

Two Approaches to Tonal Space in the Music of Muddy Waters

Curry, Ben

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BEN CURRY

Two Approaches to Tonal Space in the Music of Muddy Waters

Introduction

The music of Muddy Waters is steeped in the blues tradition of the early twentieth century but also plays a key role in the development of the rock music of the 1960s and 70s. The important place of Waters' music can be understood more fully by exploring its engagement with the harmonic and melodic characteristics of the blues. This article posits two approaches to blues tonal space: the networked approach and the laddered approach. The first is underpinned by the cyclical potentiality of equal temperament and is characterised by descending chromatic motions. The second is underpinned by the harmonic series and is characterised by microtonal shaping of pitch content within the framework of a ladder that approximates an equally-tempered major minor-seventh chord.

Having explained the detail of these approaches with reference to an early blues recording of Alberta Hunter and Fats Waller, the article goes on to look in detail at how Muddy Waters favours the laddered approach to tonal space, but also develops novel ways of referencing the networked approach, often through combining or synergising aspects of each. Discussion on these points provides insight into the potential for interchange between networked and laddered tonal space in the blues. This interchange is centred on the structural importance of the major minor seventh chord, the special weight afforded the sonority of the minor third and the affinity between microtonal and semitonal melodic motion in the blues.

Blues Tonal Space 1: The Networked Approach

Alberta Hunter and Fats Waller's recording of Clinton A. Kemp's 'Stingaree Blues' was recorded in 1923 soon after it was copyrighted by Handy in 1920 (Handy [1926] 1972). In Hunter and Waller's recording we find three closely related harmonic procedures, all of which respond particularly well to analysis in relation to a pitch network. The first occurs in bar 3 of the song and is characterised by the descending diminished chords moving by half step shown in the reduction in Ex. 1. The same voice leading process is deployed to close the song (Ex. 2).¹ The inner pedal C is a common feature of this succession in the blues, but is omitted from the reduction here to aid recognition of the three descending chromatic lines.

Ex. 1 Bar 3 of Hunter and Waller's recording of 'Stingaree Blues'

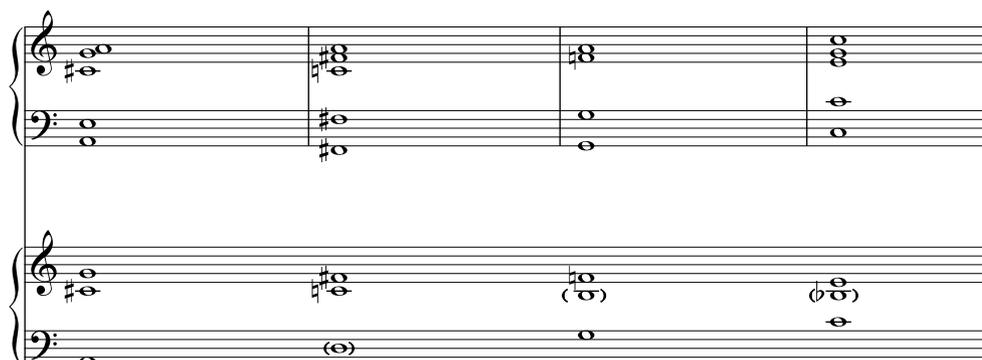


Ex. 2 The closing bars of Alberta Hunter and Fats Waller's recording of 'Stingaree Blues'



The second closely related harmonic procedure underpins the verse and is a version of the so-called ragtime progression. This is shown in Ex. 3, with voicings derived from the sheet music arrangement. In the ragtime progression the relationship with the cycle of fifths is made explicit. The descending chromatic voices remain key and are again sounded or implied as outlined in the lower stave of Ex. 3. The Bb that forms a seventh in the final chord is particularly important to recognise as a stable component of the blues and can therefore be said to be implied whether sounded or not.

Ex. 3 The harmonic succession in the first four bars of the verse of 'Stingaree Blues', as it is articulated in Handy's sheet music arrangement ([1926] 1972)



A third harmonic procedure is articulated in the chorus. It is the chord succession most commonly associated with the blues: the twelve bar blues. The reduction in Ex. 4 highlights the chromatic voicings articulated or implied by this progression again drawing on the sheet music music arrangement of ‘Stingaree Blues’. Notable here also is a more surface level chromatic motion in bars 23-24 (highlighted by a square bracket) that mirrors the lowest voice in the reduction in Ex. 2, but is operating here to articulate IV moving to V rather than a cycle beginning and ending on I.

Ex. 4 The chorus of ‘Stingaree Blues’, Handy’s sheet music arrangement, bars 19–29

The image displays two systems of musical notation for the chorus of 'Stingaree Blues'. The first system covers measures 19 to 24, and the second system covers measures 25 to 29. Each system includes a vocal line with lyrics and a piano accompaniment. The piano part features a series of chord reductions, with some measures containing triplets. The lyrics for the first system are: 'Woke up this morn-in' woke up this morn-in' Heard some-bod-y call-in' me, woke up this morn-in' Heard some-bod-y call-in'. The lyrics for the second system are: 'me It must have been my Sweet Pa - pa Sting-a - ree'. The piano accompaniment consists of a treble and bass clef staff, with the bass clef staff showing a chromatic progression of chords.

The voice leading processes highlighted by each of the reductions in Exs 1 to 4 suggest goal-oriented motions, whereby parallel chromatic voice leading is drawn with some inevitability to a close. However, I would argue that a spatially oriented analysis of these passages, one that draws attention to the network patterning of this music, affords us a different perspective.

