

**THE
JAVANESE GAMELAN
KYAI MADU LARAS
(VENERABLE SWEET HARMONY)**

**A gift to the Faculty of Music
from
The Minister of Forestry
of
The Republic of Indonesia
H.E.SUDJARWO**

JEREMY MONTAGU

**THE BATE COLLECTION
OF
HISTORICAL INSTRUMENTS**

**UNIVERSITY OF OXFORD
FACULTY OF MUSIC
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Among the earliest evidence for the Javanese Gamelan are a few instruments found archæologically and carvings on the eighth century AD Temple of Borobudur, which include *bonangs*¹, *sarons* and *gongs*. Some instruments, including the *rebab* and the *tarompet* (a shawm which is displayed in the Shawm Case), were introduced with Islam in about the 14th century, and by the 15th century gamelans existed much as they do today. An increase in the number of instruments has continued, and the inclusion of a full set of *kenongs* and *kempuls* is comparatively recent.

There are many varieties of gamelan in Indonesia today, consisting of different types and combinations of instruments, some with instruments made of bamboo, some with instruments of bronze, others with those of iron, and some with large numbers of instruments, and some with only a few. The Gamelan *Kyai Madu Laras* is the classic type of Central Javanese gamelan and is a full double gamelan of high-quality bronze instruments. It came to us from Klaten, a small town halfway between the two great centres of Central Javanese gamelan, Surakarta (or Solo) and Yogyakarta (or Jogja), as a most generous gift from the Minister of Forestry of the Republic of Indonesia, His Excellency Sudjarwo.

Gamelan music is used for many purposes in Java: for ceremonials in the Sultans' courts; for ritual music; to accompany dance; for the *wayang*, plays often recounting the dramas of the Javanese versions of Hindu mythology, which are acted either by people or by puppets, which may be either three-dimensional or the flat shadow-puppets, some of which are sometimes on display on the end wall behind the gongs; and for general music of all types, from the liveliest to the most solemn. The instruments are used in various combinations, according to the type of music, but in the two major divisions, between loud and soft styles, the *sarons* and the *bonangs* will predominate in the loud style, and the *genders* and the *gambang*, with the *rebab*, *suling* and singers, in the soft style.

The instruments can be divided into four groups:

A) those which play the nuclear melody or *balungan*, the larger *sarons* and the *slentem*;

B) those which play counter-melodies or which may paraphrase and/or decorate the *balungan*, the *rebab*, the *suling*, the smallest *saron*, the *genders*, the *bonangs*, the *gambang*, the *siter*, and the singers;

C) those which provide and control the rhythm and the tempo, the *kenangs* and occasionally the *bedug*; and

D) those which punctuate the melodic phrases, often called the colotomic instruments, the *ketuk*, the *kempyang*, the *kenongs* and the *kempuls*, and above all the two great gongs, the *gong suwukan* and the *gong ageng*.

There are two scale systems in Java, both of them pentatonic, but their intervals are very different in size and their notes very different in pitch, and therefore most of the instruments have to be duplicated. One of each type and size is built in *slendro*, which has five pitches whose intervals are not far from equal, ranging in this Gamelan from 213 to 270 cents² (exact equidistance would be 240 cents, just under one-and-a-quarter tones in our equal-tempered scale). The other scale is *pelog* which has seven widely differing pitches from which five are chosen for any one musical scale. The intervals between the seven pitches in this Gamelan vary from 88 cents (slightly smaller than our semitone) to 295 cents (just under our minor third), but because of the notes omitted in choosing a five-note scale, the wider intervals of *pelog* can vary from a major third to just under a fourth. Again, one of each type and size of instrument must be available for *pelog*, and because they usually have either note 1 or note 7 (*panunggul* or *barung*), there are two *genders* of each size and two *gambang*s tuned to *pelog*.

