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Modes and Scales

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It is often said about a traditional song or tune, "It must be modal." What does that mean? In one sense, a mode is just an ordered series of notes defined by the intervals between. In that sense, there is no difference between scales and modes; a mode is simply a particular musical scale. Music of every culture has evolved around particular scales. In our modern Western culture, we are used to hearing music played mostly in traditional major or minor scales. That kind of music sounds normal. Music played in other scales sounds different, and we often use the term *modal* to describe it. In that sense, modal has come to mean something different from our usual major and minor scales. There are many musical scales that sound normal to other cultures but different to Western ears. The concept of mode can also be much broader than the general concept of scale and may include melodic tendencies as well as associations of sentiment and mood.

For many music scholars, particularly in past centuries, a comparative study of the world's scales and modes, past and present, was viewed as a route to understanding human perception; the role of culture on auditory processing; as well as cultural evolution, history, and diversity. Working at the end of the 19th century, Alexander Ellis was one of first to publish a scientific analysis of the scales and modes of various nations. Creating an inventory of the world's scale types was a project of interest to 20th-century composers and scholars, among them Nicolas Slonimsky. Once a major topic in ethnomusicology, fewer scholars study mode and scale purely for comparative purposes, although they, along with music theorists and analysts, still study tonal series and their implementation as related to composition and practice.

Inventive practicing musicians, particularly composers and jazz musicians, are the most dedicated to categorizing and experimenting with the variety of the world's musical scales and modes.

This entry explores some of these modes or scales, characterizes them, and discusses what makes them different.

From Ancient Greek and Medieval Church Modes to Western Folk Music

The ancient Greeks described the physical world in terms of four elements: earth, air, fire, and water. Health and spiritual well-being were thought to depend on the balance of four bodily fluids or humors. These humors correspond to the four elements: phlegm, or phlegmatic humor (water), bile, or choleric humor (fire), blood, or sanguine humor (air), and black bile, or melancholic (earth).

The Greeks used music for healing and to influence the spiritual state or soul. Certain melodies were associated with the four humors and were used to affect the soul. Music was thought to amplify or weaken the humors. Eight modes or musical scales were used to affect these humors: *Dorian* and *Hypodorian*, *Phrygian* and *Hypophrygian*, *Lydian* and *Hypolydian*, *Mixolydian* and *Hypomixolydian*.

The basis of the ancient Greek musical scale was the tetrachord (meaning four strings). This was a four-note scale. The difference between the 1st and 4th notes was always the interval of a perfect 4th (or the 1st and 4th notes of our major scale). The intervals between the notes could be various combinations of whole tones and half tones (semitones).

The octave was recognized by the Greeks as a fundamental interval (doubling of frequency). An octave scale was made up of two tetrachords separated by a whole tone. In the ancient Greek system, the notes of a scale were arranged in descending order. The use of two tetrachords and a whole tone separating them results in a 12-tone octave scale.

Arabic and Indian music divides the tetrachord differently from Greek. In Arabic music, 10 possible intervals (quarter tones) can be used to divide the tetrachord. The use of two tetrachords and a whole tone separating them results in a 24-tone (quarter-tone) octave scale, as will be discussed later in this entry.

The most common division of the Greek tetrachord in the diatonic group was that of two whole tones and a semitone (in descending order). This might be represented in Western musical notes as E=D=C-B (a whole tone interval is noted as = , half tone as -). Adding a second tetrachord A=G=F-E separated from the first by a whole tone would result in a diatonic scale (dia tonic) of one octave as E=D=C-B=A=G=F-E. This is the basis of our western diatonic major scale.

Depending on which note this scale begins with (the tonic), using only the white keys of the piano (no flats or sharps), we can derive the eight ancient Greek modes, each associated with a different element and humor.

The medieval (church) modes defined by Pope Gregory (c. 540–604) use a slightly different nomenclature. Again, you can think of these modes as using only the white keys of the piano. Depending on which note you start with (*Ionian* starts with C, Dorian with D, Phrygian with E, Lydian with F, Mixolydian with G, *Aeolian* with A, *Locrian* with B), the eight ascending notes describe a different modal scale. These modes are shown below. Each has a distinguishing characteristic and a difference in notes, raised or lowered a half tone from our major scale (the Ionian mode).

Ionian (major), all major notes

C=D=E-F=G=A=B-C

Dorian, lowered 3rd, lowered 7th

D=E-F=G=A=B-C=D

Phrygian, lowered 2nd, 3rd, 6th, and 7th

E-F=G=A=B-C=D=E

Lydian, raised 4th

F=G=A=B-C=D=E-F

Mixolydian, lowered 7th

G=A=B-C=D=E-F=G

Aeolian (minor), lowered 3rd, 6th, and 7th

A=B-C=D=E-F=G=A

Locrian, lowered 2nd, 3rd, 5th, 6th, and 7th

B-C=D=E-F=G=A=B

The most common modes are the Ionian (same as our major scale), the Aeolian (same as our minor scale), the Dorian, and the Mixolydian. The Locrian is occasionally found in Icelandic and Greek music as well as in some music of the British Isles.