Consider, then, Ex. 1 in relation to that portion of the Tonnetz formed by the total chromatic (Fig. 1). Each of the diagonals articulating minor third relations are labelled as a level – an approach to terminology derived from the work of Kubik and van der Merwe (see van der Merwe 1989, p. 209 n. 6). For each level, I introduce the possibility of a semitone substitution. This approach is found in Cohn (2000, p. 91 and 2012, p. 151).^{1b} Cohn’s work in this area, which develops the theories of Weitzman and Boretz, is drawn into the field of popular music by Capuzzo (2006, para 2.2–2.3).² In the blues a level is usually articulated with just two or three

notes and the root and minor ninth are never sounded simultaneously. The minor ninth in level I (Db in Fig.1) is rarely sounded, but forms a necessary theoretical component of the network. This is particularly important in the case of the ragtime progression where a shifting of the root/minor ninth substitution through the network allows that progression to be theorized as a continuous cycling through levels (see Fig.2).

Fig. 1: That portion of the Tonnetz formed of the complete chromatic with the root/minor ninth interchangeability indicated for each level

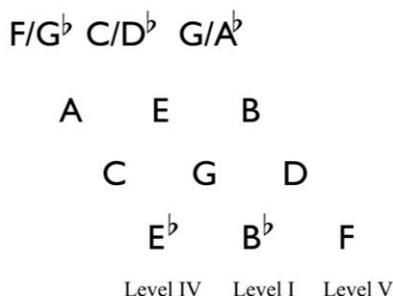
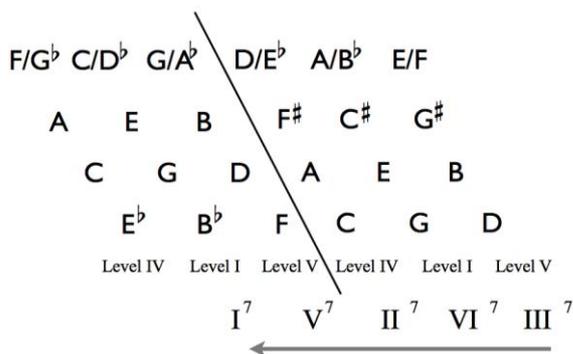
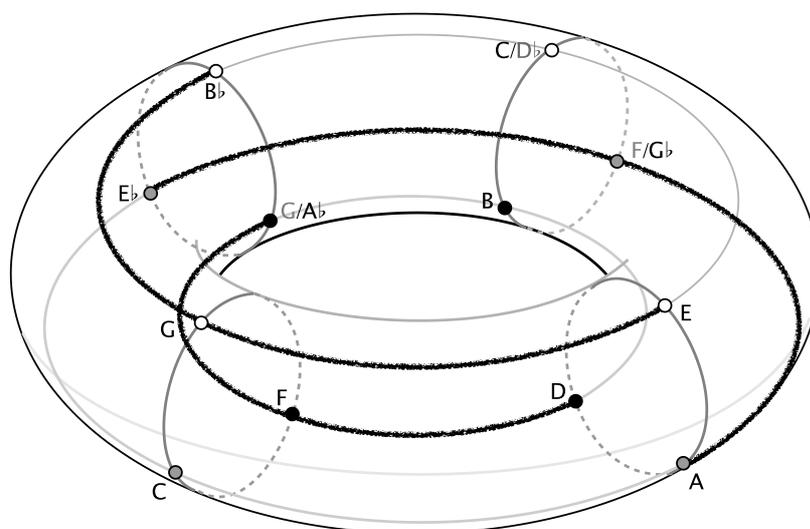


Fig. 2 The ragtime progression as a continuous cycling through levels with the minor ninth/root substitution shifted systematically



Compare the network in Fig. 1 with the reduction in Ex. 2. The reduction highlights levels IV (Eb, Gb, A, C) followed by level V (D, F, B) and then level I (C, E, Bb). A more common version of this progression begins with level I and is voiced: level I (E, G, Bb) – level IV (Eb, Gb, A) – level V (D, F, Ab) – level I (C, E, G).³ The cycling motion of this succession is made explicit if we plot the network in Fig. 1 onto a hypertorus. Notice that this common voicing of the progression appears as a semi-circular configuration (indicated by a fuzzy black line) that rotates through 180 degrees on the horizontal plane and 120 degrees on the vertical plane simultaneously, before closing with a final rotation onto C, E, G (Fig. 3).

Fig. 3 Pitch network diagrammed as points on a hypertorus with fuzzy black line indicating the cycling motion of the diminished chord succession.



The twelve-bar blues as articulated in Ex. 4 moves in one direction around the hypertorus in Fig. 3 and then the other, i.e. levels I – IV – I – V – I. However, that twelve-bar blues pattern that is common in the folk blues and comes to dominate urban blues practices, moves to level IV in the tenth bar of the succession giving levels I – IV – I – V – IV – I.⁴ This succession also moves in one direction and then the other around the hypertorus, but the sounding of level IV in bar 10 results in a complete cycle around the hypertorus at the end of the succession. This provides an alternative explanation for the logic of the V – IV – I cadence in the blues to those offered by Stoia and Everett.⁵

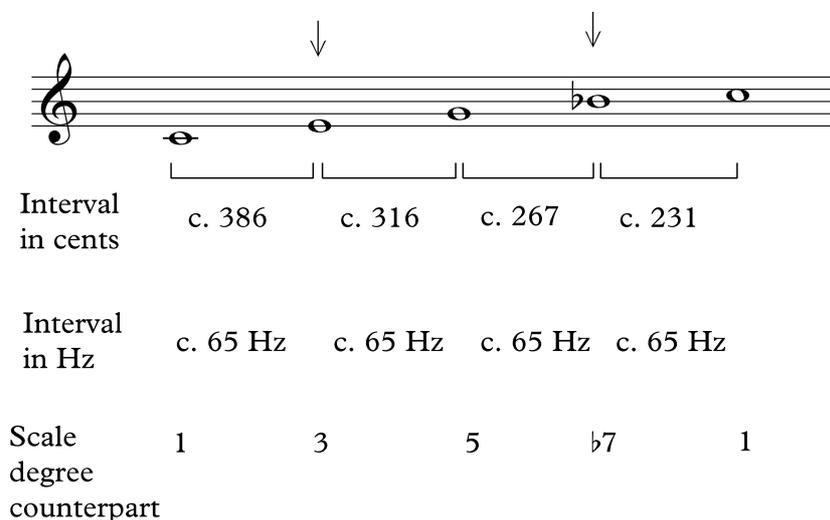
The networked approach to tonal space in the blues, then, can be understood as a cycling through tonal space, favouring chromatic stepwise motions. These cycles can occur at the structural level of the cadence (Exs 1 and 2) and at the structural level of a verse or chorus (Exs 3 and 4).⁶