The one pitch which is more or less common to both *slendro* and *pelog* in this gamelan, as in most gamelans, is *nem* (pitch 6), which averages ${}_21039$ ellis², just under a quarter-tone above the European B \flat . The tuning system is further complicated because traditionally no two gamelans were tuned the same. Today the Javanese Radio's gamelan tends to be taken as a standard and most modern gamelans are tuned as that is. Our gamelan dates from the early years of this century, before radio was heard of, and our *slendro* is unusual in that the smallest steps are between *dada* and *lima* and between *lima* and *nem*, notes 3, 5 and 6, as may be seen in the tables of tunings on pp. 7-10. In all gamelans, whether old or new, no two instruments, and indeed no two octaves on any one instrument within any gamelan, are tuned the same. This is very carefully done so that when octaves are played together, the sound will waver and throb and thus add charm and character to the music. In addition, the vocal scales, and those of the *suling* and the *rebab*, are more complex still, and their pitches may vary quite considerably from those of the fixed-pitch instruments of bronze and of wood which accompany them. The result is not, to the ears of the Javanese and of all who value this music, a chaotic cacophony, but a blend of pitches of great beauty.

The Gamelan *Kyai Madu Laras*, made in the early years of this century, is said, by those who are experienced in gamelan music and familiar with the other Ja-

vanese gamelans in this country, in Cambridge, Durham, York, on the South Bank, and at the Indonesian Embassy in London, to be the finest gamelan in playing condition now in Britain. This is partly because of the weight of metal in the instruments, which leads to a better tone quality, partly because it is in the Solo tradition, which aims for a rather richer, if less bright, tone quality than the Jogya tradition (which can be heard on the South Bank), and partly because this is the oldest playable gamelan in the country, and a gamelan takes thirty or more years to ripen, just as many instruments do in our culture. It was retuned in the summer of 1987, something that has to be done every two or three decades, and this has noticeably improved its resonances. It is in constant use, being played weekly with concerts once or twice a year, and the Faculty of Music is most grateful for so munificent a gift.

THE INSTRUMENTS

Group A:

The *Sarons* have slightly curved, heavy bars of bronze, resting over a trough resonator carved from a massive wooden body. There are three sizes of *saron*, each an octave higher than the other. The *demung* is the largest and the lowest in pitch, the *saron barung* is the medium instrument, and the *saron panerus* or *peking* is the smallest, with very thick bronze bars, and the highest in pitch. The range of each *saron* is one octave in *pelog* and an octave and one note in *slendro*; a larger instrument, the *saron wayang*, with a range of an octave and a half, is used to accompany *wayang* plays in *slendro*. The two larger sizes, the *saron demung* and the *saron barung*, usually play the *balungan*, the nuclear melody. The player uses one beater, a wooden mallet, stopping the sound of each note with the other hand at the moment that the next note is played so as to avoid a build-up of clashing pitches (because striking the instruments inexpertly can damage them, we do not display the *tabuh*, the beaters, with the instruments). This practice, of stopping one note while playing the next, is an essential part of the technique with most of the instruments of the gamelan, and it is one that many beginners find difficult to master.

The *Slentem* and the *Genders* have thin bronze plates hanging over tubular resonators.

The resonators in earlier periods were made of bamboo, as they still often are in Bali, but nowadays they are usually made of metal as on this gamelan. They are tuned close to the same pitches as those of the plates above them so that the air inside the tubes will add a hum to the sound and will help it to sustain. Unlike the bars of the *saron*, which rest on small cushions on the wooden base and are held in position by iron pins, the plates of the *genders* hang freely on cords from pegs standing in holes on the elaborately carved wooden base. The *genders* are also made in three sizes. The lowest, the *slentem*, which is illustrated here, has a range of one octave and plays the *balungan*. Like the *sarons*, the *slentem* is played with one hand and silenced with the other. The two other sizes, the *gender barung* and the *gender panerus*, and their playing technique are described below in Group B.

