the song is A, the sixth of the scale.—

No. 10. TIGUA OF ISLETA PUEBLO. (Song of the Wheel Dance.)



The two chords embodied in the song are the major tonic and its relative minor.¹

¹ For the sake of clearness I give the same song as harmonized under the criticism and with the approval of the Indian from whom Professor Fillmore transcribed the song.—A. C. F.

No. 10. TIGUA OF ISLETA PUEBLO. (Song of the Wheel Dance.)



The next song is from the same tribe and pueblo. It contains the same tones as the preceding one with the additional tone D, the second of the scale, implying the dominant chord. These tones, C, D, E, G, A, make the familiar five-tone scale :

No. II. TIGUA OF ISLETA PUEBLO. (Song of the Sun.)



The songs of the Tarahumare and Tepehuane in Mexico, those of the Sioux, Winnebago, Omaha, Ponka, Pawnee, and of the various tribes of California, as well as the Eskimo, all show characteristics similar to those already presented. In short, I have yet to find a single song of any of our aboriginal peoples which is not as plainly diatonic and harmonic as our own. If we compare them with any of our real folk-songs, such as—

No. 12. CHILDREN'S PLAY SONG.



the old hymn-tune, "When I can read my title clear," and other examples drawn from bagpipe music, we cannot but see that the differences are merely of an ethnological character; that is, they are differences of style and manner, not differences in essential structure.

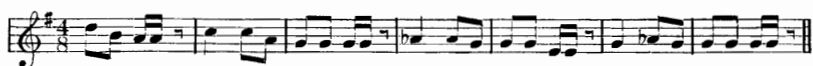
The essential thing in all music is the relation of tones to a tonic



or *key-note* ; and the tones most nearly related acoustically to any given *key-note* are the *tones of its triad*. Then come the tones belonging to its relative minor triad and to the dominant and subdominant triads. Somewhat less nearly related are the tones belonging to the major triads of the under and over major thirds and sixths.

The following Omaha song employs the under major third :

No. 13. OMAHA.



In this example there is a 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. The A flat in the song cannot be treated as a mere chromatic by-tone ; it is an important melodic note—it is principal, not accessory. A flat is the chord of the (major) under-third of C, in which key the song closes, although it begins in the key of G. The tones in this song can easily be accounted for on harmonic grounds, but not by a reference to any known form of scale.

The question of tonality in all these songs is a question to be settled by the help of harmonic considerations and not otherwise. The case becomes stronger when we come to take into account the melodies which more or less plainly imply modulation. The following Omaha choral is such an example :

No. 14. OMAHA CHORAL.



The song begins in the key of B flat, and there is not a single tone in the melody, except the E in the last measure but one, that 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. A study of this song shows its harmonic structure. 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 (the subdominant), the third measure effecting a transition to the key of F by means of the chord of G (the over-third of E flat), followed naturally by the chord of C (the dominant in F). The last clause begins in F, modulates to C in 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 one does not get from it the impression of anything forced, harsh, or unpleasant, nor feel the need of a return to the original tonic. The whole choral impresses one with its beauty, nobility, and dignity.¹

¹ This analysis will more readily be followed by referring to the harmonized version here given. In regard to this version it is important to state that it was made under the criticism and accepted as satisfactory by the men who were the leading singers of the tribe :

NO. 14. OMAHA CHORAL.

Double drum beat.

I now offer for comparison a few specimens obtained from the Midway Plaisance at Chicago in the summer of 1893.

The following is a cannibal song which I noted down in the South Sea Island Theater on the evening of September 2d. The rhythm is strongly marked; the song proceeds on a single tone until the very end, when it changes to a tone which is a component of the dominant chord, assuming, as we naturally do, that the predominant tone is a tonic. I give it what seems to be its natural harmony.¹ It illustrates steadiness of pitch on a mono-

I have many times heard this choral sung by three hundred or more Omaha men and women during the ceremony to which it belongs. This unison-singing in octaves brought out the harmonics so strongly as to make it difficult at times to realize that I was not listening to part-singing.

It may be well to repeat here that it was due to my discovery, some fifteen years ago, that when an aria was played on a piano the Indian preferred it with a harmonic accompaniment, that Professor Fillmore was induced to search for the reason of this strange preference. He wrote concerning this search and his conclusions:

"The songs submitted to me for scientific study, and also for harmonization to be tested on the Indians, caused this suggestion to ripen in my mind, as well as in Miss Fletcher's, into the conviction that the fact of the Indian's preference for a harmonized version of his song when given on a piano, points to a natural and universal law, namely, that all folk-music runs on chord-lines. Study of these Omaha songs, including the harmonizations of them which were submitted to Indian criticism, tended steadily toward the confirmation of this belief, and subsequent study and experience, extending over several years and including a varied observation of the folk-music of different races, have, as I believe, furnished ample grounds for trustworthy induction.

"The laws under which folk-music is everywhere produced may thus be formulated:

"1. Primitive men are impelled to sing, as they are impelled to shout and to dance, by emotional excitement.