Blues Tonal Space 2: The Laddered Approach

The laddered approach to tonal space in the blues is simpler than the networked approach in that the ladder is formed by a single series of pitches, but more complex in that pitches are subject to considerable variability and micro-tonal shaping, such that the notion of pitch-class, as conceived within the context of equal temperament, is stretched to breaking point.⁷ In fact the discrepancies between pitch classes in equal temperament and those in the laddered approach is such that we can usefully posit a logical underpinning or systematic model for the laddered approach that sets it apart from equally-tempered counterparts. This model is derived from the harmonic series and

thereby relies on integer steps of an equal number of Hz, rather than steps of an equal number of cents (as is the case in equal temperament). The ladderred model, then, can be diagrammed as shown in Fig. 4.

Fig. 4 Ladderred model of tonal space in the blues with arrows indicating pitches that deviate considerably from their equally-tempered counterparts



This ladder needs to be conceived flexibly. In ‘Stingaree Blues’, for example, the initial vocal phrase is clearly underpinned by a ladder of thirds: A – C – Eb as outlined by the black notes in the reduction in Ex. 5. This phrase has an important relationship with the ladder in Fig. 4, but it is not immediately obvious on paper. The A in the opening bars would seem to be a semitone too low and the same might be said of the Eb. The deviation from equal temperament in the model in Fig. 4 allows us to develop explanations for the variability of the ladder without necessarily resorting to the idea of blue notes and the problems this entails.⁸

Consider then the point that the Bb in the ladderred model is around 30 cents lower than its equally-tempered counterpart. Thus a singer’s deployment of the ladderred approach to tonal space in the context of an accompaniment that broadly adheres to equally-tempered pitch classes will allow that singer the possibility of articulating the fourth pitch in the ladderred model (scale degree counterpart b7) as either A, or as Bb, or somewhere between the two. For this reason it is significant that Alberta Hunter shapes the final A of the melody in this phrase so that it tends upwards towards Bb. This is indicated by the line in bar 2 of Ex. 5. This shaping recurs when Hunter repeats this phrase in the next four bars.

Ex. 5 Melody and harmonic outline of the opening bars of the verse of Alberta Hunter's 'Stingaree Blues' with reduction below

The image shows a musical score for the opening bars of the verse of Alberta Hunter's 'Stingaree Blues'. It consists of three systems of staves. The top system is the melody in treble clef, with lyrics underneath: 'I feel so sad to-day', 'My man has gone a- way', and 'My heart is full of pain'. The melody features triplet markings over the first two phrases. The middle system is a harmonic reduction in grand staff (treble and bass clefs), showing chords for the first three bars. The bottom system is another harmonic reduction in grand staff, showing chords for the last two bars, including a bar with a key signature change to B-flat major.

Like the Bb, the E in the ladder model is also lower than its equally-tempered counterpart. However, whereas the Bb in the ladder is 33 cents lower than an equally-tempered Bb, the E in the model is only around 14 cents lower. Furthermore the Eb in bar 3 of Ex. 5 tends downwards unlike the A that tends upwards. To explain the Eb in this context (without falling back on the notion of a blue third) it is useful to note a key principle in blues melodies; this is *a tendency to avoid a melodic interval of around 400 cents*, i.e. a major third. (The lowering of the Bb in the ladder model to A might suggest a related tendency to adjust narrower melodic intervals so as to approximate the minor third.)

Thus whereas the E in Fig. 4 is commonly articulated as part the interval G–E (5–3), the melodic interval E–C (3–1) is relatively rare. For example, I found only around fourteen instances of this latter interval in my account of the scale degree content of the first verses of the blues songs of Robert Johnson, and in all instances close examination suggests the intervals in question may be closer to the neutral third (approx. 350 cents) than the major third (400 cents). I found over seventy instances of the narrower interval Eb–C (b3–1) or neutral E–C (n3–1).⁹ Furthermore, ten of the fourteen instances of E–C (3–1) are interpreted by Ainslee and Whitehill, in their detailed transcription of Johnson's songs, as Eb–C (b3–1).¹⁰ Thus although a melodic interval that articulates the first two notes in the ladder model as a descending diad (E–C) does occur in the blues, it is usually open to interpretation as a narrower interval (due to micro-tonal shaping) and the lowering of the first note to form an interval closer to a minor third is extremely common.

This same principle of narrowing wide thirds can be observed in articulations of the second and third notes in the ladder model (E and G). While it is common to lower the E to a note closer to or even below an equally-tempered Eb, the interval G–Eb (5–b3) is generally avoided. This avoidance is usually achieved through one of three strategies. Firstly, the E may not be lowered, this is a particularly common strategy at the end of phrases (see Stoia 2014, p. 212).

Secondly, the E may be lowered to Eb but a passing note (F) added to avoid a leap of a major third. Thirdly, both the G and the E may be lowered to retain the narrower third – approximately Gb–Eb (b5–b3).

