Gamelan

The Traditional Sounds of Indonesia

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Chapter 1

Music and Southeast Asian History

Although this book's main focus is *gamelan* (bronze percussion orchestra) music in Indonesia, it is important to establish at the outset that neither the modern nation of Indonesia nor gamelan music developed in a vacuum. Indonesia is a conglomeration of islands, peoples, and cultures; its modern form is the result of a history that involves not only the lands and peoples within Indonesia, but the surrounding areas as well. Ensembles called gamelan are most often associated with the Indonesian islands of Java and Bali, but similar ensembles characterize the musical traditions of the entire region. This first chapter will explore the history of the whole of Southeast Asia to isolate a few musical processes—general ideas about how people organize musical activities—that underlie a great deal of music-making throughout the area, by investigating a selected sample of Southeast Asian musical traditions.

Southeast Asia

Southeast Asia's position on a typical map of the world (see Figure 1.1) is deceiving: down in the lower right corner, it seems to be one of the most remote and marginal places on earth. From this satellite's-eye view, Southeast Asia appears as a misshapen peninsula trailing a chaotic mess of ungainly islands, sandwiched between the more geographically impressive landmasses of China (to the north), Australia (to the south), and India (to the West). Conventional maps of the world arbitrarily place Europe or North America at the center; this Eurocentric vantage makes it easy to dismiss Southeast Asia as an out-of-the-way, insignificant place.

Figure 1.1. Map of the world (Southesast Asia circled)

English-language histories, too, tend to be Eurocentric. They concentrate on the rise of civilization in Europe and the spread of European ideas throughout the world while ignoring the achievements of comparable civilizations in Asia, Africa, and the Americas. Such histories generally ignore the cultural accomplishments of Southeast Asian societies, which include the development of many neolithic technologies that contributed to cultural developments throughout the world. Southeast Asia's role in worldwide trading networks before the modern era, too, had far-reaching historical effects rarely acknowledged in modern histories (Lockard 1995:7–8). In modern times Southeast Asia has been ground zero for conflicts of world-dominating ideologies such as colonialism v. self-determination, capitalism v. communism, and minority rights v. nationalism. The integration of Southeast Asia into the world economy remains an issue of great global concern. That seemingly far-off region has long been, and likely will continue to be, a significant historical, political, and cultural force in the world.

Modern national boundaries in Southeast Asia reflect recent geopolitical realities more than long-standing cultural politics. Most Southeast Asian countries are ethnically heterogeneous; borders are often accidents of history and don't coincide with cultural spheres of influence. Virtually all Southeast Asian nations include a variety of cultural, ethnic, and language groups. Some significant ethnic groups, such as the Hmong in Laos and Thailand, have no nation to call their own. Countries in mainland Southeast Asia include Myanmar (formerly known as Burma), Laos, Cambodia, Thailand, and Vietnam. Southeast Asian island nations include Indonesia, the island city-state of Singapore, the tiny sultanate of Brunei, and the Philippines. Malaysia includes territory on the mainland as well as on the island of Borneo.

Significant geographic obstacles effectively separate Southeast Asia from the rest of the world—expansive, deep oceans (the 6-1/2-mile-deep Marianas trench off the coast of the Philippines is the deepest point in the ocean) mark the south and east boundaries, while some of the highest mountains in the world (the Himalayas) fence off the north and west. The land areas bounded by these natural limits share a hot, wet climate as well as an abundance of water and (once upon a time) thick rain forests. The major islands of Southeast Asia are separated only by shallow seas; as recently as 10,000 years ago, during the ice ages, when much of the world's water was bound up in glaciers, some of the larger islands were joined to mainland Southeast Asia by

land bridges; the result of this geographical past is a relatively uniform flora and fauna in the region (Cribb 2000:7–8).

In contrast, the peoples and cultures of modern Southeast Asia exhibit a staggering variety of languages and customs. The prehistory of the region is rife with waves of settlers from elsewhere, who brought with them markedly different physiognomies and language families. Sometimes the newcomers pushed the previous inhabitants into remote regions, but often they settled on top of existing cultures like sediments in a riverbed. Over the past few thousand years, influential religious missionaries and trade emissaries from India, China, and the Arab world came, followed by European colonial powers. Communities in various places adopted or developed sophisticated agricultural techniques and technologies. Great empires, whose rulers and subjects adhered to major world religions such as Hinduism, Buddhism, and Islam, rose, conquered others, and fell, all the while adopting, adapting, and rejecting languages, ideas, and religions; all along, isolated communities cultivated their own idiosyncratic dialects and animistic religions. This great variety begs the question of whether it is sensible to speak of Southeast Asia as some kind of unit in human terms, despite its geographic unity.

