THE BLUES SCALE

Phillip Pedler

This scale is so often overlooked as a legitimate tool yet it represents much of the sound of contemporary popular piano. My purpose is to show and discuss its practical and theoretical origins and demonstrate its natural expression in the folk form known as the Blues. I will also present a practical resource for learning and applying it in the most ideal form for student and teacher. The mode will be a lecture-demonstration with open forum discussion.

WELCOME

My topic is the blues scale and my aim is to give you some helpful and hopefully interesting information about this neglected scale. I will cover some of its background history, its practical origins and its theoretical justification. I will also talk about its traditional applications as well as its influence in contemporary popular song.

INTRODUCTION

The blues scale is a hexatonic or 6-note scale. This scale as it is now recognised starting on C note would read C, Eb, F, F#, G, Bb and C to complete the octave. The 'formula' in scale degree numbers therefore translates as I, bIII, IV, #IV, V, bVII. The 'blue' notes are taken to be bIII, #IV and bVII or Eb, F# and Bb as represented in the above scale. Let me play a 16 bar blues so we hear the sound of what we are about to discuss. (Demonstration performance 18 bars in total)

ORIGINS OF THE BLUES SCALE

Let us briefly look at the time scale and the geography of the events that cover our topic. The slave trade from Western Africa to the Americas began in 1619 and ended in 1809, a period of some 200 years. In 1808 the American Congress legislated to end the slave trade but it was not until 1863 that Abraham Lincoln freed the slaves with the Emancipation Proclamation. (Some illegal slave trade continued, however, until the start of the Civil War in 1861). The American Civil War ended in 1865. Scholars believe that the 'blues' began to

develop in the later part of the 19th century into the form we recognise today. The slaves work songs and spirituals that existed previously were fundamental to the birth of the 'blues'.

Two main approaches are needed to discover the origins and construction of the blues scale. Both are important and offer valuable information. The first involves a practical or musicological approach, the second, a theoretical approach.

PRACTICAL ANALYSIS OF THE BLUES SCALE

My research on this subject led me to a book first published in 1867 *called Slave Songs of the United States* (Allen, Ware & Garrison, 1867). I quote this passage from the introduction:

> "...The best that we can do, however, with paper and types, or even with voices, will convey but a faint shadow of the original. The voices of the coloured people have a peculiar quality that nothing can imitate; and the intonations and delicate variations of even one singer cannot be reproduced on paper. And I despair of conveying any notion of the effect of a number singing together..." (pp. iv-v)

Dick Weissman (2005) adds, "Whatever parallels we find in African music and the blues, we need to keep in mind that we do not have any recorded examples of African music or blues from the late 19th century, the time when scholars believe the blues first evolved." (p. 9)

Unfortunately, the portable recording device had not yet been invented, so we are left with some inaccurate transcriptions. The 12 notes found within the tempered European octave cannot describe the pitch of African music and that we have inherited a notation system that also fails to deliver.

The first vocal blues recording was made in November 1920 by Mamie Smith who recorded *'Crazy Blues'*. This song was a great success, selling 75,000 copies in the first month. (Shuller, 1986, p. 226).

Recently, I purchased a CD from the world of contemporary popular music, on which great singers performed duets with the late Ray Charles. He was able to sing those peculiar notes in the 'cracks' with ease, even with tempered accompaniment.

We now need to refer to African musical culture.

Scales found in Western Africa.

The pentatonic (five-note) scale is close to universal, being used by almost all cultures throughout the world. It is generally assumed that the pentatonic scale was the predominant mode for the making of melody in Western Africa. According to Sargeant (1976):

> ...it is just as difficult to prove that the pentatonic was borrowed outright from the European idiom. The scale exists among the native Africans. (p. 152)

Shuller, in *Early Jazz* (1986), confirms this and adds:

> African melody tends to emphasise pentatonism; the use of the sub-dominant and leading tone is by no means uncommon. (p. 44)

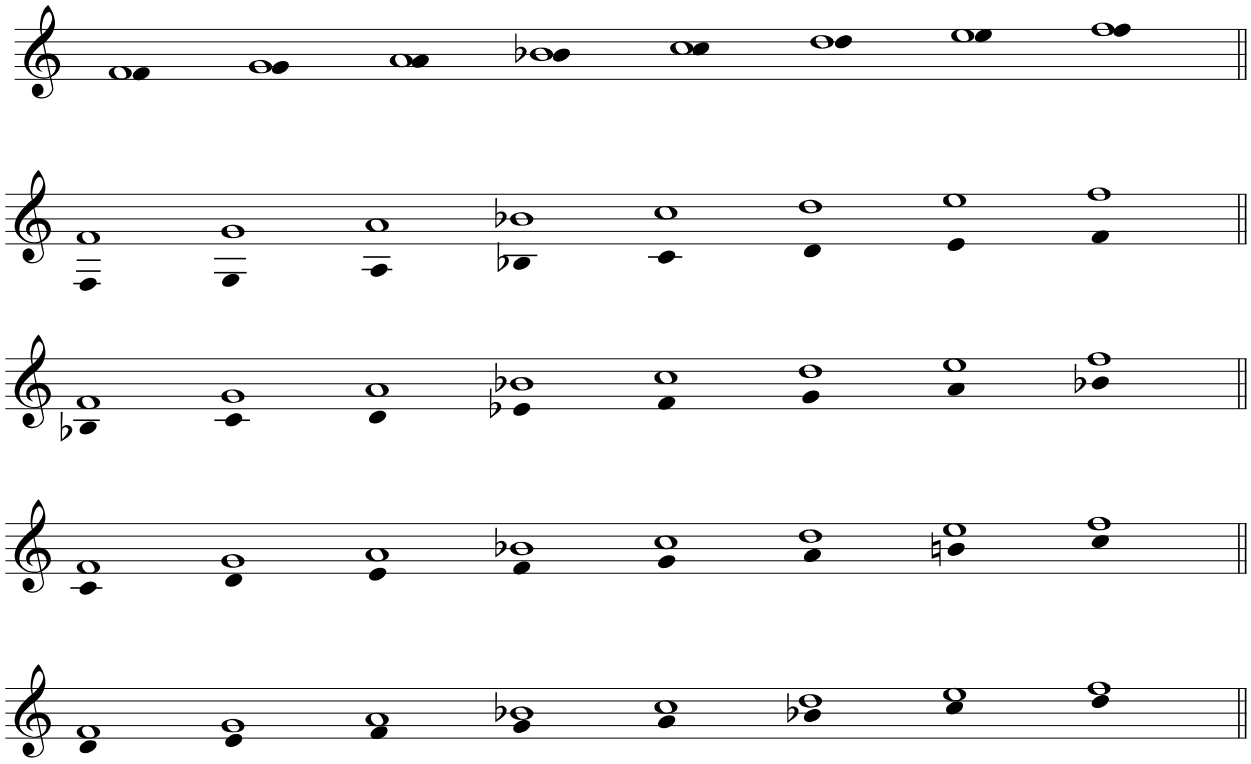
This tells us not only that the pentatonic scale is prevalent but also reveals a recognisable seven-note diatonic scale. It is however not conclusive how each note and the interval between each note is pitched. Primitive cultures tend to sing 'just' or pure tones and their instruments determine what the tuning will be. This is not as we currently do, where the tempered scale dictates tuning to the instrument. One needs an understanding of advanced mathematics as a pre-requisite for tempered tuning and this is something the African culture did not possess. Traditional African instruments were mainly percussion, in the form of drums, some xylophones and marimba.