The ladder model of the blues, then, is rooted in the logic of the harmonic series, articulating, thereby, a ladder resembling a major-minor seventh chord (C–E–G–Bb–C). This basic model, however, is adapted in accordance with the principle of avoiding intervals approximating a major third in favour of narrower intervals, with intervals approximating the minor third being particularly common. This last point highlights an important overlap between the networked and ladder approaches to tonal space, both afford a major-minor seventh chord configuration a special status and place special emphasis upon an interval of (approximately) 300 cents (the minor third).

Tonal Space in the Music of Muddy Waters

The distinction between networked and ladder tonal space provides a useful lens in studying the music of Muddy Waters, particularly when addressing his music of the late forties and early fifties during which time we can identify a gradual shift towards riff-based songs. The sections that follow give an account of this period with particular reference to key recordings: ‘I Can’t Be Satisfied’ (1948) and ‘I Feel Like Going Home’ (1948), which formed the two sides of a single that provided Waters with his first commercial success; and the riff-based songs of the early 1950s, particularly the first of these: ‘Rollin’ Stone’ (1950). In addressing each of these songs I will consider the ways in which Waters deploys and/or synergizes the ladder and networked approaches to tonal space.

‘I Can’t Be Satisfied’

‘I Can’t Be Satisfied’, recorded with ‘I Feel like Going Home’ on Aristocrat (later Chess), represents a key moment in Muddy Waters’ career. The track sold in the thousands in Chicago and throughout the South immediately after its release in April 1948 and reached number 11 on the Juke Box and Best Seller R&B charts.¹¹ Both songs inhabit a soundworld that is characteristic of Waters’ recordings for the next two years or so, a point that derives, in part, from their stark instrumentation: Waters singing with slide guitar and Ernest ‘Big’ Crawford playing upright bass.¹² A version of ‘I Can’t Be Satisfied’ appears on the Lomax 1941 field recordings of Waters under the title ‘I Be’s Troubled’. I consider here the 1948 recording on Aristocrat.

Ex. 6 Introduction of 'Can't Be Satisfied' by Muddy Waters.

We saw in Alberta Hunter's 'Stinagaree Blues' the tactic of deploying an instrumental accompaniment that articulates a networked approach to tonal space, to accompany a vocal melody that articulates the laddered approach. This tactic is common in the blues and is surely largely derived from the limitations of common accompanying instruments that are more thoroughly bound by equal temperament, i.e. piano or finger-style guitar. Muddy Waters', however, following blues men such as Son House and Robert Johnson, makes extensive use of the bottle neck or slide guitar techniques and these allow him to use a laddered approach to both the vocal melodies and the guitar accompaniments in his recordings.

The opening figure of 'I Can't Be Satisfied' outlines the lower three notes of the laddered model in Fig 4. Henceforth, the notes of this ladder will be named after their major mode counterparts for simplicity of reference to give 1, 3, 5 and b7 (see Fig. 4). 'I Can't Be Satisfied' articulates 5, 3, 1, but, in accordance with the tendency to avoid melodic intervals of a major third, Waters opts for a 3 that is almost exactly half way between an equally-tempered 3 and equally-tempered b3. This B is sounded four times in the opening five bars and each time it involves microtonal shaping. By using the software Melodyne I have been able to obtain a reading of its average cents value in relation to equal temperament; thus the first four Bs above the stave can be classed as B -56 cents, B -44 cents, B -66 cents and B -28 cents – the last two notes being shaped by a single upward slide that together average around B -48 cents.¹³ Thus Waters, in this declamatory opening figure, can be heard to consistently approximate a neutral third between 1 and 5 as a means of avoiding any clear sense of a melodic major third.

The interval that follows this figure in a lower voice narrows the third further. It is notated here as Bb moving to G, and is reinforced by parallel fifths and octaves above when it first occurs in bar 2; this reinforcement recurs, but only partially, in bar 4. We again hear microtonal shaping but it is perhaps significant that Melodyne summarizes the Bb as sounding around 30 cents lower than an equally-tempered Bb, giving some credence to Kubik's claim that the interval between 1 and 3 can be narrowed to the extent that it approximates the interval between 5 and b7 (as I have identified them in Fig. 4) (Kubik 1999, p. 139). The parallel motion derives in part from the guitar tuning Waters' favours at this time (from lowest to highest string: D, G, D, G, B, D) and clearly anticipates the textures of 60s and 70s rock. This same sense of reinforcement recurs at bar 8 into bar 9.

A particularly prominent feature that follows is in the second half of bar 12 and the start of bar 13. Here 5 is sounded in the upper-mid register of the guitar and is reinforced by b7 above it (giving the minor third D and F). Both notes, however, are sounded around 50 cents below their equally-tempered counterparts and gradually descend to form Db and Fb in bar 13. This descent avoids the sounding of a melodic major third as it narrows the intervallic move from the Db to Bb that follows. Thus Waters in this introduction gives a prominent role to the ladder of thirds, and places particular emphasis (bars 1 and bars 12-13) upon tactics for avoiding the major third, including the use of the neutral third and the lowering of 5 before it moves to b3.

When the vocal enters in bar 23 it forms a heterophonic texture with the guitar. At times the tactic for circumnavigating the major third can be different in each part at any given point. For example, the opening guitar figure recurs in bar 24, again with the prominent use of the neutral third, at the same time the voice tends to lower 5 to b5 and articulate a note closer to b3. Thus we find in Waters the possibility of heterophonically combining microtonal shaping of the ladder of thirds to create a surface that is richly textured through microtonal detail.