The answer is yes, for two reasons. The first is precisely the common environment: Beset by similar environmental challenges, with access to similar resources, it is not surprising that different communities might adopt similar solutions to similar problems. The common exploitation of bamboo as a raw material and the ubiquitous cultivation of rice as a staple food are examples. The second reason is mutual contact among various Southeast Asian peoples and cultures. Different parts of Southeast Asia may be relatively remote to the rest of the world, but they are quite accessible to one another, especially those areas around rivers or bordering the shallow and easily navigable seas. Ideas, innovations, and inventions spread over the region through trade and maritime contact.

Historian Anthony Reid identifies several general social and cultural traits shared by many Southeast Asian cultures which are not characteristic of China and India: "the concept of spirit or 'soul-stuff' animating living things; the prominence of women in descent, ritual matters, marketing, and agriculture; and the importance of debt as a determinant of social obligation" (Reid 1988:6). Reid also isolates a few more specific practices and technologies shared by many Southeast Asian

cultures, including the use of a delicate finger knife to harvest rice, the popularity of cockfighting as a sporting pastime, and music played on bronze gongs (Reid 1988:6).

This book focuses on bronze gong music, especially on gong music from the Southeast Asian island of Java (one of the many islands that comprise the modern nation-state of Indonesia). The various music cultures of Southeast Asia (including those of Java) incorporate an astonishing variety of ensembles that feature bronze gongs, each one sounding quite different from the others. Nevertheless, they all share some fundamental characteristics. Examining the different musical "surfaces" that emerge when various cultures adopt and develop these shared fundamental music-making principles provides an entry point to an understanding of the general traits of Southeast Asian cultures as well as the historical, political, environmental, and social differences among them. To understand the principles of Southeast Asian music-making is to understand the peoples and cultures of Southeast Asia a bit better.

Ecology, Culture, and Music

Southeast Asia's environment has had great impact on its residents' economies and ways of life. Ecology has also exerted an enormous direct impact on the region's musical traditions. For example, many varieties of bamboo grow throughout the region, and Southeast Asian cultures have long exploited its unique qualities for many purposes, including making music. Bamboo is already hollow, simplifying the process of making wind instruments, such as flutes, from it. It is quite easy to work with; using simple cutting tools, it is simple to make a *jaw harp* (see Figure 1.2) by cutting a tongue out of a strip of bamboo, or even a simple string instrument by slitting "strings" from the bamboo's skin and inserting sticks as "bridges" to tighten the strings. Musicologists generically call this kind of instrument an *idiochord tube zither* (see Figure 1.3). Bamboo's naturally sonorous qualities also make it an ideal material for a variety of percussion instruments.

Wood is more difficult to manipulate than bamboo, but also provides the raw material for several kinds of musical instruments. Like bamboo, wood is naturally sonorous. A common Southeast Asian musical instrument consists of a series of tuned bamboo tubes or wooden

Figure 1.2. Kubing (jaw harp) from the Philippines (Henry Spiller)

slabs; the generic musicological term for this kind of instrument is *xylophone*. Some scholars have suggested that the xylophone was a Southeast Asian invention (Miller and Williams 1998:57).

Organic materials such as wood and bamboo deteriorate quickly in the hot, wet climate of Southeast Asia. Instruments made of readily available materials and requiring little investment of time to make, such as xylophones, jaw harps, and idiochord zithers, are well-suited to this environment because they are easy to replace when they disintegrate. Such instruments have been important components of Southeast Asian music cultures for probably thousands of years, and continue to be prominent in modern times.

