Kotekan - *the technique of interlocking parts in Balinese music*

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Introduction
One of the most striking features of Balinese gamelan music - especially the modern gong kebyar orchestra - is kotekan, the rapid interlocking figuration that permeates nearly all kebyar compositions.[Footnote 1] It creates a unique sonic impression: a group of gangsa (bronze metallophones) struck with hard wooden mallets produce an intricately patterned layer of sound above the more sustained tones of the lower instruments; the reong, a row of small tuned gongs played by four musicians, creates a different (but equally complex) figuration of a softer attack and sound color; and leading them all are a pair of drummers who play yet another kind of interlocking figuration.

Perhaps the most startling aspect of this polyphony is the extreme tempo of the music, which seems to reach beyond human capabilities. The streams of notes are so wildly rapid, and in such a profusion of melodic shapes, that - coupled with the incisive metallic timbre of the instruments - it seems to many upon first hearing to be the sound of a machine, some frenetic music box set to twice its normal speed.

Experiencing a live performance by a Balinese gong kebyar gamelan, one finds that the players (normally about twenty-five) are producing this mass of sound through a rhythmic synchronization of musical parts. Despite the seamlessness of the figurations, it is clear that their mallets are falling at different moments. Looking closely at an individual player, one can see that he [Footnote 2] is playing a subset of the total rhythmic matrix: sometimes every other tone, but just as often groups of two or three notes in a wide variety of patterns. Other players are fitting a different, complementary part in and around the spaces of the first, together producing the complete figuration. One might imagine, as an analogy, the text on this page being read by two narrators, one of whom pronouncing only the letters a through m, and the other n through z, yet fitting those sounds together so perfectly that we hear them as one speaker.

Kotekan is almost certainly a modern technique, developed with the advent of the dynamic kebyar style around the turn of the century. The emergence of that style, with its abrupt and even explosive changes of mood, dynamics, and tempo (compared to the relatively steady and stately tempos of previous music) and highly florid patterns of melody and figuration, inspired a fundamental reorientation in the instrumentation and performance of Balinese gamelan. The instruments were expanded in range and streamlined to permit a faster playing style (during that time many of the older, massively built gong gede gamelan were melted down and reforged into kebyar style instruments) and a wealth of new playing techniques were developed, not least among them kotekan. While the orchestra musicians of Paris were struggling to perform the changing meters and strange new playing techniques of Stravinsky's The Rite of Spring, the Balinese were engaged in their own musical revolution, working out the intricacies of interlocking parts.

The Instruments

The techniques of kotekan are applied to three different sections of a Balinese gamelan gong kebyar; the gangsa, reong, and *kendang* (drums). The gangsa are the most prominent within the total sound of the gamelan (they form the largest single family of instruments, and have the most incisive timbre) and they also tend to carry the primary melodic thread in a *gong kebyar* composition. The principles of kotekan for the gangsa parts apply as well to the other two groups of instruments, with relatively minor adjustments.

In most modern gong kebyar gamelan, gangsa are ten-keyed bronze metallophones [Footnote 3], with each key suspended (usually by leather straps fitted through holes on either end of the key) over a bamboo resonating tube. When properly tuned, the resonance of the tube adds enormously to the sound of the bronze key, enhancing the fundamental tone. The sustained portion of this tone is considerably lengthened as well: if left to ring, a single tone may last over a minute before fading. The effect of the resonance can be demonstrated by placing a small piece of paper between the key and the top of the bamboo. With the resonator thus decoupled from the bar, one hears that the sharp attack sound remains strong, but the fundamental is barely audible, and fades quickly. Both elements of the soundÑthe bright percussive attack, with its many overtones, and the resonant and

highly sustained fundamental tone - are important in kotekan.

The ten keys of each gangsa span two octaves of the pentatonic (5-tone) scale used in most Balinese music, known as *pelog*. This scale can be notated approximately as in figure 1. [Footnote 4]

In most gamelan gong kebyar, there are a total of eight gangsa involved in performing kotekan: four *pemade* and four *kantilan* (tuned one octave higher than the pemade). In each group of four, two instruments are assigned to each kotekan part. Thus the two melodic strands of a kotekan are doubled both at the unison and the octave, creating a rich and penetrating sonority within the orchestral palette.

The timbral complexity is further enhanced by the "paired tuning" system, which is applied to all of the metallophones in a Balinese gamelan. In this system each instrument has a partner instrument, tuned slightly higher or lower. A tremolo (often called "beats") is created when two corresponding tones are struck together, owing to the slight difference in frequency. In most modern kebyar gamelan, this difference is about six to ten cycles per second throughout the entire range of four-plus octaves. Paired tuning is responsible for the shimmering or pulsating sound quality of a Balinese gamelan.