The human voice was of course the principal African instrument. It is not known how they intoned their scales but it is very interesting to hear how they harmonised them.

Shuller quotes ethnomusicologist AM Jones, (Studies in African Music 1959):

> African harmony is sung either in parallel fourths, parallel fifths, parallel octaves, or parallel thirds. (p. 40)

African chorus singing is unisonal or diodic ('di' implies two and pertains to a melody that is accompanied by a second melody in consonant intervals.) It can be clearly seen in the next slide what I mean by this.



This is not harmony as Europeans perceive it, but it nevertheless functions as such.

Shuller continues, quoting AM Jones:

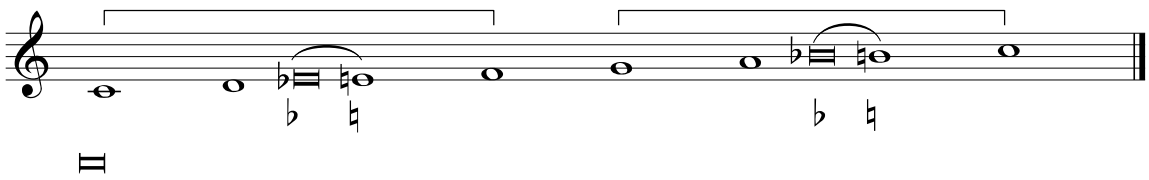
> "It is even more remarkable that many tribes who sing in parallel thirds do so to the total exclusion of any other interval. Some tribes sing in continuous organum (i.e. a voice or instrumental part accompanying a melody or primary line in parallel motion) in fourths. These tribes never, even by chance, sing an isolated third. The same is true of tribes who sing in fifths and octaves." (Italics mine.)

It is also significant that these harmony notes are considered equal in validity and function to the prime melody; one is simply the equivalent ‘harmonic’ of the other.

The way this evolved in America, as the slaves began to hear the sounds of European tempered melodies and an array of new harmonic and melodic instruments, becomes the story of the blues scale.

It seems, as mentioned earlier, when I referred to *Slave Songs of the United States* (Allen, Ware & Garrison, 1867), that the process of transcribing was very difficult, so that some pitches could not be notated accurately or at all. This was understandable, given that they could not hear the songs again without the aid of a mechanical recording device (unless of course you were a Mozart or Rachmaninoff). Winthrop Sargeant (1938) was one of the first to successfully analyse, notate and document the early history of jazz which included blues and address the above problem. He did so by transcribing fourteen highly regarded jazz solos. Why he chose the jazz idiom in preference to the simpler blues, I do not know. He did, however, discover something very interesting.

Not surprisingly, the blues scale does not appear as it is now but in the form of two tetrachords.



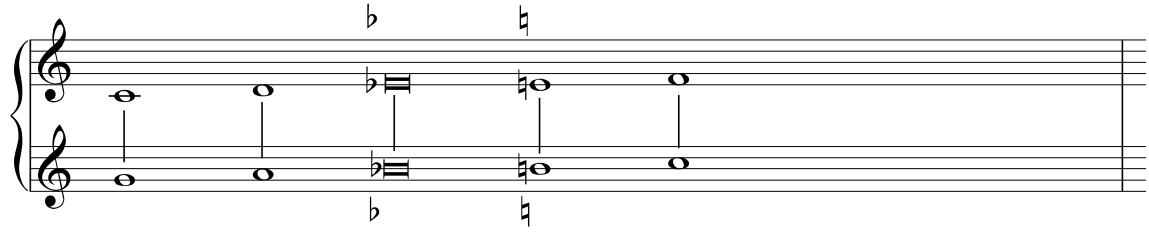
Both tetrachords are identical in their representation. The tetrachord according to Forster (2010) originated in classical Greece, where their lyres were constructed with four strings. Musicians and theorists tuned these strings to tetrachords, or to simple scales that spanned the interval of a fourth. The Greeks regarded the first and fourth tones as fixed and tuned them as 1/1(tonic) and 4/3 (fourth) respectively. The second and third tones were considered moveable tones and, therefore, not limited to specific tuning. Later Pythagoras reputedly joined two tetrachords by inserting a 9/8 tone between the fourth note of the lower tetrachord and the first note of an upper tetrachord thereby constructing a scale of eight notes. (Here we have almost the same situation, where the pitch of one middle note is variable, that is, the blue third or blue seventh.)