"2. All expressions of emotional excitement, whether they be bodily motions or vocal sounds of whatever sort, tend to take on rhythmic forms. Rhythm is the first esthetic element to be developed.

"3. Rhythmical shouting comes after a while to acquire a certain degree of musical quality by becoming recognizably definite in pitch.

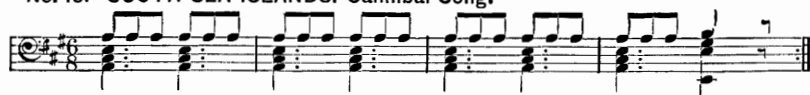
"4. This increasing definiteness of pitch manifests itself in three ways: (1) By steadiness of pitch on a monotone; (2) by going, more or less plainly, from one tone to another of a major or minor chord; (3) by moving along the line of a tonic chord with the addition of tones belonging to chords nearly related to the tonic.

". . . The primitive man, when he makes music under the impulse of emotional excitement, moves along the line of least resistance; and if several hundred songs collected from nearly all the races of the earth are sufficient to warrant an induction, *that line is always a harmonic line.*"—A. C. F.

¹ I shall give the accompanying illustrations with Professor Fillmore's harmonizations, as he intended to give them on a piano when reading this paper.—A. C. F.

tone, and its one movement is to a tone belonging to the nearest related chord :

No. 15. SOUTH SEA ISLANDS. Cannibal Song.



I obtained at the same place the Fiji war dance which follows. It implies a major and its relative minor chord, only here the center of gravity seems to be on the minor and not on the major chord :

No. 16. FIJI WAR DANCE,



The following war song I recorded in the Dahomey village. Before each of the war dances which I there witnessed, a warrior stood forth and sang a short solo, apparently addressed to the head-chief, who was seated near the orchestra. These solos invariably consisted of repetitions of a single phrase, sometimes modified and sometimes not. One of them was made up of this phrase :

No. 17. DAHOMEY WAR SONG.



It contains the tonic chord and also A, the tone which, with C and E, would make the relative minor chord of the tonic. It offers another illustration that when the tones move off the line of the tonic chord they move on to the line of a chord nearly related to the tonic.

The following Arab dance song, which I heard many times, was first sung by several girls alone, and then accompanied by an oboe while a girl was dancing. It is in a plain minor key, implying the tonic chord, its relative minor and the major dominant:

No. 18. ARAB DANCE SONG.



The next is also an Arab song. It is in minor and implies the tonic and the dominant seventh. The bye-tones, which are rather numerous, all belong to the latter chord:

No. 19. ARAB SONG.



These two examples are particularly interesting, because it is commonly said by musical theorists and historians that Arab music is very different from ours, in that the octave is divided into seventeen tones and such minute intervals are used that the occidental ear cannot appreciate them, except very imperfectly. But Dr Land, a Dutch student of Arabic music, has shown that this is an error. The Arab lute, he says, does indeed provide separate strings for the sharps and flats; but one set is used for the sharp keys and another for the flat keys; the two are never used for the same tonality. By this means each key is in pure tune, instead of being tempered as in our system, so as to make, for example, C sharp and B flat identical. The *tonality* of their music, whether major or minor, corresponds precisely with our own. This tallies exactly with my own observations of the Arab folk-music at the World's Fair.

I obtained the Australian song from Dr Carl Lumholtz, who learned it from the people themselves while he was living with them. Curiously enough, it is much more elaborate than either the Dahomey or South Sea Island songs. The harmony naturally implied in it, is the tonic, dominant, and the subdominant sixth, commonly known as the supertonic chord with a seventh. No modern composer could have produced a song with a more definite minor tonality than has this song :

No. 20. AUSTRALIAN.



I could multiply examples from the Hindoo, Russian, and Chinese, but I give but one more, a Japanese lullaby, which I obtained from M. Takaki, on July 23, 1894. It is in the same old five-tone scale :

No. 21. JAPANESE LULLABY.



In the case of races which have progressed beyond folk-song and have a theory of music and musical instruments, we are of course no longer dealing with primitive music; but it is important to note that even among these peoples their folk-songs are made on the same five-tone scale that we have found among sav-

ages and which is familiar to us in the old Scotch and Irish music.

The process of development seems to be this:

1. The key-note and its chord.
2. The addition of one of the two bye-tones which are the sixth and second of our major scale, probably the sixth before the second.
3. Both these bye-tones come in with the chord to make the five-tone scale.
4. The tonality is major or minor according as the *do* or the *la* is made the point of repose, this probably being determined by the character of the feeling expressed in the music.
5. The fourth and seventh of the major scale are afterward added to complete the dominant and subdominant chords.

In all this process it would seem that *a natural perception of the harmonic relations of tones is the shaping, determining factor.*

It seems clear, also, that this natural perception is the same for all races of men, depending on the physical constitution of the ear and of the vocal chords, and their correlations with the laws of acoustics on the one hand and with the psychical laws of the relation of music to emotion on the other.