I have notated 'I Can't Be Satisfied' as a 24 bar blues with the contraction of the second half of the second line (bars 13-15 inclusive) to give a 23 bar blues. Thus each two-bar unit can be considered a single bar within a standard twelve-bar pattern. With the suggestion of IV in the guitar (although not in the bass) at bar 9 and V in bar 16, the standard twelve-bar changes are in evidence but it is notable that there is little sense of the chromatic motions afforded by the networked approach to the twelve-bar progression. 'I Can't Be Satisfied' might be said to draw determinedly upon the ladder approach to blues tonal space and this both creates a sense of connection (so often highlighted by commentators) with the folk blues that was important to Muddy Waters' early development as a musician, but also anticipates his riff-based accompaniments of the 1950s.

'I Feel Like Going Home'

While 'I Can't Be Satisfied' deploys the laddered approach to tonal space to the exclusion of the networked approach, the same cannot be said of the track released on its flip side. 'I Feel Like Going Home' focuses upon the laddered approach to tonal space and many of its figures are closely related to those in 'I Can't Be Satisfied', but Waters also integrates aspects of the networked approach such that clear points of contact are drawn with the tradition of blues harmonic practice that stretches from Handy's early blues publications, through the recordings of the blues queens and the smooth urban blues of Leroy Carr, to the sophisticated folk blues of Robert Johnson.

Ex. 7 'I Feel Like Going Home', opening guitar solo

The image shows a musical score for the opening guitar solo of 'I Feel Like Going Home'. It is written in 4/4 time with a key signature of one sharp (F#). The score is divided into four systems, each starting with a measure number (1, 4, 7, 10). The notation includes various rhythmic patterns, primarily triplets, and uses a laddered approach to tonal space. The first system (measures 1-3) features a series of eighth-note triplets on the first string, moving up the fretboard. The second system (measures 4-6) shows a chromatic descent on the first string, with triplets and a change in fretting. The third system (measures 7-9) continues the chromatic motion with more complex triplet patterns. The fourth system (measures 10-12) concludes the opening with a final triplet pattern and a chromatic slide.

'I Feel Like Going Home' begins with a figure that closely resembles the opening of 'I Can't Be Satisfied' (see Ex. 7). The tempo is now far slower, but again notes 5, 3 and 1 form a melodic framework, and again the minor third is circumnavigated in the sounding of 3 as a neutral third above 1. At this point, however, Waters introduces a striking feature that I have not found in any earlier recordings. The neutral third is now given declamatory weight as a harmonic interval and sounded with more distortion.¹⁴ A chromatic motion follows as the neutral third, formed we can assume by angling the slide across the second and third strings, is shifted down the guitar (Ex. 7, bars 4–5). This chromatic motion clearly relates to those motions described in this article in

terms of a networked approach to tonal space. However, there is some need for qualification here. The obvious point of reference for this figure is Robert Johnson's 'Kind-Hearted Woman' (1936) and certain other of Johnson's songs in this mould.¹⁵ The chromatic motion that approximates 8–7–b7 when followed by IV, is easily heard in functional terms: as I – V7 of IV – IV. Such an analysis cannot be dismissed out of hand, but consider the point that the b7 of V7 of IV has, in the case of 'Kind-Hearted Woman', already been sounded in the accompaniment, and that b7 is, in any case, arguably always implied in blues tonal space. Furthermore, such functionality would surely be entirely undermined in the context of parallel neutral thirds as is the case in 'I Feel Like Going Home'.

A different reading is possible. The chromatic motions discussed above in relation to networked tonal space are closely related to the laddered approach in two respects. Firstly, both afford the possibility of the major-minor seventh chord (or a justly-intoned version of it) as a primary structural arbiter. Secondly, they both provide the framework for very small pitch movements: semi-tonal movements in the case of networked space and microtonal movements in the case of laddered space. Chromatic motions between notes of the ladder generally create a sense of reconfiguring tonal space to form the more cyclical arrangement formalised by the hypertorus in Fig. 3. This is the case when moving, in particular, from b7 to 5, or from 5 to 3, or when both of these motions occur simultaneously. However, a chromatic motion from 8 to b7, through its resemblance to these more common chromatic motions, creates a similar sense of cycling even though its elaboration of tonal space lacks the interpretative scope outlined in Fig. 3. Waters brings a new light to this chromatic motion by harmonizing it with the neutral third that will strike the uninitiated listener, more used to the framework of equal temperament, as harshly out of tune. Thus in combining chromatic motions and neutral thirds Waters draws novel connections between the networked and laddered approaches to tonal space in the blues. The emphasis brought through the distorted guitar timbre underlines the novelty and assurance of this gesture.

The 8–7–b7 chromatic descent is echoed at the end of the introduction of 'I Feel Like Going Home' by the more common b7–6–b6–5 (Ex. 7 bars 11–12). The latter more directly implies the progression diagrammed in Fig. 3 giving a strong sense of cyclical motion to this turnaround gesture. Also notable is the elaboration of the tonic pedal that commonly accompanies these chromatic motions with a major third that is slightly narrower (c. -20 cents) than its equally-tempered counterpart. This also suggests some integration of laddered and networked approaches.

Ex. 8 Vocal entry of 'I Feel Like Going Home'

The inventive and, at times, subtle integration of tonal spaces in ‘I Feel Like Going Home’ may, at first, seem to stand in stark contrast to the raw declamatory guitar work of ‘Rollin’ Stone’. ‘Rollin’ Stone’ was recorded on Chess in 1950 and despite its limited commercial success, it is often noted as a particularly significant work in Muddy Waters’ development. This can be explained by a number of factors. Firstly, the name of the track, with slight variation, was adopted by the leading popular music magazine (*Rolling Stone*) and a leading rock group (The Rolling Stones) of the 60s and 70s. Secondly, the release of ‘Rollin’ Stone’ coincides with the rebranding of the record label Aristocrat as Chess. Thirdly, a version of the song title ‘Still A Fool’ did achieve considerable commercial success in 1951, positioned 9 on the Juke Box R&B chart for three weeks. Perhaps the most important factor, however, is a musical one. ‘Rollin’ Stone’ introduces a riff-based approach to song form that can be taken to mark a new departure in Waters’ work.²⁰ This riff-based approach, at the level of medium and large-scale organization, sets the song apart from ‘I Can’t Be Satisfied’ and ‘I Feel Like Going Home’ and the songs in their their mould. In terms of its approach to tonal space, however, there is considerable continuity between Waters’ riff-based songs and his earlier recordings; analysis in terms of the treatment of tonal space is again a useful tool here.