The paired tuning system is a perfect acoustic analog for the musical technique of kotekan. In both there exists an inseparable polarity between the two complementary parts; neither can stand alone. (The Balinese consider the sound of a single instrument of a paired set lifeless.) Not surprisingly, the terms used for these systems - *polos/sangsih* for kotekan and *pengumbang/pengisep* for paired tuning are often used interchangeably.[Footnote 5]

The relationship between these two systems in the group of eight gangsa can be seen in figure 2. As the chart indicates, each of the two kotekan parts is played on both a low (pengumbang) and high (pengisep) pemade, and likewise with the kantilan. This result is that the rapid beats created by paired tuning is heard in every musical strand.

Technique

The technique used to play the gangsa is critical in the execution of kotekan parts. The wooden mallet used to strike the keys is held in one hand, leaving the other hand free to damp the key's vibration after it is struck. The motion of the damping hand therefore mirrors that of the playing hand, following it along as its shadow. Aside from the obvious necessity of flexibility in the wrist of the playing hand to assure rhythmic clarity and precision (and to be able to play smoothly during fast tempos), it is important that the damping technique be equally precise. The note must be sharply defined both in its attack - the exact moment in which it is struck and thereby placed rhythmically and in its disappearance as well, where another note or a rest will start. The reason is that the following note will often be in another part of the kotekan, performed by a different group of players. Any note which is allowed to ring too long will "bleed into" the following tone and obscure it a bit, resulting in a muddied sound; conversely any tone dampened too quickly will cause a slight gap or hole in the texture, which will create a disjunct or overly staccato effect.

Melodic Elaboration

In looking at the way kotekan relates to the overall musical structure of a Balinese composition, many questions immediately arise. For example, is there a harmonic system at work, based on some chordal or intervallic scheme? Is kotekan built on a purely rhythmic framework? Is it partly improvised? Or is kotekan itself the actual basis of the music from which the other parts are derived? These possibilities seem obvious enough given the musical predominance of kotekan, standing most often in the foreground of the musical landscape. From a learning perspective as well, it often happens that the beginning student is immediately drawn into this fascinating system of interlocking parts, thinking that they form the real core of a plece.

However, none of these possible descriptions are accurate. Kotekan is, with rare exceptions, a highly detailed elaboration or embellishment of a slower core melody, played by the *calung* and *ugal* in the middle and low octaves. That melody - and not the kotekan - is the primary musical thread. The kotekan is woven through and around this melody, meeting it in unison or octaves at important junctures - the primary downbeats of a phrasc but also frequently taking short excursions away from it, or conversely remaining fixed in one position while the melody moves around the kotekan. The Balinese metaphor for this relationship illustrates the principle quite clearly. They see the kotekan as

the flowers of a tree, where the branches represent the core melodies, and the trunk the more fundamental level of

Figure 2. Kotekan/paired tuning relationship.

punctuating gong and bass tones. This image also reflects the colotomic or multi-layered structure of the music, where the lowest tones move the slowest, and each higher level moves at a progressively faster rate, usually twice the speed of the level below it. The Balinese in fact frequently call kotekan the "flowers" *bunga* of a composition, the finest and most detailed superstructure resting upon an underlying framework. lt simultaneously enhances that melody by highlighting its contours and rhythmic outlines, decorates it with an often surprising array of melodic twists and turns, reflects it in "microcosm" (sometimes the shapes of the *pokok* (core melody) can be found, rhythmically compressed, in its kotekan figuration; see figure 16) and presents an internal structural world of its own, seemingly propelled from within by the logic and momentum of its rhythmic patterning.

Sonically, the difference in timbre between the kotekan and the pokok melody is easy to discern. The two calung, on which the pokok tones are played, are struck with rubber-faced mallets, producing a sustained humming tone (due to the paired tuning) with almost no attack sound. This tone quality, despite its soft and rounded timbre, is nevertheless quite penetrating within the total sound of the gamelan. The gangsa, on the other hand, are struck with hard wooden mallets, creating an extremely bright metallic attack as described above. Although most of the calung range overlaps the low octave of the gangsa class="10"[Footnote 6], the timbral difference between them helps to keep the musical stratification clear.

Structure

In the following discussion of specific techniques used in kotekan, it is important to keep in mind the principle of melodic elaboration outlined above. In order that the relationship of melody to figuration remains clear, they will always be shown together, with the pokok melody notated below the kotekan. The examples are drawn almost exclusively from the repertoire of the gamelan gong kebyar, and were composed or arranged within the last 50 or 60 years.