But I shall be asked, and with entire pertinency, "Are you *sure* that the intervals sung by the Indians whose songs you have studied are the ones you have transcribed?" I answer without hesitation, Yes, I am sure. I started my investigation with the impression that there might be essential differences in structure between the Indian music and our own. I studied the Indian music for ten years with the utmost care and thoroughness of which I was capable. I have failed to find one single interval in Indian music which we do not use. It is true, I have often heard Indians sing these intervals out of tune; but this is a phenomenon by no means confined to savage or uncivilized races. In every such case, when I was singing with Indians and was able to get at their real intention, I have found that they meant to

sing exactly the interval we should sing in their place. The false intonation was due usually to precisely the same causes which produce it in our own singers. Sometimes it is an untrained or defective ear; there is just as much difference between Indian as between white singers in this respect. Sometimes it seemed to be due to an imperfect correlation of the ear and the vocal apparatus, just as it is with us. Sometimes it comes from pitching a song too high or too low. In short, an Indian singer, for the greater part, does just what a white singer of his grade of musical culture would do under the same conditions.

But I have observed also special causes for aberrations from the pitch intended by aboriginal singers. Chief among these is *emphasis*. I have frequently known Indian singers to emphasize a tone by striking it ahead of the beat and from a quarter of a tone to a tone above pitch. When I noted these tones down as bye-tones, I was met by the criticism that I had written *two tones when only one was intended*. When I played it emphatically as a simple syncopation, the Indian declared it to be correct.

I have also found Indians vary from pitch under stress of emotion, especially in love-songs. I have noted down intervals as I heard them, only to be told that they were wrong. The Indian *meant* to sing a plain diatonic interval, for he declared this to be correct when I played it. Although he had actually sung it from a quarter to a half tone below pitch, he would not tolerate my playing of anything else than the plain diatonic interval. All of this goes to show, among other things, that the Indian does not make nice discriminations in the matter of pitch. It shows also, what is very clear from all my experience, that what the Indian is thinking about is purely the expression of his feeling, and not the nicety of his intervals,—that has to take care of itself. But it makes the evidence as to the forms spontaneously assumed by his songs all the more forcible.

I have also found that increase of power is almost always accompanied with increased elevation of pitch, and diminution of

intensity with a lowering of pitch, seemingly without the Indian being aware of it. When I have asked Indians to sing louder into a graphophone, they have invariably raised the pitch. Songs which remain of the same intensity throughout I can easily play with them on a piano. Songs which vary greatly in intensity, such as love-songs, do not go well with piano accompaniment, because they vary not only the power but the pitch with every variation of intensity. Yet they will not tolerate these variations when they hear them from an instrument. Clearly they *intend* plain harmonic or diatonic intervals, and are not aware that they vary from them.

The same is true as regards the matter of sliding from one tone to another instead of making the outlines of pitch definite. The practice of Indians in this respect can be matched in any camp-meeting of negroes or uneducated whites in the United States. There is really nothing unusual about it. And as for the Indians appreciating smaller intervals than we do, there is simply nothing of the kind. The Indian ear is not more but less discriminating than our own in the matter of musical intervals; this is to be expected, since he has had no training whatsoever. When he intones an interval a quarter tone off pitch, it is not because he intends to do so, but because he is groping more or less blindly after an interval imperfectly conceived. The instant he hears it correctly given, he perceives that it is what he was trying for and immediately conforms his intonation to ours. That has been my experience over and over and over.

Further, it has been my experience many times repeated that the Indian prefers the harmonized to the unharmonized version of his songs when they are played on the piano—that is, of course, when the chords used are the ones naturally implied or embodied in the melodies. All the Coahuia songs, all the Tigua songs, all the Omaha songs, and many of the others, have been played over and over again for Indians, as many as could be reached at different times, both with and without harmony, and

always with the same result. With the natural harmonies the songs when played on the piano sound much more natural to the Indian than when played without chords.

In the light of all this experience I feel justified in stating once more, and most emphatically, the conclusion at which I have arrived, namely, that when savage man makes music spontaneously he obeys the universal law of all activity and follows the line of least resistance, and that in every instance this line is found to be a chord line, a harmonic line. Folk-melody, so far as now appears, is always and everywhere harmonic melody, however dim the perception of harmonic relations, and however untrained and inexperienced as regards music the untaught savage may be.

The first harmonies to be displayed are naturally the simplest—those of the tonic and its chord. The more complex relations are gradually evolved as a result of the growth of experience. But in every stage of its development, the harmonic sense is the shaping and determining factor in the production of folk-melody.

The evidence of the essential unity of all music, from the most primitive to the most advanced, is cumulative. The Navaho howls his song to the war gods directly along the line of the major chord; Beethoven makes the first theme of his great "Eroica" symphony out of precisely the same material. The Tigua makes his "Dance of the Wheel" out of a major chord and its relative minor; Wagner makes Lohengrin sing "Mein lieber schwan" to a melody composed of exactly the same ingredients. In short, there is only one kind of music in the world. But there are vast differences between the stages of development represented by the savage and by the modern musician; and there are also ethnological differences resulting from the physical and mental peculiarities of the races; yet, essentially and fundamentally, music is precisely the same phenomenon for the savage as it is for the most advanced representative of modern culture.

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