Ex. 9 shows the opening bars of ‘Rollin’ Stone’. We can note that the song, as in Waters’ other riff-based songs, deploys the technique of subtly varying the basic riff each time it is sounded. These subtle variations often escape notation, but they are clearly important to the soundworld. It is still possible, however, to discern a basic notated outline for the riff that dominates ‘Rollin’ Stone’ and Waters’ other riff-based songs. Fig. 5 indicates the basic melodic outlines of the riffs used in these songs during the early 1950s. These songs adhere to the logic is that of the laddered approach to tonal space with 1, 3/b3, 5/b5 and b7 all appearing prominently. The key principle of avoiding melodic major thirds is again in evidence. The strategies for achieving this, however, appear to be more limited. The third is lowered to around b3 in almost all of these riffs – the exception is ‘Just Make Love to Me’ (1954), where closing on 3 avoids a falling major third (A – F# instead of A – F) on a higher structural level. In order to avoid a major third between 5 and b3 the passing note, 4, is very common indeed and, in certain contexts (‘Louisiana Blues’ (1950), ‘Mad Love’, (1953) and ‘Mannish Boy’ (1955)) even begins to be afforded a new structural importance. In Waters’ riff-based songs, then, there is perhaps some sense of a melodic palette that tends to solidify around the minor pentatonic. But we need to be cautious with such claims, I suggest. This is, not least, because, in addition to the #4/b5 that is usually admitted as an exception to the minor pentatonic, we also have 6 in ‘Louisiana Blues’ and ‘I’m A Natural Born Lover’ (1954), and 3 (not b3) in ‘Just Make Love to Me’, and these pitches

do not sound in any sense alien to the governing palette – quite the contrary. For these reasons, I suggest that the laddered conception of tonal space remains a more insightful analytical tool in analysing the riffs in Fig 5.

Ex. 9 'Rollin' Stone', opening bars.

The image shows a musical score for the opening bars of 'Rollin' Stone'. It consists of two systems of staves. The first system has a Voice staff with the lyrics 'Well I' and an Electric Guitar staff with a triplet of eighth notes. The second system has a Voice staff with the lyrics 'wish I was a cat-fish' and an Electric Guitar staff with a triplet of eighth notes. An arrow points to a specific note in the guitar staff of the second system.

Fig 5. Melodic outline of riffs in Muddy Waters' songs of the early 1950s. Where the riff occurs on harmonica and guitar simultaneously the less prominent part is shown with smaller noteheads.

The image shows a musical score with seven lines of riffs. Each line is labeled with a song title. The riffs are: 'Rollin' Stone' & 'Still A Fool', 'Louisiana Blues', 'She's Alright', 'Mad Love' & 'Mannish Boy', 'I'm Your Hoochie Coochie Man', 'Just Make Love to Me', and 'I'm a Natural Born Lover'.

Muddy Waters' riff-based songs, like 'I Can't Be Satisfied' before them, clearly focus upon the laddered approach to tonal space. Both accompaniment and vocal melody adhere to the logic of the ladder in Fig. 4 with passing notes and extensive microtonal shaping bringing interest. Furthermore, a number of Waters' riff-based songs of the early 1950s do not outline a twelve-bar blues structure or any clear adaptation of it. There is perhaps something of a return to the one-chord blues in songs like 'Rollin' Stone', 'She's Alright', 'Mannish Boy' and 'I'm a Natural Born

Lover’. Songs that do outline a twelve-bar blues structure, however, suggest, to my ears, something of the chromatic structural underpinning described by the reduction in Ex. 4. This is particularly true of ‘Louisiana Blues’ where the richer instrumentation of two guitar, piano and harmonica tends to imply or articulate the key chromatic motions of the blues.

‘I’m Your Hoochie Coochie Man’ (1965) also suggests a twelve-bar blues-like structure while placing special emphasis upon the riff outlined in Fig. 5. This may be taken to suggest chromatic structural motions as in ‘Louisiana Blues’, but in ‘I’m Your Hoochie Coochie Man’ there is also more surface-level chromaticism. Fig. 6 gives a reduction of the turnaround at the end of the first verse of ‘I’m Your Hoochie Coochie Man’. The point of the recording that this reduction represents is particularly complex and difficult to discern in detail. With the help of computer software, however, we are able to recognize two distinctive chromatic motions, the first from 3 to 5, which is partially reinforced by minor thirds above it and the second, overlapping with this, descending from b7 to 5. These motions suggest the networked approach to tonal space and align with the chromatic motions set out in Exs. 1 and 2 and diagrammed by the hypertorus in Fig. 3.

Fig 6. Reduction of turnaround at end of verse 1 of ‘I’m Your Hoochie Coochie Man’



Further insight is gained from Fig. 6 when we consider how the glissando from D to E, in the middle of the reduction, echoes the preceding chromatic motion from D, through D#, to E. This brings home a vital point in understanding the integrity of the blues. The chromatic motions of networked space can be closely related to the microtonal shaping of ladder space and this allows a sense of interchange and integration of the approaches. This happens particularly clearly in the turnaround of ‘I’m Your Hoochie Coochie Man’, but it is an important aspect of blues musical language more generally. Thus, when, as in this turnaround, blues performers articulate musical ideas within a blues framework, there is a ready affinity for chromatic and microtonal melodic movement. One further example from ‘Rollin’ Stone’ will serve to indicate Waters’ ability to exploit this dimension of the blues in novel but subtle ways.