Group B:

The *Rebab* is a spike-fiddle, with two strings tuned a Javanese fifth apart, about 650 cents. The strings are of brass, tensioned with very long tuning pegs, and they rest on an unusually wide-footed teak-wood bridge placed high on the thin belly, which is made of buffalo intestine. When not in use, the *rebab* rests on an elaborately carved stand.

We were fortunate enough to acquire a second *rebab*, which can be borrowed by members of the Oxford Gamelan Society for practice, and which has retained the top spire of the neck, a feature which is missing from the original instrument. The *rebab* plays either a fully decorated version of the melody or a counter-melody which, to Western listeners unaccustomed to the subtleties of the gamelan, may sound quite unrelated to whatever else is going on, but it always fits perfectly with the rest of the gamelan. The bow, the hair of which is loose and without any mechanical method of tension, is held underhand so that the tension of the hair is controlled by the fingers and thus can be varied. The strings are not pressed to the neck, as they are with European bowed instruments, but are stopped by the fingers in mid-air, as it were. The *rebab* is occasionally played by the leader of the gamelan, but more often, even though the *rebab* is the leading melodic instrument, the director will play the *kenang*, which controls the rest of the gamelan.

Solo and chorus singers have an essential part in much of the gamelan repertoire. As with the *rebab*, the solo singer or *pesinden* has great freedom to elaborate the melody with florid decoration. Both the *rebab* player and the *pesinden* use many intervals foreign to, but compatible with, the notes of the fixed-pitch instruments.

The *Bonangs* are sets of gong kettles resting loosely on cords on a frame. They are important paraphrasing instruments, often anticipating the direction in which the nuclear theme is progressing (a great help to the *balungan* players who are thus cued for their next note or phrase), and decorating and syncopating the melody in rapid notes, often 3, 4, 6, or 8 notes to each one of the nuclear melody. The higher *bonang panerus* normally interlocks its figuration with that of the *bonang barung*. The *pelog bonangs* each have a range of two octaves, the upper octave of the *bonang barung* being the same as the lower octave of the *bonang panerus*; the *slendro bonangs* each have a range of two octaves and two notes and similarly have one octave common to both sizes. The *bonangs* are often played in octaves, with a beater in each hand, and the arrangement of the kettles makes this easy, with each note and its octave diagonally apart.

The smallest *saron*, the *saron panerus* or *peking*, also decorates the melody, sometimes playing two notes to each one of the larger *sarons*, but often with a much more complex and elaborate part.

The *gender barung* and the *gender panerus* are smaller than, but similar to, the *slentem* already described, but they have a larger range. Each covers a range of two-and-a-half octaves, their compass interlocking like that of the *bonangs*. There are two of each size in the *pelog* set of instruments, one having notes 2 to 7, and the other having notes 1 to 6, both without note 4. The *gender* is played with a beater in each hand necessitating a very elaborate technique of silencing the bars with the thumb and the heel of the hand, which requires very supple wrists and much practice; they play florid decorative parts in the quiet gamelan.

The *Gambang kayu* is the xylophone, with wooden bars resting over a trough resonator.

As with the *genders*, there are two *gambangs* for *pelog* and one for *slendro*. Rapid figuration and decoration, played in octaves with two beaters, which have long flexible handles of horn, is the normal technique, and because the sound of a wooden bar is much shorter in duration than one of bronze, no damping or silencing is required.

The *Suling* is an external-duct flute, with the duct formed by a ring of leaf or a thin strip of bamboo tied round the head of the flute so that the air may pass between the ring and the body of the instrument to the lip of the mouth. The *pelog suling* usually has five finger holes, and with them all covered sounds *panunggul* (note 1) and with them all open sounds *barung* (note 7); again note 4 is omitted. The

slendro suling has four finger holes, all closed sounding *gulu* (note 2) and all open sounding *panunggul*. In addition to the basic notes of each scale, produced by opening the holes in turn, the normal flute techniques used all over the world of cross-fingering, half-holing, etc, allow players to vary the pitch, so that ornaments and decorations will, as with the voices and the *rebab*, include variations of pitch as well as of melody.