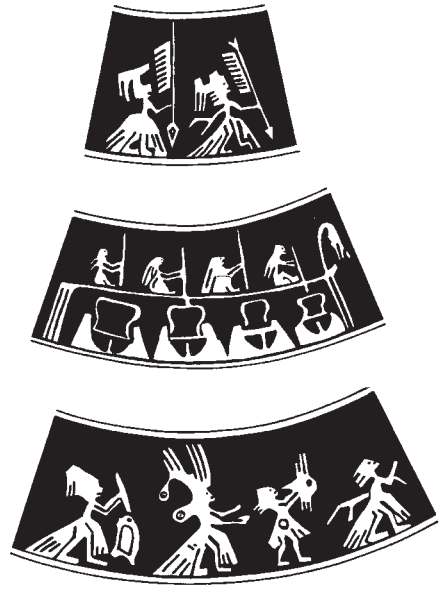
Unlike wood and bamboo, bronze holds up quite well in the moist, steamy environment of Southeast Asia. In contrast to natural materials, bronze requires sophisticated technology and expensive raw materials to make and work, but once forged and shaped it is very durable. It is not entirely clear whether the idea for bronze smelting was independently invented in mainland Southeast Asia or imported from the north in China, but ever since a distinctly Southeast Asian bronze tradition developed approximately 3,000 years or so ago (Higham 1996:338), the metal has been regarded to have magical properties. Perhaps its durability contributed to bronze's perceived mystical power and great value. Among the implements early Southeast Asian bronzesmiths cre-

Figure 1.3. Kalinga musician from the Philippines playing the idiochord tube zither called kolibit (courtesy Robert Garfias)

ated were so-called bronze drums, which were undoubtedly sound-producing devices. Later, bronze became the raw material for a variety of percussion instruments, including gongs, gong chimes (a series of tuned gongs), and metallophones (a series of tuned metal bars).

The contrast between bamboo and bronze begins to illustrate a principle that will assume great significance in the following discussion of Southeast Asian music cultures: the principle of *layering*. Bamboo and bronze belong to distinct layers of material technology that reflect different layers of cultural influence as well. Bamboo represents the technology of the earliest inhabitants of Southeast Asia; direct descendents of these aboriginal peoples have been pushed into marginal areas of Southeast Asia and often maintain traditions different from those of subsequent invaders (Matusky 1998:594). Bamboo also represents the technology of the first proto-Malays who migrated southward from Taiwan into island Southeast Asia—the areas that are now the Philippines, Malaysia, and Indonesia—and the Southeast Asian mainland. These settlers also brought with them techniques of rice cultivation. Bamboo instruments often are associated with animist Southeast Asian ceremonies that are connected to agriculture and propitiating local spirits.

Bronze technology, on the other hand, first became manifest in mainland Southeast Asia, in what is now Thailand and Vietnam, associ-



ated with communities with intensive agriculture, relatively dense populations, and some social stratification. The resources and specialized skill required for bronze technology meant it was available only to the elite class. Bronze technology supplements, but does not supersede, bamboo technology; instruments made of bronze might sound different from instrument made of bamboo, but musicians play similar parts on them. They are different solutions brought to bear on the same musical problem: how to produce musical instruments in an environment where everything rots quickly. But while bamboo music is often associated with agriculture, bronze instruments are more often associated with ceremonial music devoted to maintaining an orderly, hierarchical cosmos, as reflected in a social order with higher and lower classes. The expensive resources and specialized technology required for bronze reflect its greater social value and suggest not only a layering of cultural influences, but a layering of social classes as well.

Bronze-age Southeast Asian bronze drums (see Figure 1.4) provide an excellent illustration of class distinctions. The technical expertise involved in creating such finely-cast implements of such large size (some were as heavy as 200 lbs) suggests highly-specialized artisans working on behalf of upper-class patrons. The drums often are decorated with scenes of lavish rituals featuring musical instruments and elaborate costumes (Higham 1989). Whether the ceremonies were funerals, fertility rites, or celebrations of war victories, there is, according to archaeologist Charles Higham, little doubt that "participation in ceremonials was part of the aristocratic society" in Southeast Asia (Higham 1996:133).

But bronze technology did not remain limited to the upper classes of stratified societies; it long ago trickled down even to quite isolated cultures. On the island of Mindoro in the Philippines, for example, a

Figure 1.4. Above: An assortment of early Southeast Asian bronze drums (photo and print collection of the Koninklijk Instituut voor Taal-, Land- en Volkenkunde, Leiden, Netherlands). Above left: Motifs from bronze drums showing musical activities (Charles Higham, The Archaeology of Mainland Southeast Asia: From 10,000 B.C. to the Fall of Angkor, *Figure 4.10, p. 203. New York, 1989: Cambridge University Press.)*

small community of Hanunoo lives in the highland areas (into which they were long ago pushed by Tagalog and Bisayan farmers). While much of their music-making employs instruments made from wood and bamboo, they play bronze gongs in ensembles to enliven feasts and celebrations. These bronze gongs are acquired through trade with outsiders, and the Hanunoo consider them to be rare and valuable possessions (Maceda and Conklin 1955).