According to Sargeant (1976):

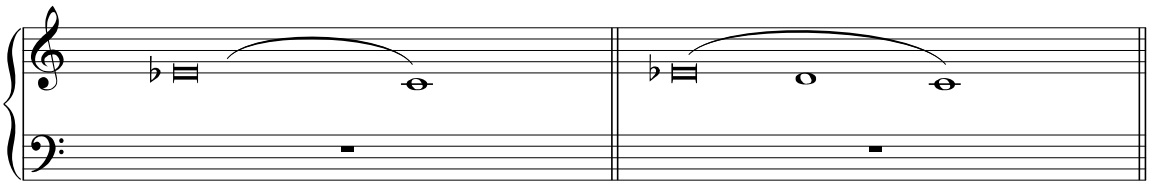
> In the process of these observations and computations a definable scale began to take shape, and certain definite traits of melodic movement began to establish themselves as universally characteristic. The tones comprising this scale may be indicated as follows. (As shown above)

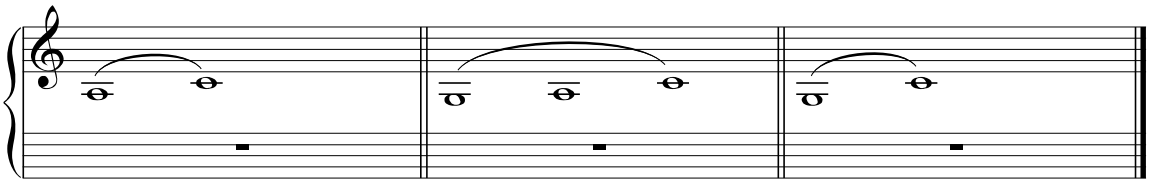
Sargeant comments that the third tone of each tetrachord has a dual character as it can appear as a third or seventh of the common major scale. It may also take on that special character known as blue, indicated by the b and note of square shape. He says:"The intonation of the blue note ranges, in fact, through an infinite number of graduations in pitch"

The next slide (s2) shows the same two tetrachords on separate staves.



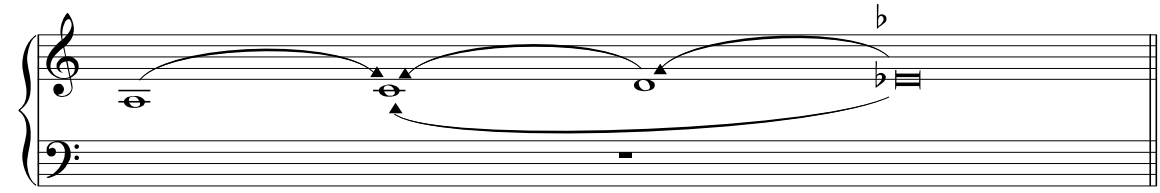
At this point, it doesn't look very dissimilar to the diody of the African tribes. Sargeant continues to describe the melodic behaviour of the individual notes as most important. This next slide (s3) shows the most common or chosen movement of notes.

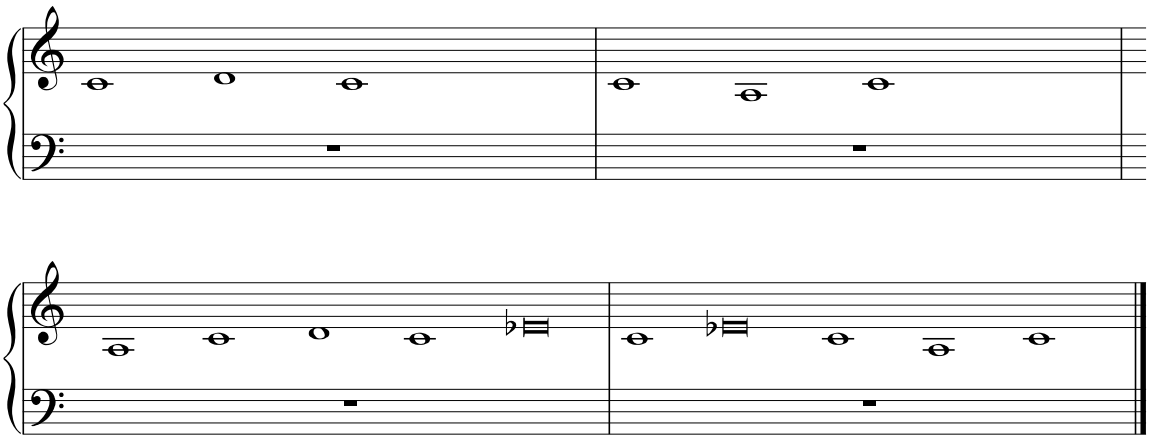




Sargeant points out that the first degree of the scale which occupies the position of tonic is very rarely approached by the natural seventh, as is the case in European melody and only occasionally is the tonic preceded by the fifth below and seldom from the fifth above.

He continues ... "The blue third and second degree, as well as the lower sixth have a close affinity for the tonic, even in passages that are not cadential."



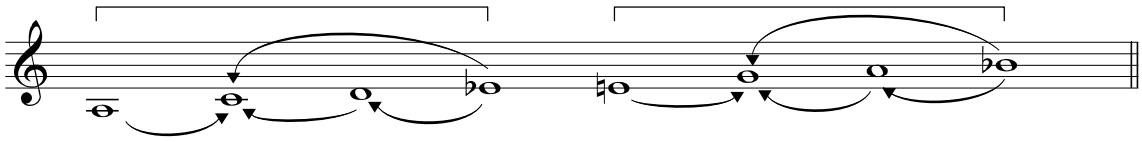


Sargeant doesn't really add much more to this except to explain that the upper tetrachord behaves in much the same way as the lower.

Concerning the blue fifth, Sargeant says "I have even heard the theory of a “blue fifth” advanced, though I have never been able to find any consistent evidence to support such a theory." (pp. 169 - 170)

Shuller disagrees with this and comments, "The fact is that the flattened fifth exists in numerous recordings as early as the twenties." (p. 51) He then lists Bubber Miley’s instrumental solos with Duke Ellington’s orchestra on *Animal Crackers* and *Black and Tan Fantasy* as examples of the flattened fifth.

Where do we currently stand from a practical view of the blues scale? This next slide shows a re-arrangement of the tetrachords previously shown. The arrows indicate the natural or most common movement of notes. Note C is still regarded as the tonic.