One of the primary characteristics of kotekan structure is the tendency to fill out all of the smallest units, or subdivisions, of the beat [Footnote 7]. In other words, kotekan figurations usually form continuous and steady streams of notes on the most rapid level of rhythmic division occurring at that moment. Normally this level of subdivision is four or eight times faster than the movement of the pokok melody. In Western notation this could be indicated by a quarter or half-note for the pokok, with the kotekan in sixteenth-notes.

The essence of kotekan, however, is that no one part contains all of these notes. Gangsa kotekan are instead always divided into two parts, which the Balinese call polos and sangsih. Often these terms are defined respectively as the "simple" or on-the-beat part [Footnote 8], and the "differing" or off-the-beat part. While this is generally true, these two parts often have a much more complex relationship, especially in modern compositions. In many cases the polos and sangsih are dovetailed in such a way as to place each part on the beat at different moments, so that their rhythmic roles are constantly shifting.

Perhaps the simplest kind of kotekan structurally - though one of the most difficult to play because it usually appears at the fastest tempos - is one the Balinese call *nyog cag*. [Footnote 9] It is a straightforward alternation, with the polos always falling on the beat and the sangsih off the beat, filling in the spaces to create a continuous figuration. In figure 3, from the *pengipuk* (love scene) section of the dance piece *Teruna Jaya*, the polos part joins the pokok tones at the octave on every other beat. The sangsih part would appear as in figure 4. Together they form a figuration which spans most of the range of the gangsa (figure 5).

The relationship of the figuration to the pokok melody in this example is a good illustration of the principle of melodic elaboration. Joining the pokok at every other tone the four primary downbeats of this eight-beat phrase the overall motion of the kotekan mirrors the rise and fall of the melody. At the same time it fills the spaces in between with a sufficiently varied array of melodic patterns to create an interesting contour of its own.

How do players synchronize at such a tempo? This section is often played at about MM. 140, which requires 280 notes per minute from each part, or about 560 notes per minute for the entire kotekan

figuration. While a good percussionist can easily imagine playing the polos part at that tempo, considering that it falls regularly on the beat, the sangsih part is another matter. The precise execution and synchronization of continuous offbeats at such a tempo would seem to defy the rhythmic skills of any player.

The answer to this lies in our conception of the nature of "down" and "up" beats, and the kind of gestures we are taught to use in making them. Nearly every performer of Western music especially in the classical tradition - is taught to feel the two as fundamentally different musical gestures. The downbeat is said to have more weight, to be a kind of arrival or landing of the rhythmic impetus. It is the letting out of the breath. Conversely an upbeat is the taking in of breath (often audible when a performer plays the first upbeat of a phrase), where an implicit tension is created. The rhythmic swing is upward, creating a kind of potential energy that will only be resolved with the following downbeat.

Played in this way, a sangsih part such as shown above would be truly impossible to perform with any precision. A continuous upward or "off" feeling behind it, with no downbeat in the part for reorientation to the metric framework, would quickly throw the player out of sync. The Balinese sense of "off the beat" and "on the beat" must be qualitatively different in the execution of kotekan parts.

The key to understanding this difference lies in the kotekan itself. In figure 4 the offbeats of the sangsih part are not meant to add any rhythmic tension to the music, rather simply to fill in the gaps in the wave motion of the figuration. In order to do so accurately, the player must concentrate exclusively on the resultant pattern. That is, he must be as aware of the other part as of his own, perceiving the downbeats as if he were producing them himself. The sangsih player is simply placing his notes in between9. This kind of concentration frees the player from applying an upbeat gesture to the sangsih. He plays it exactly as one would play the polos, with undiminished speed and an identical technique. The shift in rhythmic orientation also allows the sangsih player to focus his concentration on the most important factor, that of synchronizing his part to the polos as perfectly as possible. At every moment he is ready to make the slight speed adjustments needed to "lock" his part into place. When all the players in the gangsa section achieve this (which in most well-rehearsed groups they do) the sound of the individual instruments disappears into the complete web of the figuration, and all the players sound as one.

Another of the most common kinds of kotekan patterns is called *nyok cok*. In this type of kotekan, as well as many of the other forms that will be described below, the two parts share certain tones, while the others are played only by one of the polos/sangsih pair. This increases the range of melodic and rhythmic possibilities within each part, and adds a slight accentuation or reinforcement of the tones that are struck in unison by all eight gangsa.