Modes can exist in different keys simply by starting on a different note but keeping the same intervals between the notes. The intervals between the notes is the characteristic that defines the mode.

The Dorian mode sounds mostly like a minor scale, except that the 6th note is the same as in the major scale. It has a certain ancient, primitive, even Oriental feeling, and is a welcome alternative to our common minor.

It is often used in European and American folk music. The songs "What Shall We Do With A Drunken Sailor" and "Scarborough Fair" ("Parsley Sage Rosemary and Thyme") are in the Dorian mode (Figure 1).

It is often possible to harmonize a melody in Dorian mode by a drone of the minor I chord (e.g., in D Dorian by using a D minor chord), with an occasional major VII chord (e.g., in D Dorian by using a C major chord). The C major chord works because it shares the same notes as those in the D Dorian mode (Figure 1).

The Mixolydian mode sounds mostly like a major scale except at the upper portion where the 7th or leading note (leads into the final 8th note) is the same (lowered) as in the minor scale. Most jazz, Afro-Cuban music, and **rock 'n' roll** tunes use this mode. It is also used in folk music. The Beatles tune "Norwegian Wood" uses this mode (Figure 2).



Figure 2 Mixolydian mode



Figure 3 La Rosa Enflorese







There are, of course, many other scales or modes. In Klezmer and eastern European gypsy music, a distinc-

tive scale is used with a wide interval of three half tones (as noted by \equiv). This is the *Freygish* mode in Klezmer music (D-Eb=F#-G=A-Bb=C=D) or the Hungarian minor in gypsy music (C=D-Eb=F#-G-Ab=B-C). Similar to a minor scale, they employ a wide gap between the 2nd/3rd or 3rd/4th and 6th/7th notes. The Sephardic Ladino song "La Rosa Enflorese" ("Los Bilbilicos") uses this mode (Figure 3).

There are also pentatonic scales (as opposed to diatonic) with only five different notes, for example, any scale using only the black keys on the piano. Pentatonic melodies are common in Asian music. Old Irish music sometimes uses a pentatonic or gapped scale in which two of the notes in the diatonic scale are omitted. A traditional Shetland Island tune, "The Blue Reel," uses a gapped pentatonic scale (G=A=C=D=E=G) (Figure 4).

Turkish, Arabic, and Persian (Iranian) Modes and Scales

There are close relations between Turkish, Arabic, and Persian (Iranian) music, but the nomenclature is different depending on the language. For the purpose of this discussion, we will concentrate on Persian music. Little is known of Persian music prior to the conquest of Persia by the Arabs in 642 C.E. With the Abbasid dynasty (750–1258 C.E.), musicians and music scholars became dominant figures in the development of Persian culture. In the 20th century, some Persian scholars began to investigate the theoretical basis of their music.

The basic *scale* of Persian music is 24 tones, which divides the octave into quarter tones. But this is not a scale in the chromatic sense—playing of successive tones along the *scale* does not occur in this music. Quarter-tone intervals are not all the same but may vary slightly in pitch depending on their placement in the melody and the mood that is desired. If an octave is divided into 1200 *cents*, a whole-tone interval would be about 200 cents, a half-tone about 100 cents, and a quarter-tone about 50 cents, depending on whether it is untempered or even-tempered. Quarter-tone intervals in Persian music can vary by about +/- 10 cents.

Traditionally, Persian music is monophonic—one voice or instrument. Harmony is not a part of this music.

The Persian *tar* is a stringed instrument with fixed frets at the whole-tone and half-tone positions and moveable frets that can be set at the exact micro intervals desired by the musician. A typical tar may have 17 frets between an octave—not all quarter tone are used, and some frets accommodate quarter-tone intervals of slightly different values. The '*ud* is an unfretted string instrument, so the musician has an unlimited number of microtones.

Traditionally, a master Persian musician would have a collection of about 300 short melodies (each known as a *gusheh*). The student would learn and memorize these by listening closely to the master. These gushehs (short melodic movements varying in length from a few notes to maybe a dozen or more) would then be used as the basis of a larger composition with improvisation for a musical performance. This whole body of music is known as the *radif*—raw or model melodic sequences representing a common repertoire. The radif can be divided into seven *dastgahs*, some of which have several subclasses known as *avaz*. Sometimes the radif is divided into 12 dastgahs if the subclasses or avaz are included as separate dastgahs.

Each dastgah has an individual scheme of seven notes and is identified by the name of the initial melodic phrase or gusheh. Each of the gushehs is given a name. The performer selects gushehs to fit a particular composition and puts them together with improvisation. The dastgah system in Persian music is relatively new and dates back only to the 18th century.