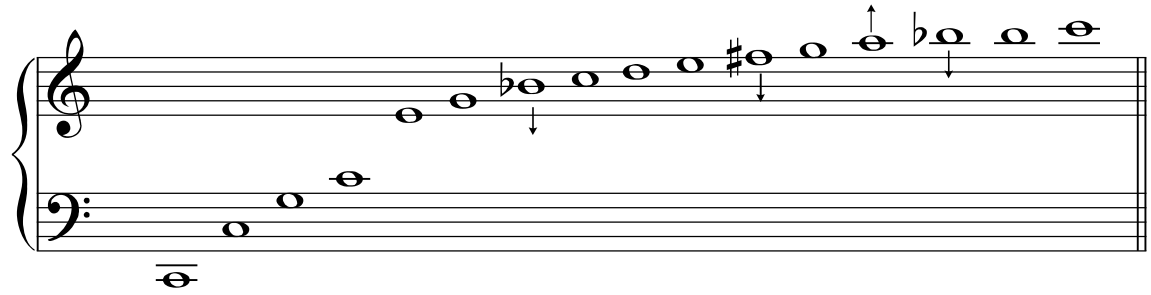


In relation to a tonic there exists a third that is movable or indefinable. This peculiar blue third appears in two identical tetrachords. The blue fifth is still, however, a relative unknown. Perhaps this next avenue of exploration can help us.

Theoretical analysis of the blues scale.

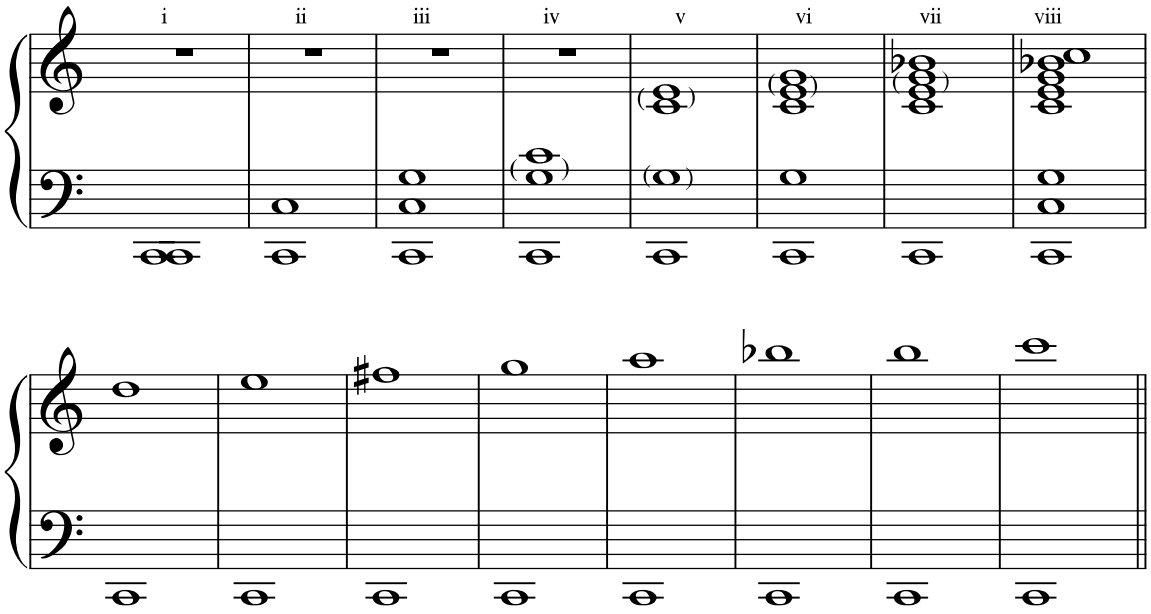
Where do scales have their theoretical origin? This is a huge study that could fill an entire conference so we are only able to cover an introduction to this very interesting subject.

We must firstly consider the harmonic series. This series of notes represents the frame of organised music, from which it finds a resonance with nature and the physical reality of sound.



This slide shows the first 16 notes of the harmonic series as near as possible to notes on the piano. (Harmonic series based on C and ascending reads, C-C'-G-C"-E-G-Bb-C'''-D-E-F#-G-Ab -Bb -B-C''''...) In reality, only the octaves on C are in tune; all others are near. The notes with arrows are still further away. It should be noted that we do not form scales from these notes but from the intervals that are created from their combination.

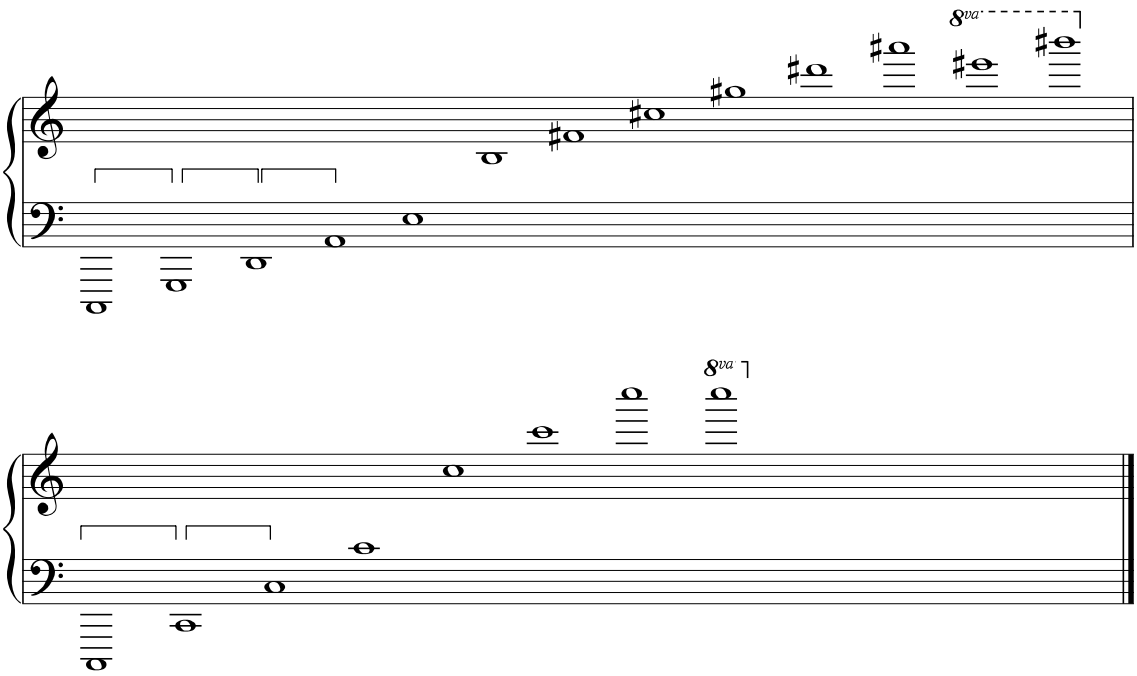
The next slide shows how the intervals that are found in the harmonic series are formed.