Nyok cok figuration is characterized by a wavering or neighbor-note motion around each pokok tone. Unlike some other kotekan types, nyok cok always follows the pokok melody strictly, anticipating each of its tones before it is struck by the two calung and ugal. Figure 6 is from the instrumental composition *Jaya Semara* (also know in certain regions by the name Kapi Raja). Here the anticipating tones (three sixteenth-notes before the pokok moves, indicated by asterisks) are the ones where the two parts are momentarily in unison. The resulting reinforcement of these tones, just before the downbeat of the pokok, adds a certain rhythmic drive to this type of section (*pengecet*, second movement), further heightened by the extremely fast tempo at which it is often played (MM. 150 or faster).

This form of figuration also occurs in slow tempos, such as the lengthy *pengawak* (first movement) sections of traditional pieces, where the entire figuration is played by all players that is, not divided into separate parts. This kind of melodic elaboration, based on simple alternation between the pokok tone and the adjacent tone above it, probably predated kotekan techniques. Kotekan may well have evolved out of the desire to play this figuration at faster and faster tempos, until a single player could no longer execute all of the notes. In fact this process can sometimes be heard within a single piece, when for example a slow pengawak accelerates into a faster section without switching to a different figuration. The players split the figuration into kotekan at the point where it becomes too fast to play alone, usually done so smoothly that the listener is unaware of the division. [Footnote 10]

Kotekan Telu

Whereas the two kinds of kotekan already described use relatively simple techniques to divide a figuration - either filling in the steps of mostly scale-wise motion (nyog cag) or alternating between a tone and its upper neighbor (nyok cok) - kotekan telu opens the door to a much wider range of combinations, both rhythmic and melodic. Here the technique of sharing tones between the sangsih and polos becomes pivotal, in a very literal sense.

The Balinese word *telu* means three, and the common feature of all kotekan telu figuration is the use of three adjacent tones that function as a unit or cell around the pokok tone. One of the three tones within the cell will always land on the pokok at the unison or octave; as with other kotekan forms, this normally occurs either on every beat or every other beat (always the stronger ones). Although the cell may shift to a different position in the scale in order to follow the pokok melody, the first few examples will deal only with those that remain stationary, so that their inner structure may be revealed.

Within this cell of three tones, the division into sangsih and polos always involves sharing the middle tone, which serves as a kind of pivot-point between the two parts. One of the parts will oscillate between the two higher tones, and the other between the two lower tones. Figure 7 illustrates a common form of kotekan telu, which appears in the last section of the masked-dance piece *Jauk*

In this case the pokok, itself a simple alternation between tones, is met on every beat by the kotekan - on the primary downbeats by the polos part, and on the secondary beats by the sangsih. So while neither part is completely on or off the beat, each has an overall metric orientation in one or the other direction. The pivot tone in this kotekan always falls just before each beat, adding a slight accentuation and syncopation to the overall rhythmic flow.

More important, however, in understanding kotekan structure is the composition of each of the parts on a molecular level. In figure 7 each part is made up of only three elements: a single note, a single rest, or a pair of adjacent tones [Footnote 11], combined in such a way as to yield the resultant figuration. In fact every kotekan is made up almost exclusively of these elements, with the occasional use of a three-note group. One reason for the prevalence of these simple units, clear to any performer of kotekan, is that they yield the most easily playable pattern, which can be combined to form any kind of figuration. For example, four successive tones in one part would become exceedingly difficult to play at a fast tempo (three already taxes the upper tempo limit of most players). Two successive non-adjacent tones would create a difficult leap, and likewise two successive rests would put an awkward pause in the part. Either of these would interrupt the fluid motion of the arm which is so critical in playing kotekan.

From another perspective these elements can be said to constitute the fundamental building blocks of the language of kotekan, just as the binary bits of 0 and 1 (on or off) are the smallest units in a digital computer language. In both cases a small array of building blocks can produce a large vocabulary of possible combinations.

Keeping the same two-note pokok melody, the elements in figure 7 could be rearranged into a slightly different sequence, resulting in a different kotekan telu pattern (figure 8).

The relationship to the pokok remains the same; only the sequence of notes between the beats has changed, shifting as well the metric position of the common pivot tone. Yet the difference in patterning is clearly audible, even at the fastest tempos.

If the pokok melody were somewhat different, alternating between two adjacent tones, a different kotekan telu would be used to elaborate it (figure 9).