Group C:

The *Kenangs* are the principal rhythm instruments, and are normally played by the director of the gamelan, who will use them to control the other players and to signal all changes of speed or of melody and to indicate the move from one section of the piece being played to another. There are three sizes: the large *kenang gending* and the small *kenang ketipung* are used together in many styles of music; the medium *kenang ciblon* is mainly used for dance music and the *wayang*. As in most high-art drumming, the player uses his fingers rather than sticks, and thus has full control over variation of pitch and of tone quality.

The *Bedug* is a much larger drum, and instead of being tuned with thongs and braces like the *kenangs* (and like the European military drum), it has two fixed heads which are nailed in position with large pegs. Its internal construction is simple and follows the outer shape of the shell. This again is in contrast with the *kenangs*, which are very elaborately shaped inside, shaping which controls their sound, resonance, and tone quality. The *bedug* is only occasionally used, mainly for ceremonial music, especially the louder types. It is played with a heavy wooden beater.

Group D:

The *Kenongs* are large gong kettles resting on crossed cords in a frame which holds either two or three kettles. They are among the punctuating, or colotomic, instruments. Originally there were only one or two *kenongs* for each of the two scale systems. Nowadays there is usually one for each pitch, and in some musical styles they play some of the notes of the melody in alternation with the *kempuls*. In other styles their rôle is more structural, marking the sections between the gong strokes. Like all the gong kettles and hanging gongs, they are struck on the

protruding boss with a single beater.

The *Kempyang* and the *Ketuk* are two small kettles sitting in a frame. There is one pair for *pelog* and another for *slendro*. They punctuate the music, the *kempyang* with a high-pitched sound, and the *ketuk* with a very dead sound, as the names suggest. The dead sound of the *ketuk* is achieved partly in the forging of the kettle, and partly by the player always leaving the beater in contact with the boss for a brief moment after striking it. The two instruments are played by the same player, who often plays the *kenongs* also, using a beater in one hand for the *kenongs* and one in the other for *kempyang* and *ketuk*.

The *Kempuls* are the smaller gongs hanging from the two gong stands at the back of the gamelan. Like the *kenongs*, they have multiplied in recent years. They also punctuate the melody, usually in alternation with the *kenongs*. They are usually played by the same player as the two large gongs.

The *Gong Suwukan* and the *Gong Ageng* are the only instruments which should be called gong in the gamelan. The *gong suwukan* is the smaller of the two and the higher in pitch, and hangs at the right-hand end (with one's back to the wall) of the front gong stand. The great *Gong Ageng*, which hangs at the opposite end of the same stand, plays at the end of each sentence of the music and is the most important instrument in the gamelan; in Java offerings would be made to it weekly. It is forged with great care and skill, and not only is its pitch carefully tuned, in this gamelan to 28 Hz, just above the A two octaves below the bass stave, but its *ombak*, its rate of pulsation, is also carefully established, in our case to approximately 76 beats to the minute. It is the only instrument in the gamelan which is not filed and scraped and then highly polished.

None of the instruments is cast. All are forged from flat discs of bronze. Today there are few good gong-smiths surviving, and the craft all-but died out in the second quarter of this century. It was the upsurge of interest in gamelan music in the West, particularly in America, which led to the revival of the necessary skills, and gamelan-making is now once again a thriving craft in Java.³

Notes

¹The Javanese plural doubles the singular (e.g. *saron saron*). For simplicity,

the English plural of a terminal s is used here.