For the sake of brevity, we will describe just one dastgah, the Sur, and its associated avaz:

Sur: G Ap Bb <u>C</u> Dp Eb F G

There are four associated avaz or subclasses of the Sur:

Abu Ata: G Ap Bb C D Eb F G

Bayat-e Tork: F G Ap Bb C D Eb F

Afashari: F G Ap Bb C D(p) Eb F

Dashti: G Ap B C D(p) Eb F G

Note: The underlined letters have the approximate function of a tonic—a sort of resting note that the melody often returns to. The small p indicates an approximate quarter tone lower than the indicated note; the small b indicates a flat—a half tone lower.

Indian Ragas, Modes and Scales

The music of India sounds exotic and quite different to Western listeners. Two major reasons are tuning and scales. Western music, as it is commonly played, uses an even-tempered scale whereas Indian music adheres to an untempered or just scale where the intervals between the notes are not all equal but are perfect intervals based on Pythagorean ratios of frequency that are simple fractions. Like Western music, Indian music divides the octave into 12 notes and uses a scale of seven notes, but it sometimes uses a scale of fewer or more than seven notes. Because of the un-tempered tonality, Indian music also uses microtones, called *shruti*—the octave then contains 23 shruti of slightly different values. This isn't a problem for the voice, which can easily adapt, but with keyboard and other instruments with fixed tunings, this is a problem. Even-tempered tunings work best in Western music with harmonies involving thirds and rapid modulations.

The concept of *swara* (a Sanskrit word meaning a tone of music) in Indian music refers to the pitches of the seven-note scale. The seven swara in ascending order are named *Shadja*, *Rishabh*, *Gandhar*, *Madhyam*, *Pancham*, *Dhaivat*, and *Nishad* or abbreviated Sa Ri(Re) Ga Ma Pa Dha Ni (similar to Do Re Mi ... in Western music) regardless of whether they are naturals, flats, or sharps (Figure 5).

Six of the seven-note scales in Indian music are the same as the medieval church modes (using only the white keys of a piano); there are other scales that do not fit this pattern. For example, the *Balawal* is the same as the Ionian (major) mode, and the *Asavari* is the same as the Aeolian (minor) mode. The modern *thāt* system was created by Vishnu Narayan Bhatkhande (1860–1936) in the early decades of the 20th century to classify the basic scales associated with the many Indian *ragas* or melodies. There are 10 popular thāts in the northern Indian or Hindustani tradition. In the southern Indian (Carnatic) tradition, there are over 70 *mela* (thāts).

Figure 5 Hindustani Thāts



Some Hindustani Tha-ts

These scales or modes are not just a collection of notes to be used in a raga. There are rules as to how

these notes may be used. For example, the notes used in an ascending melodic phrase may be different from those used in a descending phrase. Some notes may be considered as tonic or resting notes, while others are passing notes or dissonances.

Indian music, like Arabic or Persian, is monophonic—there are no harmonic progressions, but ragas and tunes are usually accompanied by a drone and percussion. The drone is an essential part of Indian music. It sets the tonic for the scale and mode. In Western music, with few modes or scales and with a harmonic structure, the tonic is usually obvious and one can readily identify the scale or mode. In Indian music, with its many different modes, notes, and microtones (shruti), the absence of an identifiable tonic would make this very difficult. The drone functions to define the tonic and thus establish the modality and identity of a particular raga. It also makes it possible to develop very complex modes and melodies.

The most common instrument in Indian music is the *tanpura* (*taanpura*, *tambura*). It has four long strings, which are softly picked one after the other giving a complex texture and drone to the music. The constant pitches are a tonic and a perfect fifth (sa and pa). Assuming a C tuning (the instrument can of course be tuned to different keys), the first three strings (left side) on a *tampura* are tuned to low, middle, and middle C. The fourth string (right side) is usually tuned to G, a perfect fifth. The continuous sounding of this instrument (1-8-8-5 or sa-Sa-Sa-pa) establishes the tonic of the raga and gives meaning to the mode and melody.

The raga in Indian music is not a tune, because the same raga can yield many different tunes. At the same time, it is not a scale since many ragas can be based on the same scale or thāt. There is nothing equivalent to raga in the terminology of Western music. It is difficult to explain in just a few words, but it is the feeling, the mood, the expression of the music that creates a certain experience for the listener. It is how the performer creates a *rasa* (inner feeling, essence, atmosphere) that is unique to each raga.

Each raga has certain home notes, dominant, subdominant, and dissonant, and landing notes. Ascending lines may differ in notes from descending lines. The use of ornaments and microtones may differ from one raga to another. Once you are familiar with the different ragas, you should be able to identify the individual raga associated with a particular tune or melody. Tunes are usually based on just one raga. The musician is free to experiment in his or her composition and improvise in performance. It is similar to a painter creating a specific feeling by the use of certain color tones in a certain way.

Conclusion

The term *modal* can mean many things depending on your culture, what you are used to hearing as normal, what feeling or mood the music evokes, and where the music has come from. The more we listen to music of other cultures and understand the structure, the more enjoyment we derive.

See also Pitch and Tuning Systems; Raga; Theory, Music

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Further Readings

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