Here the polos part makes use of a three-note unit. The polos part now hits the pokok on every beat, while the sangsih joins it on every other beat. Another interesting aspect of this kotekan is that the common tone does not fall in the same position within every beat, as in the previous examples. Instead this pivot tone, with the accentuation gained by being struck by all eight gangsa, forms its own rhythmic pattern as indicated by the arrows. It functions in a sense as a third rhythm "superimposed" on the two patterns of sangsih and polos, except that it arises through the interaction of the two parts rather than the addition of another. The possibility of a third rhythm emerging out of the kotekan is exploited fully in *kotekan empat*, discussed below.

Sometimes the musical context will dictate that the pokok falls on the high tone of the three-note cell. In such cases the kotekan may be an inversion of one in which the pokok is on the low tone;

this can be seen by comparing figures 8 and 10. If the middle tone of the cell may fall on the pokok, a similar rearrangement of these patterns would produce a suitable kotekan (figure 11).

At this point it becomes clear that similar or identical two-beat patterns emerge in different kotekan parts. For example, the polos (lower) part of figure 9 is the same, transposed, as the sangsih (upper) part of figure 11; likewise with the higher and lower parts of figures 9 and 10, respectively. As more complex forms of kotekan are examined, similar patterns will be frequently encountered.

Figure 12, from the dance piece *Gabor*, shows a pokok melody that is four beats in length. Since it spans more than a three-note range, the three-note cell of the kotekan must shift one tone up or down the scale in order to follow it. As can be seen from the contour of the figuration from one beat to the next, the process gives more an impression of "leading" the melody than of "following" it. Each pokok tone is anticipated by the motion of the kotekan. The polos, generated from the current pokok tone and the one that will follow, is combined with the sangsih so that groups of three notes (indicated by brackets) form before each pokok tone and always lead into that tone. The anticipations tend to fall at two points, three sixteenths and six sixteenths before the next pokok tone is struck. [Footnote 12] The placement of the sangsih may be either above or below the polos, depending on the motion of the pokok melody: the sangsih tends to fill in above the polos if the pokok moves downward, and below if it moves upward. In other words, it tends to trail the polos in such a way as to weave the figuration around the melody rather than remaining consistently on one side of it. In this way the internal patterning of the kotekan reflects both the shape and direction of the pokok melody.

Figure 13 shows another example of this particular form of kotekan telu, where the melody is predominantly step-wise motion up the scale. It is from the introductory section of *Teruna Jaya*, in the version used by many groups in south and central Bali. The shift in the kotekan, at the point when the melody changes direction, is more pronounced after the steady climb up the scale.

The frequent appearance of three-note groups in the composite figuration, as seen in figures l2 and 13, is found in many other forms as well, and is a characteristic feature of the rhythmic organization of Balinese music. When extended over several beats this figuration forms a counter-rhythm to the ongoing subdivision of four notes to a beat. Figure 14 shows a simple form of this pattern.

The three against four cross-rhythm functions so that the pattern repeats itself every three beats. (This is also the simplest example of a figuration which is a compressed version of the melody it elaborates, as the brackets on the pokok indicate.) However, most Balinese music is in quadruple meter - that is, it tends to be oriented towards four-beat divisions within a phrase, with the main punctuating gong and jegogan tones falling on every second or fourth beat, or a multiple of four beats. The three against four cross-rhythm shown above is usually arranged to fit into that metric framework. Figure 15 illustrates a typical pattern of this type over a four-beat melody.

Over an eight-beat phrase with a more elaborate pokok melody, the kotekan of figure 16 is often heard. The cycling of the three-note group gives the figuration its rhythmic impetus, as it falls on different parts of the beat with each successive repetition.

A fascinating aspect of this phrase is the pokok melody itself. The melodic pattern it traces is exactly the same as the figuration of the figure 7 - an instance of the way in which identical patterns may appear on different levels in the hierarchy, rhythmically expanded or contracted. In fact, similarities of this kind can be found between even more disparate levels of stratification, such as the *jegogan* (bass) tones and the kotekan pattern. Despite the greater temporal separation between the bass tones, they often articulate the same melodic shapes as the faster moving pokok and figuration patterns above them. Often this becomes apparent only when entire compositions are notated and analyzed. While the technique may seem obvious enough to a composer who has studied Western contrapuntal techniques of augmentation and diminution, it should be kept in mind that the musical language of kotekan has evolved without the use of notation. [Footnote 13] A graphic or visual orientation is not a discernible part of the creative process for Balinese musicians. Perhaps the patterns articulated in interlocking figurations are simply expressions of a more general melodic sense, just as the melodies of a Western classical piece tend to outline the same harmonic progression (I-VI) as the entire composition. In both cases an underlying structural orientation - which for the composer is often more a "feel" for how the music should be put together - reveals itself on many different levels within the music.