Very often both bronze and bamboo musical instruments bear names that imitate the sounds they make. The syllable "klung" in *angklung,* for example, captures the resonant quality of the bamboo rattling against the instrument's frame as the player shakes it. The Malay term *gong* is possibly a vocal rendition of the low, ponderous, visceral sound of a large gong. Speakers of Sundanese, one of the regional languages of Java, take the onomatopoeia one step further: their word "goong"

includes two syllables on the "o" sound to imitate the undulating waves of sound that the best gongs produce. The Cambodian, Thai, Lao, and Burmese names for a thick pair of cymbals—*chhing, ching, sing,* and *sì,* respectively—are similarly onomatopoeic.

Subsequent cultural waves in Southeast Asia added more and more layers of technology for Southeast Asian musical instruments. Ideas from the civilizations of India found receptive audiences in the peoples and cultures of Southeast Asia; the developing upper classes especially saw great potential in the notions of social class and kingship that accompanied Hinduism. They adapted the Indian belief that reflecting the organization of the cosmos through a powerful intermediary—a "king" who resided in both worlds and represented an interface between them—would lead to better lives.

Very often the names of these new musical instruments betray their origins. Among the instruments depicted on Hindu monuments are plucked stringed instruments with box resonators; a variety of modern Southeast Asian plucked string instruments, including *kudyapi* from the Philippines, *kacapi* from West Java, *krajappi* from Thailand, and *hasapi* from Sumatra, have names derived from the same Sanskrit root, *kacchapa,* which can refer to a particular kind of tree (*cedrela toona*); Jaap Kunst notes that the South and Southeast Asian instruments that have related names are all string instruments made from wood (Kunst 1973:371). Laced drums, too, are probably imports from India (Miller and Williams 1998:66). Such instruments are not as well-suited to the environment as bamboo and bronze instruments, but their association with desirable Indic ideologies may make worthwhile the extra effort required to make and maintain them.

The Middle East—the source of Islam, one of Southeast Asia's most successful imported religions—also contributed some new musical technologies. A Persian-Arabic bowed instrument called *rabab* is probably the prototype for various bowed spike fiddles with skin resonators with similar names in Southeast Asia. One of the names commonly given to frame drums (circular wooden frames with skins stretched across one side)—*rebana*—also reinforces the drum's Islamic source; it is, perhaps, derived from the Arabic word "Rabbana," which means "Our Lord!" and is the opening word for many short Arabic prayers (Kunst 1973:218).

European invaders also contributed musical instruments to Southeast Asian cultures. The violin (one of Europe's most exportable musi-

cal inventions) has become entrenched in a number of Southeast Asian contexts, and retains its European name (*biyula, biola*). Brass bands, with their connotations of pomp and circumstance, have also found a home among various Southeast Asian peoples.

No matter which layer of cultural influence musical instrument prototypes or names come from, Southeast Asian musicians learned to deploy their instruments in their own ways. Many Southeast Asian music traditions share several fundamental and flexible approaches to structuring and performing music; these approaches may be characterized as *musical processes*. Musical processes are too abstract to be called specific techniques for making or playing music, yet they are not exactly music theory, either. They are, rather, basic paradigms for organizing musical materials at their most elemental levels, and they may result in surprisingly different musical sounds. And an entirely different manifestation of the principle of layers seems to underlie the Southeast Asian musical processes that govern music-making.

Southeast Asian Musical Processes

Vocal music, which strictly speaking requires no technology at all, is a good starting place from which to explore Southeast Asian musical processes. Virtually all Southeast Asian cultures have rich traditions of vocal music, many of which involve the playing of musical instruments as well. There are some genres of song which are common to many Southeast Asian cultures, and these common genres persist through many historical layers of outside influences.