The first interval to be considered is the unison. This is easily overlooked as an interval but it is the first musical relationship a child or student makes. Singing or playing in unison can be a very powerful experience.

The second harmonic is the octave and is shown to be the frequency ratio of 2:1 (2/1) notes (C-C'). The octave represents the usual interval between the male and female voice; a sameness but one higher than the other. The octave does, however, represent the same harmonic identity. This interval is recognised in all cultures.

The third harmonic shows a new identity and reveals a 'just' major fifth 3:2 (3/2) notes (C-G). This interval is fundamental in generating the pentatonic scale so prevalent throughout the world. The interval of 3/2 (5th) is associated with power. The 12-tone equal temperament (12 TET) that we now have as the 'standard' is essentially formed or taken from the harmonics i through iii. We arrive at this by stacking 12 consecutive fifths (3/2s) on top of each other. i.e. C-G-D-A-E-B-F#-C#-G#-D#-A#-E#-B#. Now this last note B# (note 13) is almost the same as the seventh octave (2:1) from the first C note. The last 3/2 (B#) exceeds the seventh 2/1(C) by 23.5 cents. (100 cents =1 semitone.) A difference of 1/4 of a semitone. This slide shows what I have just described.



This difference in pitch is called the Comma of Pythagoras and it represents a problem that musicians and theorists have been trying to come to terms with for hundreds, if not thousands, of years. In fact all tempered tuning systems have to deal with a comma of sorts. What we have is an ascending spiral of fifths that is altered to form the circle of fifths. To describe this in a more familiar way, a comma or separation is in fact the reason every four years an extra day must be added to the year in order to keep the calendar from getting out of sync. As you know, the year is not made up of exactly 365 days but rather 365 days, five hours, 49 minutes and 12 seconds. The Earth's orbit is not a circle or even a perfect ellipse but ellipsoidal and the extra five and a bit hours represent the equivalent of a 'comma'. This space curve cannot be closed in order to eliminate the comma, as is done in music. We must now leave this topic and return to the harmonic Series.

Harmonic iv is the second octave from the fundamental, (C-C''). This 'double' of the octave (4/2) is not considered a new interval. It does however sound considerably brighter than the octave. There is only one new interval generated (G-C). This interval 4/3 represents the perfect fourth. The fourth and fifth are closely related as we know.

At harmonic v two new intervals appear; 5/4 is the frequency ratio representing the major third (C-E) and ratio 5/3 represents the major sixth (G-E). Interestingly, thirds and sixths always work well together as complimentary harmony. The interval of a third is associated with sentiment and emotion.

The next harmonic is the vi. The only new interval is the minor third (6/5) between notes (E-G). This interval is represented by the ratio 6/5 and again thirds are associated with sentiment.

The next harmonic is the one we have been waiting for. Harmonic vii reveals three new intervals; the minor seventh (C-Bb) 7:4 (7/4); the minor third (G-Bb) 7:6 (7/6) and a diminished fifth (E-Bb)7:5 (7/5). Do these three intervals represent the three blue notes of the blues scale? Not surprisingly, harmonics iv, v, vi, vii form a just dominant seventh chord. Does this show a relationship between the blue notes of the blues scale and dominant seventh harmony?

My own conclusion would confirm that it is so and shown to theoretically exist. What do these three just intervals sound like? The intervals found within the seventh harmonic are associated with melancholy, sadness and even depression (hence its association with the term blue). Much of this information has been summarised from a journal article, *'A tour up the harmonic series'* (Canright, 1987)

It could be argued, since the piano does not derive its temperament from harmonics above four, that this relationship between the intervals found in the blues scale and the harmonic series is not valid. My point, however, is that African music was not tempered and made use of 'just' intervals. European intervals are tempered but still retain a likeness or image to 'just' intervals. The blues scale is a hybrid. It is the 'child' of white (tempered) and black (untempered) musical culture. How it came to be so is quite a miracle.

Where now do we now stand with this peculiar scale? Are we indeed any wiser or perhaps more confused? At this point we pause on our journey through the harmonic series. Theoretically this series is endless, however there are several more significant intervals worthy of investigation.

The Blues Form

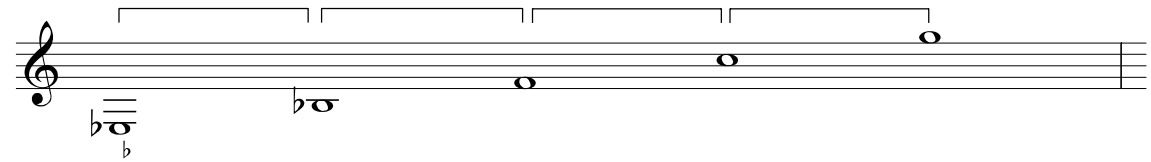
The blues scale has found its most natural expression in the folk form commonly known as the blues. It is often called a 12 bar blues but there are eight and 16 bar forms as well. The first impression of this form is its simplicity. Only three chords are found in its most basic construction. The interest becomes apparent when we realise that each one of these chords is a dominant seventh. The chords are built upon the first, fourth and fifth degrees of the major scale. This translates to the tonic chord being dominant as well as the sub-dominant and dominant. (Would the sub-dominant be called dominant sub-dominant?) How can we justify such an anomaly theoretically? Practically and musically it works.