Kotekan Empat

With kotekan empat, the possibilities for combining polos and sangsih part into intricate figurations again expand dramatically. Here the cells of the figuration span four tones (*empat*, lit. four), with the polos normally taking the lower two and the sangsih the upper two. There are no shared or pivot tones, as in the case of kotekan telu figuration. Instead, kotekan empat makes use of a kind of harmony, in which the two *outer* tones are always sounded together. Since these two tones are four steps apart in the Balinese scale, the interval formed is in most cases a fifth, as indicated by the brackets in figure 17.

An illustration of how kotekan empat is used can be made with a figuration already encountered above, in figure 16. To rearrange this figuration into kotekan empat (figure 18), the pokok melody and the polos part remain the same, however the sangsih is transformed into a very different pattern through the shift upward. Each time the polos strikes the lower of its two tones it is matched by the higher tone of the sangsih part.

There are several features of this kotekan worth noting, in relation to the kotekan telu version from which it was derived. One is that the lower three tones of the composite figuration - that is, all the notes except the highest tone of the sangsih part - are exactly the same as the original kotekan telu version. This can be seen easily when the two forms are shown together without note stems to differentiate the parts (figure 19).

In a certain sense, then, the composite of this kotekan empat has everything that the telu version has, with the addition of an "extra" tone on top. This resemblance becomes especially evident when the kotekan is played by the entire gangsa section: one can hear the melody of the lower three tones quite plainly, but it sounds as if another overtone or harmonic element has been added to the lowest tone. The overall effect is one of increased complexity and density of the texture as the Balinese musicians often say, "*supaya lebih ramai*": in order to make it more crowded or busy (i.e., ornate).

From another perspective it is the presence of this additional tone which gives kotekan empat its special rhythmic character. The coincidence of the outer tones creates a distinct rhythm of its own that stands out clearly within the texture. This third rhythm has already been encountered in the discussion of pivot tones in kotekan telu. With kotekan empat this rhythmic feature becomes much more apparent. In listening to any kotekan empat, it is relatively easy to adjust one's focus of concentration so that the melodic patterning - the "web" of the kotekan - recedes into the background, while the rhythmic pattern of the outer tones comes to the fore. In figure 19, it is the three against four cross-rhythm which is emphasized. This can be represented visually by placing stems only on these coincident tones (figure 20).

The expansion of a kotekan telu into an empat version can be done with any of the static figurations noted earlier - that is, those in which the three note cells do not shift up and down the scale. The technique is always the same: the pokok and polos part remain unchanged, while the sangsih is shifted upward one tone and rearranged. Figure 21 shows two kotekan expanded in this manner (from figures 7 and 11). The rhythm formed by the outer tones is shown on the top staff.

Again it is clear that the kinds of patterns produced in various individual parts tend to repeat themselves. The patterns of the two new sangsih parts generated above have both been encountered elsewhere. This is another expression of the nature of kotekan as a kind of language all its own, with a repertoire of characteristic formations that can be combined in a multitude of ways, each yielding a distinct composite figuration. In listening to any kotekan, these individual formations tend to meld into the sound of the composite. This is, of course, the goal in performance, where an even balance and unity of articulation, dynamics, and synchronization is constantly sought. However, because of the way in which the parts are combined, especially in kotekan empat, a certain feature of the figuration sometimes comes to the foreground, as with the outer-tone rhythm just described. In a similar fashion, the two *inner* tones, i.e. the upper polos tone and the lower sangsih tone, can be perceived as a pattern or part within the whole. Although there is no single player or group performing this part, it is possible for the listener to experience a momentary perceptive shift, and suddenly the pattern formed by these two inner tones jumps into the foreground.

Although kotekan empat may be produced through a rearrangement of a pre-existing kotekan telu, this is not always the case. Most are composed with the intention of generating an empat version. Usually the pokok melody is composed first, then a polos part which fits well to that melody, and finally the sangsih. As can be seen from the last few examples, the final step of generating the

sangsih is relatively straightforward, for there is a set method for filling in the highest two tones after the polos is already in place.

As a further illustration of this technique, a kotekan empat figuration will be built up successively part by part. The pokok melody from figure 16 will be taken again as the basis for the kotekan, but now with a different polos part above it (figure 22).

Compared to the kotekan telu version, this polos is much more complex, changing its rhythmic configuration with each beat. The individual "bits," however, are still limited to the small repertoire characteristic of all kotekan.

There are two steps involved in producing the sangsih. The first step is to fill in all the spaces - the rests left by the polos part - with the next higher tone in the scale (figure 23).