There are quite a few Southeast Asian traditions of epic narrative singing, for example; these typically feature a single singer-storyteller who takes an entire night to spin an episode from a well-known tale through narration and song. In the Kelantan province of Malaysia, a storyteller sings and narrates epic *tarikh selampit* tales, which recount the adventures of a folk hero named Selampit; the bard accompanies himself on a *rebab* (in Malaysia, a three-string fiddle) (Sweeney 1974; Matusky and Chopyak 1998:420). In *pantun Sunda* from West Java, Indonesia, a storyteller weaves tales from Sundanese mythology, and accompanies himself on a *kacapi* (boat-shaped zither) (Weintraub 1990:9). Among ethnic Lao in Thailand and Laos, the term *lam* is a generic designator for vocal music with flexible melodies; in *lam*

nithan, a solo singer presents epic stories drawn from stories about the Buddha (Miller 1998:325, 342) to the accompaniment of a *khaen* (Lao mouth organ). Most language groups in the Philippines maintain epic narrative forms that document local histories and local heroes, as well as ancestors and genealogies (Santos 1998:907). In the lowland, Christianized parts of the Philippines, groups of singers perform the *pasyon* (passion—a poetic rendition of Jesus Christ's crucifixion) during the season of Lent (Canave-Dioquino 1998:844–845). The content of the stories might change with different layers of cultural influence, but the means of performance—epic singing—remains constant.

Dialogue songs, in which participants exchange clever, sometimes sexually suggestive, verses which they might improvise on the spot or have memorized previously, are another widespread genre throughout Southeast Asia. In past times in Central Thailand, men and women in isolated villages sang various kinds of *phleng pün ban* ("songs of the village") to the accompaniment of hand-clapping or percussion instruments (Miller 1998:298–301). Northern Thai *saw* repartee songs, on the other hand, are accompanied by a small ensemble of instruments (Miller 1998:313), while each of the singers in Lao *lam klawn* dialogue songs has his or her own khaen-playing accompanist (Miller 1998:325). For *balitaw* songs from the Visayan islands in the Philippines, a woman and a man compete with one another to see who is cleverer at coming up with witty and romantic verses to the accompaniment of a guitar (Pfeiffer 1976:127; Canave-Dioquino 1998:851). Cloaking the often intimate sentiments of courtship in song helps to take the edge of embarrassment off meeting and wooing potential mates.

Ostinato and Simultaneous Variation

Examining the instrumental accompaniment for these vocal forms provides some insight into basic Southeast Asian musical processes. There are two fundamental approaches to Southeast Asian vocal music accompaniment: (1) *ostinato* and (2) *simultaneous variation. Ostinato* is a musical term that refers to a short rhythmic and/or melodic pattern or phrase that is repeated over and over (*ostinato* is the Italian word for "persistent" or "obstinate"). *Simultaneous variation* suggests performing concurrently two or more melodic lines, each of which is somehow recognizable as a variant of the same basic tune (some musicologists describe simultaneous variation with the term *heterophony*).

Listeners cannot help but become familiar with an ostinato quickly because it is short and persistently repeated; they soon come to rely on the ostinato's predictability. In this way, ostinato accompaniments provide a solid foundation upon which to build a cohesive vocal performance; no matter what the singer does next, his or her new material remains related to that which came before because it refers to the same ostinato. Using ostinatos as a principle for musical organization is not unique to Southeast Asia; musical traditions all over the world employ ostinatos at times, including Western popular music. For example, the hit song "Gloria," as sung by Van Morrison when he was a member of the group Them, features a four-beat chordal ostinato; the theme from the television series *The X Files* is based on an eight-beat ostinato pattern.

Ostinatos are ubiquitous in Southeast Asian musical traditions. In West Javanese *pantun Sunda,* for example, short ostinatos consisting of a few alternated pitches played with a regular pulse provide the sonic backdrop for various kinds of singing and narration (Weintraub 1990:61–63). In Visayan balitaw, the guitar provides a simple chordal ostinato to give shape to the verses (Pfeiffer 1976:127). In both cases, the ostinato accompaniment sets out a clear rhythmic pulse to give some temporal shape to the singers' melodic phrases. The ostinatos also emphasize a particular pitch or set of pitches, which provides tonal support for the melodies as well. By emphasizing a particular pitch, the ostinato creates the sense that a particular pitch is a tonal center or "home" pitch; by singing phrases that move away from and then return to the "home" pitch, a singer can create a sense of melodic direction and purpose.