²The ellis (El) was introduced by Robert Stuckey at the 1985 Ellis Centenary Conference in Belfast, as a non-, or at least minimally, Eurocentric method of expressing pitch in an easily recognised form. It uses cents (invented by Ellis in 1885 as hundredths of an equal-tempered semitone, with 1200 cents in an octave, 700 in an equal-tempered fifth, and 702 in a pure fifth), to express pitches within the octave, with a preceding subscript figure to indicate the number of octaves above the 32-foot C at 16.4 Hz, which is used as a base pitch. Our tuning A (440 Hz) would be expressed as ₄900 El. The pitches of this gamelan, which were determined with a Korg electronic tuner, are given on pages 7-10 in ellis, which makes it very easy to compare the pitches of one instrument with another and to distinguish the *slendro* pitches from the *pelog*.

³Alec Roth, who was the first regular tutor of the Oxford Gamelan, has, as always, been most helpful in the compilation of this Handbook, as has Tim Byard-Jones, who has taught the Gamelan in the vacations and when Alec Roth was otherwise engaged.

THE MUSIC

It is a characteristic of traditional Javanese music that beats are counted in groups of four (some recent music is in three and other time-groups) and that the most important beat is the fourth (not the first as in Western music). With one exception, the fourth beat is always marked by a stroke on the gong or one of the other colotomic (time-keeping) instruments; the exception is the first group of four, in some forms, because the gong stroke on the fourth beat of the fourth or last group is strong enough to carry over through the next group, which may be the first group when the music is repeated, as it frequently is.

Two of the simpler examples of Javanese musical forms are *Lancaran* and *Ladrang*. In the former, the *balungan* or nuclear melody is played on the second and fourth beats of each group of four. The notation is numerical (see the Tuning charts on pp. 7-10 for the names and numbers of the notes). The beats on which notes of the *balungan* are not played are indicated by a ●; strokes on the *kempul* by a v above the relevant *balungan* note, which may have a number beside it when the *kempul* plays a note different from that of the *balungan*; strokes on

the *kenong* are indicated by a \cap , again above the *balungan* note, and again sometimes with a number for a different note; strokes on the *ketuk* are indicated by a + (these + are normally omitted; players are expected to know when to play); strokes on the gong are indicated by enclosing the relevant note of the *balungan* within (). ■ : and : ■ indicate a repeat. All pieces in these forms commence with a short melodic introduction, the *buka*, ending with the first gong stroke, which is also the first note of the *balungan*.

LANCARAN SINGA NEBAH (*pelog barang*)

\cap

buka: ● 5 3 2 ● 5 3 2 ● 6 5 (3)

■ : + + + v + \cap + v + \cap + v + \cap

● 5 ● 3 ● 5 ● 3 ● 5 ● 3 ● 6 ● (7)

+ + \cap + v + \cap + v + \cap + v6 + \cap

● 6 ● 7 ● 6 ● 7 ● 6 ● 7 ● 3 ● (2)

+ + \cap + v6 + \cap + v6 + \cap + v + \cap

● 3 ● 2 ● 3 ● 2 ● 3 ● 2 ● 5 ● (3) :■

In Ladrang form, the various indications are the same, save that the *ketuk* and the *kempyang* play a different pattern, the *kempyang* on the first and third beats of each four and the *ketuk* on the second; as is customary in gamelan notation, these are not indicated here, to avoid excessive complexity of notation. In Ladrang, the first section is usually followed by a *ngelik*, a section with a vocal part, which would be too complex to give here.

A cassette is available from the Bate Collection (price £4.60), which includes a performance of Ladrang Wilujeng played on this Gamelan by the Oxford Gamelan Society in the Holywell Music Room in 1987.