Next, each of the lowest polos tones is matched by the highest sangsih tone, four notes above, resulting in the complete figuration. [Footnote 14] The outer tones in this kotekan form a highly syncopated pattern, falling on the beat only at the beginning, or primary downbeat, of each repetition (figure 24).

Of course these two final steps could just as well be done in reverse (i.e., the "harmonic" tone first and then the "filling" tone) which is often easier in a typical rehearsal situation where notation is not used. It is again a matter of successively focusing one's concentration on various aspects of the polos, and building up the sangsih part in stages. While this may seem a difficult undertaking without the visual aid that notation supplies, for most musicians in Bali it is a fairly routine task, akin to the skills of a musician in supplying a Western harmonic basis to a given melody. With enough experience a player can supply a complete sangsih part directly without first dissecting the polos in this way. This is due to the fact that both parts of many figuration patterns are already familiar, so that any given polos fragment of one or two beats in length (and sometimes much longer in commonly recurring phrases) can be automatically supplied with the suitable sangsih part. Likewise, for unusual patterns in the polos the composer will often have an intuitive sense of the eventual shape of the sangsih.

Combinations of Forms

For purposes of illustration many of the figuration patterns discussed thus far have been short or fragmentary examples, isolated from longer phrases. While some of these do in fact occur in long repetitive strings (punctuated by occasional *angsel* or breaks to give the phrases a dynamic shape), each of them can be combined with other kinds of kotekan to form a longer and more complex figuration. Often different kotekan forms follow one another in quick succession and are used as building blocks to create extremely elaborate sections within a composition.

A simple example of the combination of kotekan types can be drawn from the instrumental composition *Sekar Ginotan* (figure 25). Here kotekan empat and kotekan telu are combined to embellish an eight-beat melody. It is composed in such a way that the sangsih remains stationary, while the polo shifts up and down one scale degree.

In the famous dance piece *Legong Keraton*, the introductory section (*condong*) contains a passage in which both kotekan telu and nyog cag appear, alternating to produce a balanced wave motion over its 16-beat pokok melody (figure 26).

Even more complex, a phrase from the dance piece *Teruna Jaya* provides a good illustration of the combination of several types of kotekan (figure 27). It occurs at one of the high points of the piece, where there is a sudden pause in the music and then a shift into the highest - and previously unused - register of the gangsa. Three different forms of kotekan are used, as indicated. The kotekan divides itself clearly into two parts, each eight beats in length, with a similar secluence of patterns in each half. One unusual feature of this figuration is that the normal positions of the sangsih and polos parts are interchanged. The polos is in this case the higher of the two parts. Metrically, however, it remains more on the beat than the sangsih, which becomes most obvious during the nyog cag parts of the phrase.

This particular kotekan also demonstrates the freedom that can be taken in elaborating the pokok melody. In this regard it should be noted that the pokok shown above, played by the two calung, differs considerably from the ugal melody. Although the ugal part is normally an only slightly

decorated version of the calung tones (and has therefore been omitted thus far in the discussion), in this instance the ugal plays a much more elaborate melody. Here it may well be called the central melody, of which the calung part distills out only a fraction of the notes. The two parts are different enough to take on separate roles of stratification, adding another melodic layer in the middle of the texture. To show the way in which these layers interrelate, and give a fuller sense of the sound of all the metallophone instruments during this passage, the ugal part is shown along with the very lowest tones played on the two jegogan in figure 28.

As a final example of the extremes of complexity that kotekan can attain, an entire section from a modern composition is offered in figure 29. It was composed by I Wayan Sujana in 1987, and appears in his piece *Genta Anyar*. The varied and unusual forms of interlocking figuration, the use of occasional breaks to set off the phrases in contrast, and the highly syncopated nature of the pokok melody all contribute to the intricate texture and shape of this kotekan. Numerous details in this passage can be seen to differ from the many kinds of figurations that have been described and categorized in this articlc a fact that points, on the one hand, to the necessary differences between the theory and practice of a musical language, and on the other to the continual expansion and experimentation that the Balinese musical tradition reveals to this day.

Footnotes

1 Interlockingparts, sometimes also known by the term *canditan*, are found in many other forms of Balinese music besides the gamelan gong kebyar. However, this article will deal with kotekan only as it is found in kebyar music, and, to a lesser degree, *semar pegulingan* music. While many other ensembles use nearly identical techniques in the construction of interlocking parts, certain ensembles (such as the gamelan gambang) have developed distinct forms of kotekan which vary considerably in structure from the types discussed here.