(Demonstrate with opening melody and harmony to *'Amazing Grace'* and concluding tag at end of '*Happy Birthday'*)

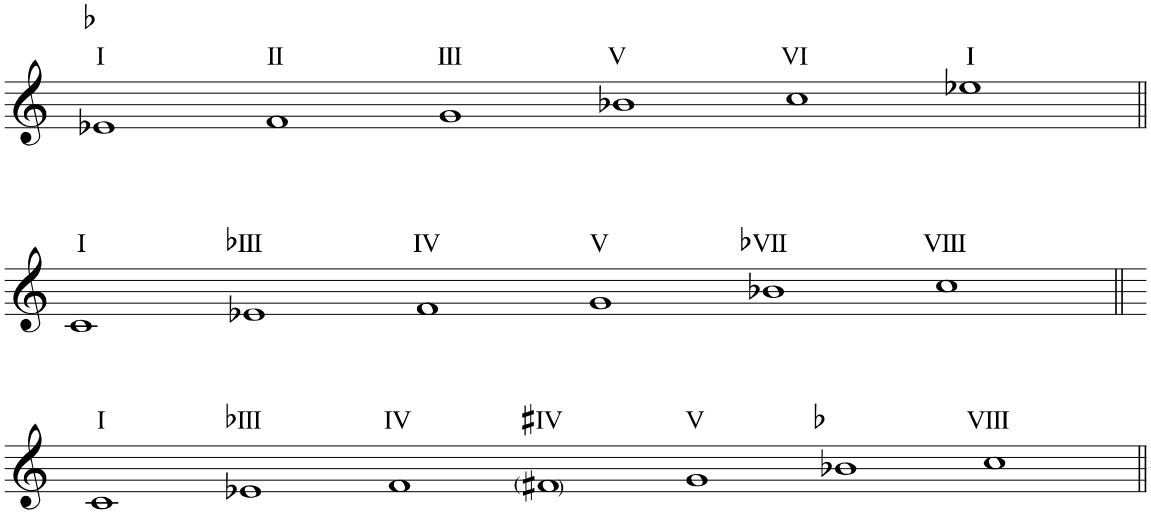
Here both tonics are dominant sevenths. We could leave the problem at this point simply with 'it sounds right so why play with it?' However, why not look a bit further and see what else can be discovered? So far there is reasonable evidence to suggest a relationship between

intervals found in the harmonic series and the dominant seventh chord. It follows that we can make further connections.

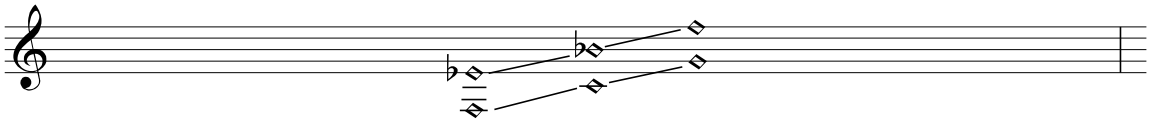
When we consider the construction of the pentatonic (five note) scale, we see that it simply involves (as we mentioned earlier) the principle of building scales by ‘stacking’ fifths (3/2s). We can begin on any note but if we start on Eb we can keep it C centred. Therefore, beginning on Eb and ascending in fifths, it reads Eb -Bb -F-C-G-...



The process of reducing these intervals within an octave allows a diatonic pentatonic scale to be formed. The major pentatonic, where the tonic is Eb, reads Eb -F-G-Bb -C-Eb. This is commonly recognised as Eb pentatonic major. Its relative pentatonic minor reads C-Eb -F-G-Bb -C. This is the closest relative to the C hexatonic blues scale. Only the F# is missing from the C pentatonic minor that would make it the C blues scale.