LADRANG WILUJENG (slendro manyura)

buka: ● 1 3 2 6 1 2 3 1 1 3 2 ● 1 2 (6) \cap

■ : 2 1 2 3 2 1 2 6 3 3 ● ● 6 5 3 2 $\cap 3$ $\vee 6$ \cap

5 6 5 3 2 1 2 6 2 1 2 3 2 1 2 (6) :■ $\vee 6$ \cap

ngelik: ● ● 6 ● 1 5 1 6 3 5 6 1 6 5 3 2 \cap \vee $\cap 6$

6 6 ● ● 1 5 1 6 1 1 3 2 ● 1 2 (6) $\vee 6$ $\cap 1$ $\vee 6$ \cap

(from ■ : with the repeat)

THE TUNINGS

SLENDRO

as the Gamelan was when it was presented to us, 17th May 1985

	Panunggul 1	Gulu 2	Dada 3	Lima 5	Nem 6
Kempul	₃ 85	340	₂ 598	803	1035
Slentem	₃ 63 ₄ 85	322	590	₂ 1072 803	1043
Gender	₃ 78	332	598	815	₂ 1050 1042
Barung	₄ 90 ₅ 86	332 347	588 587	812	1030
Gender	₄ 85	335	590	813	₃ 1035 1038
Panerus	₅ 88 ₆ 90	345 355	586 603	808	1045
Saron Demung	₄ 74 ₅ 87	341	588	804	₃ 1050 1032
Saron Wayang	₅ 85 ₆ 93	347 355	588 600	805	₄ 1030 1035
Saron Barung	₅ 88 ₆ 95	342	586	808	₄ 1027 1043

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	Panunggul 1	Gulu 2	Dada 3	Lima 5	Nem 6
Saron					⁵ 1034
Panerus (Peking)	₆ 92 ₇ 120	355	602	820	1080
Kenong	₅ 89	⁴ 337 340	585	798	1038
Bonang Barung	⁴ 100 ₅ 93 ₆ 97	348 344 365	582 590	812 805	1040 1038
Bonang Panerus	₅ 92 ₆ 97 ₇ ?	347 360 ?	594 600	805 823	1045 ?
Gong Ageng					₁ 908

It is interesting to note that, just as our piano tuners do, the Javanese stretch the octaves in the upper part of the register; octaves 6 and 7 are consistently sharper than those in the middle register. Unfortunately, the three highest notes on both the *bonang panerus* would not register on the tuner, and nor would any of the three *gambang kayu* (their notes are all too short in duration for such machinery to function), or this tendency might have been even more obvious.

SLENDRO

after the Gamelan had been tuned by Pak Panggiyo & Pak Al.Sutikno, July 1987

	Panunggul 1	Gulu 2	Dada 3	Lima 5	Nem 6
Kempul	² 70(?) ₃ 88	338	² 585(?)	805	1047
Slentem	₃ 68 ₄ 85	328	595	810	² 1048 1035
Gender Barung	₃ 75 ₄ 85 ₅ 82	330 337 347	595 584 583	810 807	² 1050 1035 1025
Gender Panerus	₄ 85 ₅ 85 ₆ 90	337 345 355	585 586 600	813 805	³ 1032 1030 1042
Saron Demung	485 ₅ 87	337	585	808	³ 1035 1027
Saron Wayang	₅ 84 ₆ 90	345 350	584 600	806	⁴ 1030 1032
Saron Barung	⁴ 1028 ₅ 85 ₆ 92	348	585	808	1046
Saron Panerus (Peking)	₆ 88 ₇ 118	350	600	820	⁵ 1045 1080

The Javanese Gamelan Kyai Madu Laras

	Panunggul 1	Gulu 2	Dada 3	Lima 5	Nem 6
Kenong	₅ 90	⁴ 342 348	590	803	1030
Bonang Barung	⁴ 85 ₅ 90 ₆ 90	338 345 355	580 585	800 810	1020 1045
Bonang Panerus	⁵ 80 ₆ 82 ₇ ?	342 365 ?	585 595	805 820	1045 ?
Gong Suwukan		₂ 300			
Gong Ageng					₁ 910
		<i>Ombak</i> :approximately mm. 76			
Kempyang	88				