Ex. 10 ‘Rollin’ Stone’ bars 22 to 25 with reduction to indicate chromatic descent at a higher structural level.

The image shows a musical score for four bars (22-25) of the song 'Rollin Stone'. It consists of three staves: Voice, Electric Guitar, and a lower staff (likely Bass or another instrument). The key signature is three sharps (F#, C#, G#).
 - **Voice Staff:** Shows a melodic line with lyrics: 'Her hus-band just now left', 'Sure e-nough just now left', and 'Sure e-nough just now left'. There are triplet markings (3) over the notes in bars 22, 23, and 24. A downward arrow with '25' indicates a slide or breath mark at the start of bar 25.
 - **Electric Guitar Staff:** Shows accompaniment with chords and a melodic line. It includes a slide guitar technique in bar 25.
 - **Lower Staff:** Shows a single melodic line, possibly for a bass instrument, with a long note in bar 25.

Ex. 10 shows bars 22 to 25 or ‘Rollin Stone’. These vocal figures form the second half of the second four-bar phrase of each verse. The basic materials are strikingly simple and there is a sense of stasis at this point in the song. But the simplicity of this passage serves as a useful platform for Waters’ detailed microtonal shaping around each of the notes that close each subphrase: in this verse the notes that set the word ‘left’. In each verse Waters’ subtly shapes these notes in relation to one another forming a line at a higher structural level. In all but one case this line descends,²¹ and in verse two this descent can be particularly clearly related to the chromatic descents that characterize the networked approach to tonal space. Thus Waters, again, finds ways to occupy a space that stands at the intersection between laddered and networked approaches.

Conclusion

The music of Muddy Waters stands at an important juncture in the history of popular music. His strategic use of distorted guitar timbres, his use of parallel harmony to reinforce distinctive melodic motions and his development of riff-dominated textures all anticipate the rock practices of the 1960s and 1970s. His music, however, is also deeply indebted to blues traditions of the early twentieth century.

The theory of two approaches to tonal space in the blues developed in this article provides an insightful means to open up the details of Muddy Waters music. His music demonstrates a clear focus upon the laddered approach to blues tonal space with the extensive use of slide guitar techniques allowing Waters a striking level of control over microtonal details, but there are also numerous points of contact between Waters’ music and earlier blues accompaniments that articulate a networked approach to blues tonal space. Waters finds subtle and inventive means of drawing in the cyclical chromaticism that I have argued can be usefully conceived in terms of the hypertorus in Fig. 3.

Waters music also underlines the important sense in which the laddered and the networked approaches are intimately connected. Both posit the major minor seventh chord as a central structural arbiter and both explore way of elaborating this chord through small-scale melodic

motion (semitonal in the networked approach or microtonal in the laddered approach). Both also place special emphasis on the minor third and can be seen to involve substitution processes as a result (the minor ninth/root substitution in the networked approach and the principle of narrowing thirds towards the minor third in the laddered approach). Waters' music will often exploit this potential for interchange such that novel formations are developed that, nevertheless, show a deep appreciation and assimilation of a rich tradition.

Waters music should remain a touchstone for novelty and innovation in rock music, but it should also be recognized as music that is deeply invested in the intricacies and subtleties of blues music. Its analysis in terms of contrasting but interpenetrating mappings of tonal space provides a useful means of understanding this remarkable achievement.

NOTES

1. In this article I follow Stoia (2013) in transposing examples to C to aid comparison and accessibility. However, in discussing the music of Muddy Waters the importance of the physicality of the guitar has led me to transcribe his music in the original key.

1b. In *Audacious Euphony* (2012) Cohn notes how the Boretz spider connects a diminished seventh chord to four dominant seventh chords through semitonal substitution, thus the diminished seventh chord E, G, Bb, Db yields four dominant sevenths on each of the following Eb, Gb, Bb and Db. This process forms four legs of the Boretz spider, the other four legs derive from semitonal substitution upwards giving four half-diminished seventh chords. The most important affinity here between my work and Cohn's concerns his assertion, following Boretz that 'fully diminished seventh chords and dominant seventh chords stand in a substitutional relation' (2012, p. 151). There are also possible points of contact in Cohn's wish to 'take dissonant harmonies as they are, rather than reducing them to something simpler and more familiar [i.e. major and minor triads]' (p. 149). More insightful still is Cohn's claim that the diminished seventh chord in a Boretz Spider is like the augmented chord in a hexatonic cycle or Weitzmann region in that it 'asserts a virtual power over that system even when absent from the musical surface' (p. 153). Cohn appears to conceive the abstract qualities (evenness, symmetry, uniformity of interval content) of augmented chords and diminished chords as key in understanding their 'virtual power'. In the context of the blues these abstract qualities can be understood as a means of reconciling fundamentally different pitch organising systems within the context of a broader cultural syncretism.

2. Capuzzo cites Cohn and Weitzman in positing the total chromatic as 'the cross product of diminished seventh chords and augmented triads'. He goes on to demonstrate how the notion of semi-tonal substitution found in the work of Cohn has an 'exact parallel' in the theoretical work of jazz guitarist Pat Martino (2006, para. 2.3). For a more general account of the insight offered by spatially-driven theoretical approaches to the study of popular music harmony see Capuzzo (2004).

3. This version of the succession begins a number of Robert Johnson's songs (e.g. 'Kind Hearted Woman' (1936), 'Phonograph Blues' (1936) and 'Dead Shrimp Blues' (1936)). A particularly early manifestation is in the song '(You're the Flower of my Heart) Sweet Adeline' (1903), and for this reason Phillip Tagg has dubbed the succession an 'Adeline slide' (Tagg 2003, p. 209–10)

4. In his ground breaking study *Urban Blues*, Charles Keil notes that a 'subdominant substitution in the tenth bar occurs in almost all non-country blues' (Keil 1966, p. 52). This succession is

found in much country blues also, including, for example, the majority of Robert Johnson's recordings.