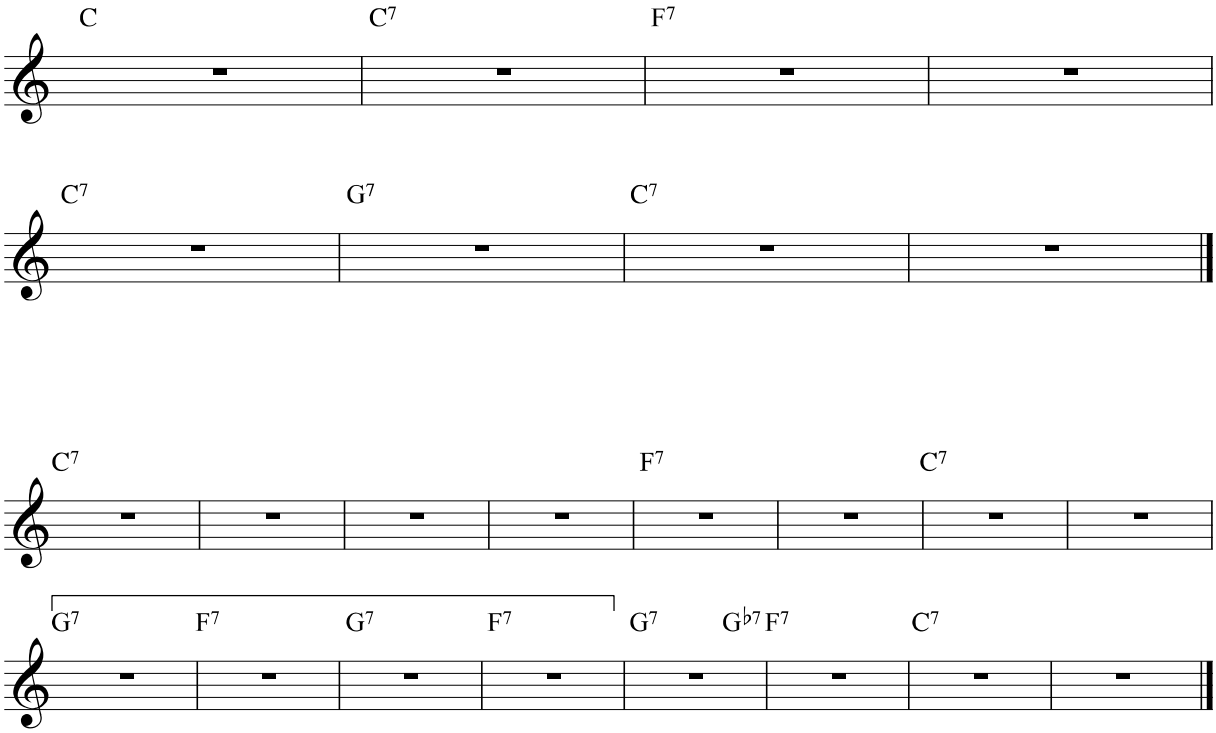


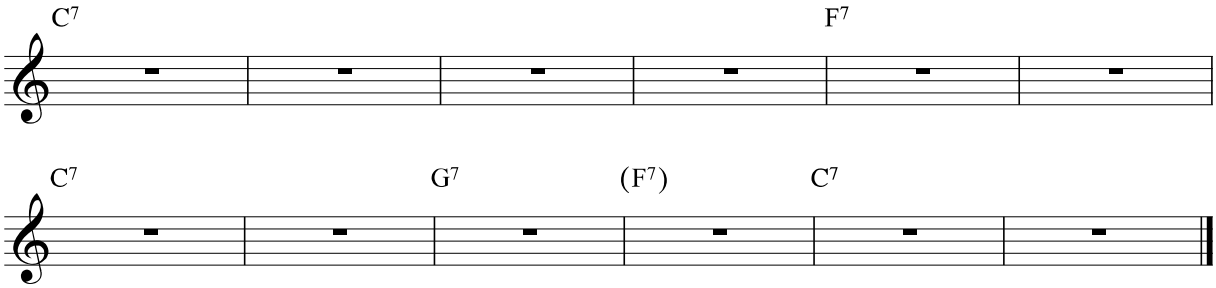
The next slide shows a re-arrangement of these notes (C pentatonic minor) where it is possible to form the minor seventh intervals found in each of the three dominant seventh chords C7-F7-G7.



These three dominant seventh shells represent a harmonic relationship between the pentatonic minor scale and the tonic dominant (I7), sub-dominant (IV7) and dominant (V7) chords. This explanation is based on WA Mathieu's description in *Harmonic experience* pp.125 -127 (1997)

It was mentioned earlier that there are three blues forms (the eight bar, 12 bar and 16 bar). The next slide shows their basic forms.





There are variations within each of these that we cannot explore at this time.

PRACTICAL EXERCISE AND STUDIES

At this point I would like to present a practical help for learning this scale. Contained in my book *Blues Scales, Elementary* are three exercises and one study for each of the 12 blues scales, a total of 36 exercises and 12 studies. This is something I would have liked to have had access to when I began the study of contemporary popular piano.

We have seen that this scale is hexatonic (six note) and it follows that the finger combinations or groups of three and three or two - two - two would naturally flow. Let's compare C major and C blues. C major uses fingers one -two -three -one -two -three - four. Grouped together, I would say that it could be seen as a combination or group of three and four and this gives us the seven notes found in this heptatonic scale. C Blues uses fingers one -three -one -two -one -three. Grouped together, this would equate to the combination two - two - two, the six notes of the scale. Remember that this scale is not something invented or discovered in order to solve a problem but something that has grown or evolved out of the cross pollination of two very different cultures; white European and black African, but born in the New World of America.

Let me now play the first exercise that is repeated as we encounter each new key. This is the preparatory exercise for the key of C. (Play now exercise one followed by exercises two and

three, complete with *Blues Scale Study 01-C Blues*.) None of these 12 studies are written using the blues form. However blues harmony is implied in many places.

At times we have all used the analogy that learning music is akin to learning a language. The art of improvisation is learnt in just the same way. Firstly, we simply imitate what we hear and repeat it until it is stored in long-term memory, to be recalled when needed. Our musical vocabulary is growing steadily as more musical words are learnt. The intended goal of these exercises and studies is to prepare the ground. We are learning the letters of our musical alphabet. Learning improvisation in contemporary popular styles requires the student to be familiar with the melodies, rhythms and harmonies that define them. The blues scale is foremost for making melody, not only in blues and gospel but rock'n'roll, jazz and many mainstream rock styles. I would now like to play another two or three studies before continuing to show their application in some jazz and contemporary pop pieces. (Play now no more than three short *Blues Scale Studies - Study in F, E and Db*.)

JAZZ BLUES

The blues scale has taken root and flourished in the fertile soil of the jazz idiom.
The blues form has been readily accepted and absorbed into mainstream jazz repertoire. I would now like to play four very different jazz blues.

The first is *St Louis Blues* (WC Handy, 1873-1958), an old blues and perhaps the most loved blues of all, published in 1914. Its author is acknowledged as one of the first to publish blues songs. In his autobiography, *Father of the Blues*, WC Handy writes:

> The primitive southern Negro as he sang was sure to bear down on the third and seventh tones of the scale, slurring between major and minor. Whether in the cotton fields of the delta or on the levee up in St. Louis way, it was always the same. (p. 120)

St Louis Blues uses the traditional 12 bars in A and B sections. It also has a peculiar introduction that is played using the tango rhythm. (Play this piece)

All Blues (Miles Davis 1926-1991) is taken from the pivotal *Kind of Blue* album in 1959 and is very significant as the start of modal jazz. This album heralded the cool era and the subsequent development of pentatonics and fourths into the improvised line. In this piece the

form is still 12 bars in length. The IV chord in bar five is usually considered as a Gm7/C rather than the usual C7. In bar 10 the harmony sidesteps to Eb7 (#V) before returning to the more recognised D7(V). It also uses the 6/8 time signature.

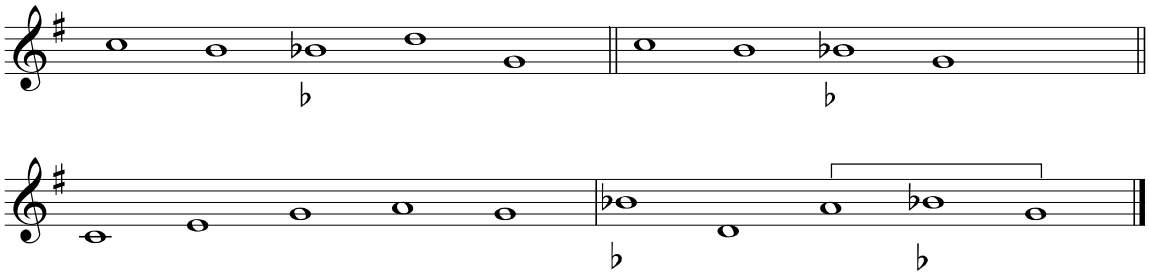
Stolen Moments (Oliver Nelson 1932-1975) is taken from the album *Blues and the Abstract Truth* and dates from 1961. The form is the longer 16 bars for the melody that returns to the standard 12 bars for solos. This is a minor blues in C and this effectively means the I chord is Cm7, the IV chord Fm7, the V7 remains G7. *Stolen Moments* is also from the 'Cool' period of the early 1960s.