PELOG

as the Gamelan was when it was presented to us, 17th May 1985

	Panunggul Gulu		Dada	Pelog	Lima	Nem	Barung
	1	2	3	4	5	6	7
Kempul	₃ 258				₂ 915	1057	₃ 65
Slentem	₃ 250	398	520	795	888	1038	₄ 38
Gender						₂ 1023	---
Barung	₃ 264	397	538	---	892	1038	---
(minus 7)	₄ 260	390	525	---	912	1035	---
	₅ 267	392	532				
Gender						₂ 1052	₃ 5
Barung	₃ ---	392	510	---	890	1040	₄ 38
(minus 1)	₄ ---	388	540(?)	---	910	1032	₅ 50
	₅ ---	392	538				
Gender						₃ 1035	
Panerus						---	
(minus 7)	₄ 252	388	528	---	910	1032	---
	₅ 288	396	545	---	933	1045	---
	₆ 315	415	573				
Gender						₃ 1048	₄ 48
Panerus	₄ ---	392	533	---	910	1032	₅ 42
(minus 1)	₅ ---	393	538	---	935	1048	₆ 55
	₆ ---	412	573				
S.Demung	₄ 255	384	523	773	910	1035	₅ 54
S.Barung	₅ 272	406	538	804	935	1042	₆ 55
S.Barung	₅ 272	393	538	802	937	1043	₆ 52
S.Panerus	₆ 315	413	573	822	982	1088	₇ 75

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	Panunggul Gulu		Dada	Pelog	Lima	Nem	Barung
	1	2	3	4	5	6	7
Kenong	5264	4393	522	---	908	1037	543
Bonang	4257	393	525	782	888	1023	545
Barung	5282	392	535	800	932	1040	652
Bonang	5282	392	525	803	934	1048	655
Panerus	6322	416	578	875	?	?	?

PELOG

after the Gamelan had been tuned by Pak Panggiyo & Pak Al.Sutikno, July 1987

	Panunggul Gulu		Dada	Pelog	Lima	Nem	Barung
	1	2	3	4	5	6	7
Kempul	3255				2915	1032	330
Slentem	3257	385	525	820	908	1035	426
Gender	21043						
Barung (minus 7)	---						
	3262	386	524	---	908	1033	---
	4253	388	520	---	908	1030	---
	5265	388	534				
Gender						21050	35
Barung (minus 1)	3---	390	528	---	907	1038	422
	4---	385	520	---	905	1035	530
	5---	388	533				
Gender						31035	---
Panerus (minus 7)	4250	388	525	---	907	1030	---
	5265	390	535	---	930	1045	---
	6312	415	573				
Gender						31035	425
Panerus (minus 1)	4---	390	524	---	909	1028	530
	5---	390	535	---	935	1045	655
	6---	410	570				
S.Demung	4255	390	520	810	905	1030	532
S.Barung	5268	388	535	806	935	1047	645
S.Barung	5267	392	535	810	933	1047	646
S.Panerus	6312	412	570	815	978	1083	775

The Javanese Gamelan Kyai Madu Laras

	Panunggul Gulu		Dada	Pelog	Lima	Nem	Barung
	1	2	3	4	5	6	7
Kenong	5265	4388	522	---	908	1028	532
Bonang	4257	387	520	815	912	1028	540
Barung	5265	385	532	805	933	1040	655
Bonang	5272	390	532	807	937	1047	655
Panerus	6312	416	573	825	980	?	?
Kempyang						1045 & 1050	

For further information, see:

The New Grove Dictionary of Music & Musicians (under Indonesia).

The New Grove Dictionary of Musical Instruments (under Gamelan and under the name of each of the instruments)

Jaap Kunst, *Music in Java* (this is still the standard text)

-----, *Hindu-Javanese Musical Instruments*

Jennifer Lindsay, *Javanese Gamelan*

The Gamelan Kyai Madu Laras is played regularly and new recruits are always welcome; this is by far the most effective way of learning more about the gamelan and about Javanese music. Anybody who is interested in joining the Oxford Gamelan Society should speak to the Curator of the Bate Collection; membership is not restricted to the University, but is open to all.

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