2 Theuse in this text of the male pronoun "he" is not meant to imply anything about the gender of the player involved. It is used for the sake of textual simplicity only (rather than "he/she," or a contrived grammatical detour to arrive at the impersonal "one" at every juncture.) However, I should note that fifteen years ago it would have been accurate: until that time all Balinese gamelan players were men. To my knowledge, the only musical role for Balinese women was as singers, for example in the dramatic forms of arja, topeng, or gambuh. Since that time the situation has changed dramatically, owing at least in part to the influence of Western musicians involved in the study and performance of Balinese music. Currently there are gamelan groups of female musicians in every district in Bali, who are encouraged by STSI Denpasar and regularly take part in the annual island-wide Art Festival. Until now these groups have been almost exclusively women. However, even this barrier has started to crumble, and within a few years mixed-sex groups will probably be common.

3 Literallythe word gangsa can refer to any or all of the entire family of metallophones in a Balinese gamelan, which include five different kinds of instrument (from lowest to highest): the jegogan, calung or jublag, ugal pemade, and kantilan. Of these, only the last two play kotekan figuration, while the others play various forms of the pokok melody. In common usage, however, gangsa refers especially to the pemade and kantilan, and the word is used in that meaning throughout this article.

4 The pelog scale, found throughout Indonesia and other parts of Southeast Asia, is not "fixed" or standardized, as is the case with the Western equal-tempered scale. While the Western scale has both a standardized reference point and a strictly defined interval structure, the Balinese pelog scale is a more flexible series of intervals without any reference frequency. A general intervallic resemblance is usually enough to identify a scale as pelog, and in practice the scale does in fact vary considerably. An extended discussion of the pelog scale as it is used in Bali can be found in chapter 7 of McPhee, *Music in Bali*.

5 The words used to describe the lower and higher partner instruments or groups in the Balinese paired tuning *system* - *(pe)ngumbang* [lit. "blower"] and *(pe)ngisep* [lit. "sucker"] and those used to describe the upper and lower parts of a kotekan - polos and sangsih - may be used interchangeably. Another variation is *wadon* [lit. "female"] and *lanang* [lit. "male"], which are commonly used to describe the lower and higher kendang, or lower and higher large gongs in those gamelan that contain two (a second large gong is considered optional). The "female" instrument is the lower of the two.

6 The five tones of the calung lie in the second (next-to-lowest) octave of the four-plus octave range of the gamelan, analogous in position to the tenor part in a four-part mixed chorus. Four of those

five tones are identical to the four lowest tones of the pemade.

7 Thistendency towards saturation of the finest units of detail is found in other traditional Balinese art forms as well, such as painting and sculpture. In all these forms, the artistic space is rarely left blank or only in plain outline, but rather is filled with highly ornate detail to the outer boundary limits of the piece. This is expressed in Indonesian by the word *ramai* (crowded or busy), which to the Balinese is a highly desirable condition in almost any realm.

8 cf. Ruby Sue Ornstein, *Gamelan Gong Kebyar: the Development of a Balinese Musical Tradition*, Ph.D. dissertation, UCLA 1971, p. 226.

9 *Ibid*.., p. 227

10 Hardja Susilo's description of Balinese gamelan, offered during the First International Gamelan Festival in Vancouver, B.C. in 1986 expresses this nicely: "In Balinese gamelan half the group plays as fast as they can, and the other half plays as fast as they can, in between."

11 Moreprecisely, a single tone (represented by a sixteenth note) surrounded by rests, a single rest surrounded by notes, or a two-note group surrounded by rests.

12 The anticipation of the pokok tones at one of both of these points - three sixteenths and six sixteenths before the downbeat - is a common occurrence in kotekan figuration, as can be seen in many of the other kotekan examples offered in this article. This reflects a general tendency in the rhythmic organization of Balinese music, which is permeated by various combinations of three and five over an evenly duple meter. In another sense, the use of frequent anticipations is a natural outgrowth of the heterophonic structure of the music, where several melodic strands converge on a single tone at different moments. For example, the improvised melodies of the *terompong* (a row of tuned gongs similar to the reong but played by a single musician) often anticipate important pokok tones at the same two points.

13 There are, in fact, *lontar* or palm-leaf inscriptions on which are notated the pokok and gong tones of certain ceremonial pieces, but these never include any figuration of other melodic elaboration. As with the figured-bass parts of Baroque music, the performers are expected to fill out the details themselves according to their own knowledge (and tastes) within the musical tradition.

14 This particular kotekan is actually found most frequently in the reong part, such as in the male dance piece *Baris*.