Watermelon Man (Herbie Hancock 1940-) is from 1973 and the *Headhunters* album. This particular song is one of the very few jazz songs to be listed in the top 20 pop charts of the day. It uses the 16 bar form for melody and solos. It also is very significant in that it belongs to the fusion period of jazz. Rock rhythms combined with jazz melody and blues harmony to form yet another stylistic period in the evolution of jazz.

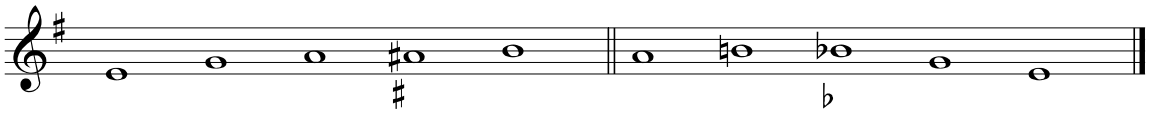
Blues scale application in popular song (1960s-1970s)

I would now like to show the influence of blues harmony and the influence of the blues scale in the melodies of these three well-known popular songs from the 1960s and early 1970s.

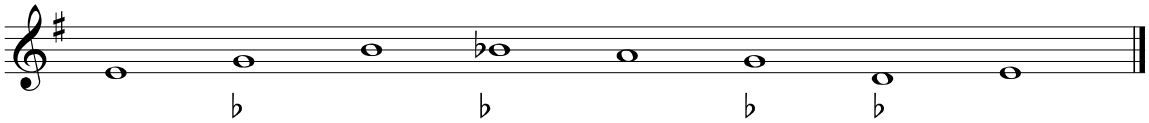
Back in the USSR (Lennon 1949-1980, McCartney1942-) dates from 1968. Surprisingly, the harmony of this song is not unlike the first blues I played. The key centre is G major (The Beatles used A major in the original recording). The form consists of a verse - eight bars, chorus - five bars and the bridge is 10 bars. The rhythm I choose for the left hand is very much a rock'n'roll cliché but it does show the intent of the original version. It is always difficult working in an idiom that is not piano-centred. Remember the contemporary popular song is essentially ensemble music. The piano, if it appears at all, usually has the minor role of harmonic accompanist. Our position as piano soloist must now reconcile the elements of rhythm, harmony and melody that were previously shared by multiple instruments. Each song should be carefully considered and like all transcriptions, some work whilst others do not.



Proud Mary (John Fogerty 1945-) dates from 1969. The original style of this song could be described as country rock. I choose however to play it the first time with a rock'n'roll rhythm and the second time with a jazz-rock feel, with a few added dominant sevenths. It is a very simple song which is reduced to the three dominant sevenths of the blues without actually following the blues form. Its length is eight bars in the verse and eight bars in the chorus.



Theme from the Pink Panther (Henry Mancini 1924-1994) appeared in 1964 and is a fun song to play. It has a wonderful structure of simplicity in rhythm, harmony and melody and is the perfectly constructed popular song. Its key centre is E minor, only three chords are required without alteration (Em-C7-F7) and its length is 16 bars.



When the Saints Go Marching In (trad.): Time permitting, I would like to play this old jazz and gospel standard. In its original form it has only three triads on I, IV and V. They are not dominant sevenths like a blues but they translate and function easily as such. For this version there are a few additional dominant sevenths.

CLOSING THOUGHTS

Popular song of the present time (21st Century): You often hear it said that 'they don't write songs like they used to'. My parents didn't enjoy the music and culture of the 1970s (my own teenage years) and I find myself having difficulty relating to much of contemporary popular music. My observation is that pop music tries to express the current culture. At a more organic level it also serves to balance the emotional needs of this culture. Perhaps what we found to satisfy does not work for the current generation. Technology has overtaken us at a very fast rate and I, for one, have trouble sending an e-mail, never mind dealing with the latest new thing. Could it be that their souls require something as simple as the music of rhythm in order to balance this complex world we now live in? Perhaps it is that old spirit of non-conformity, the rebel without a cause that drives our young people to reject the popular music of older generations or the even older music of past centuries.

The most predominant element in today's pop music is rhythm. From techno to the various house and rap styles, rhythm is paramount. Popular music is evolving or devolving toward its most basic forms.

Harmony is sparse and often uses nothing more than triads. Triads represent harmonic consonance at its simplest. It seems that dominant seventh harmony does not satisfy the emotional void that it once did.

In some styles melody has retained the technique of intoning around a given note. Such notes are not necessarily blue but perhaps just (meaning just intonation as defined by the harmonic series). The popular style rhythm and blues (R'n'B), which retains a strong connection to the black gospel tradition is the best example of blue notes being retained.

Mainstream popular music has also, to some degree, and depending on the artist, retained some of this character. It must be considered that melody is generally tethered with the yoke of 12 tone equal temperament as far as the harmonic accompaniment is concerned and so the voice or instrument will naturally gravitate towards it.

CONCLUSION

My final thoughts at this time confirm that the blues scale is a tangible link to our unresolved past. Its organic nature speaks to something that our unsatisfied emotions can recognise even though it is something not found in our inherited European culture. It seems however that there is more to it than just the blues scale. Something is wrong in Musical Camelot and its recognition and adjustment is urgently required. The future is dependent on its resolution.

I hope I have given you something useful to consider.

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About the Author:

Phillip Pedler Completed a performance Diploma in Jazz at SACAE (now part of Elder Conservatorium) in 1984. Since then he has worked in nightclubs, casinos and hotels throughout Australia in various bands and ensembles in the world of popular commercial music. He has accompanied the young talent team in concert and toured regional South Australia with Normie Rowe. He began teaching contemporary popular piano in 1997 in schools and privately and is about to release a new series of tutor books dealing with these styles and uniquely presented in the form of exercise and study.