5. Everett conceives chord IV in this progression as an embellishment of V (Everett 2008, 154). Stoia suggests that the progression 'emphasizes the cadence by approaching the final tonic from both its upper and lower dominants' (Stoia 2013, p. 209). See also Stoia (2010, para. 16 and n. 18). My position is closer to Stoia's but in using the notion of level instead of chord and emphasizing cyclical rather than goal directed motions, I am looking to mark out a further distance between blues music processes and those traditionally conceived as tonic, dominant and pre/subdominant functions.

6. Note that in 'Stinagree Blues' the ragtime progression does not constitute the entire verse. However, there are countless songs where the ragtime progression does exactly that, e.g. Arthur 'Blind' Blake's 'West Coast Blues' (1926).

7. Important contributions to our theoretical understanding of microtonal shaping in the blues are found in Evans' notion of 'tonal areas' (Evans 1982, p. 24) and Titon's concept of the E, G and Bb complex (Titon, 1994 [1977], p.153–54).

8. For an account of the difficulties entailed by reinscribing the idea of the blue note see Weisethaunet (2001). See also Curry (2015).

9. See Curry 2015, p. 247 and 248.

10. See Ainslee and Whitehall (1992). Classification of these intervals was not straightforward as it was not simply the case that the third degree was subject to microtonal lowering but also that the tonic note may be subject to microtonal raising. Furthermore, notes are usually given distinctive shaping through microtonal manipulation rather than simply lowered or raised.

11. See Tooze (1997, p. 84).

12. It is generally recognised that Muddy Waters' sound on record around this time stands can be contrasted with the sound of his group live. Chess were reluctant to allow Waters to perform with his band and stuck to the stripped back instrumentation that had been successful on 'Can't be Satisfied'/'I feel Like Going Home' until 1950 (See Tooze 1997, p. 94).

13. The software package Melodyne is primarily designed to use in studio recording to enable detailed manipulation of recorded performance, particularly the process of 'tuning' voices. The sophistication of Melodyne also renders it an ideal tool in the analysis of the microtonal details of blues music.

14. It is perhaps notable that this use of distortion predates those uses usually cited as first examples, e.g. Ike Turner's 'Rocket 88' (1950) and Goree Carter's 'Rock Awhile' (1949).

15. There are around six further songs in this mould, of these two clearly articulate a comparable harmonic figure: 'Phonograph Blues' and 'Dead Shrimp Blues'.

16. I use the label C# here when the pitch subsequently moves upwards and Db when it subsequently moves downwards.

17. It is perhaps notable that the guitar part of 'I Feel Like Going Home' as indicated in Ex. 7 has multiple instances of melodic major thirds between Bb and D. This may seem to undermine my claim around the principle of narrowing major thirds, but there at least are three important

qualifications here. Firstly, the principle is a tendency not a hard and fast rule. Secondly, the major thirds between B \flat and D are not generally given gestural weight in the way that the minor thirds are. Thirdly, the major thirds are not straight forwardly declaimed in that the microtonal slide around the B \flat calls into question the classification of this interval as a major third.

18. See Wald (2004, p. 136)

19. Few songs in Muddy Waters' early recordings overtly draw on/adapt 'I Can't be Satisfied', one clear example is 'You're Gonna Miss Me' (1948). Songs drawing on 'I Feel Like Going Home' are more numerous and include: 'Streamline Woman' (1948), 'Little Geneva' (1949), 'Canary Bird' (1949), 'Sad Letter Blues' (1950), 'Appealing Blues (Hello Little Girl)' (1950) 'Too Young to Know' (1951), 'Who's Gonna Be Your Sweet Man' (1952) and 'Sad, Sad Day' (1953). Note that dates indicate the year the recording was made.

20. Such a claim is suggested in Robert Gordon's book on Waters' when he writes 'They'd been singing "Catfish Blues" for years in the Delta, but it never sounded like 'Rollin' Stone' (Gordon 2003: 1001). See also George (1983).

21. The exception is verse 3 where there is a sense that Waters' voice drops so low on the second iteration of 'stone' that the third iteration is radically rethought with a considerably higher note and large amounts of vibrato. The outcome is a micro-tonally high A (c. A+30 cents) a micro-tonally low A (A-30 cents) and a microtonally low A# (A#-30) with a strong vibrato.

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Abstract

This article posits two approaches to blues tonal space: the networked approach and the laddered approach. The first is underpinned by the cyclical potentiality of equal temperament and is characterised by descending chromatic motions. The second is underpinned by the harmonic series and is characterised by microtonal shaping of pitch content within the framework of a ladder that approximates an equally-tempered major minor-seventh chord.

Having explained the detail of these approaches to tonal space with reference to an early blues recording of Alberta Hunter and Fats Waller, the article goes on to look in detail at how Muddy Waters focuses upon the laddered approach to tonal space, but also develops novel ways of referencing the networked approach and of finding synergies between networked and laddered approaches. Discussion on these points provides further insight into the potential for interchange between networked and laddered tonal space in the blues. This interchange centres on the structural importance of the major minor seventh chord, the special weight afforded the sonority of the minor third and the affinity between microtonal and semitonal melodic motions.

Note on Contributor

Ben Curry is Lecturer in Music at the University of Kent. He received the PhD from Cardiff University with a dissertation concerning the application of Peircian semiotics to music. He has given research papers on music semiotics and the analysis of popular music at conferences in the UK and elsewhere in Europe. He has published articles in *Popular Music*, *Twentieth-Century Music* and *Studies in Musical Theatre*.