In *tarikh selampit* accompaniment, on the other hand, the rebab part does not provide an ostinato; rather, it doubles or imitates the vocal part (Matusky and Chopyak 1998:420). It is a practical form of accompaniment in that it provides the singer a chance to collect his thoughts and take a breath, while filling in with the rebab. Simultaneous variation also capitalizes on the inherent differences in technique, and thus melodic idioms, that various musical instruments require.

These two styles of musical accompaniment—ostinato and simultaneous variation—are not absolutely mutually exclusive. In the various *lam* genres from Thailand and Laos, the khaen accompanist provides a steady rhythmic pulse and reiterates a drone pitch—creating a sort of ostinato—while improvising his own versions of the appropriate song melodies (Miller 1998:324). Thus, the khaen accompaniment lies

somewhere between ostinato and simultaneous variation. And, of course, the two accompaniment styles can be combined; in Northern Thai saw repartee songs, some of the instruments in the ensemble are percussion instruments and provide a rhythmic ostinato, while other instruments are melodic and provide simultaneous variations of the melody (Miller 1998:313).

Ostinato accompaniments tend to have a clear, regular rhythmic pulse. They are typically performed on struck percussion instruments or plucked string instruments, which can produce only musical tones that are not continuous—once a tone starts (as a consequence of striking a key or plucking a string), it immediately begins to fade away. For similar reasons, the musical pitches and timbres (tone colors) of ostinato instruments are fixed: unlike a voice, which can produce infinite gradations of pitch and timbre, struck or plucked ostinato instruments produce one single, discrete pitch at a time, and are uniform in timbre. There is, therefore, a marked contrast between ostinatos, with their regular pulse and discrete pitches and timbres, and vocal melodies (and any simultaneous variations), with their variable pitch and timbre and often flexible approach to rhythm. Fixed, regular ostinatos and free, variable melodies represent two layers of musical entities; like oil and water, the two layers do not blend together, and the result is a stratified, layered musical texture. Southeast Asian listeners typically find this dramatic contrast between "fixed" and "free" layers aesthetically pleasing.

The ostinato accompaniments for epic and courtship songs are typically played by a single performer (often the singer himself). Southeast Asian ensemble music often features several ostinato parts played by different performers on a variety of instruments. The way in which the ostinato parts are divided up among the players represents another widespread Southeast Asian musical process: interlocking parts. In addition, it models an important general aspect of Southeast Asian cultures: reciprocity.

Reciprocity and Interlocking Parts

Anthony Reid includes "the importance of debt as a determinant of social obligation" among the common social patterns he identifies in Southeast Asia (Reid 1988:6). By debt, he refers to the social bond that

Figure 1.5. Terraced rice fields in Bali (Henry Spiller)

grows between partners when they trade goods, services, or favors. Under ideal circumstances, the bond becomes permanent when neither side is entirely certain exactly how much is owed to the other party; the relationship is sustained by an interlocking pattern of giving and receiving. Both parties are "rich" because they share each other's wealth. The social benefits of these mutual reciprocal relationships seem to be greater than the sum of their parts.

Reciprocity also takes the form of mutual cooperation between individuals when it comes to agricultural concerns. The staple crop in most parts of Southeast Asia is rice; rice is a marsh plant that acquires nutrients not from the soil but rather from standing water. As a result, if rice is cultivated in a wet, marshy environment, it can be grown in the same plot year after year without exhausting the soil (Higham 1996: 322–323). The key to increasing rice yields in ancient Southeast Asia was to create irrigation systems that not only simulated marshy conditions, but provided control over the movement of water through the fields to create marshes only when they were needed. Intricate systems of hillside rice terraces, along with the canals and weirs that provide and control their water supply, are a hallmark of intensive agriculture throughout Southeast Asia (see Figure 1.5).

Individual farmers control the flow of water in and out of their fields; those working within these elaborate systems, however, must pay close attention to what goes on upstream (whence their water comes) as well as downstream (where their water drains). Not only must they make sure there is water available (and somewhere to send it), but they must also make sure that large areas of fields go dry for sustained periods of time to keep pests from getting out of hand (Lansing 1995: 99–101). The key to success is cooperation; the irrigation system is a complex network of individual fields, managed by equal and interdependent family groups (O'Connor 1995:997). When each family farm times its own needs to interlock with the needs of its neighbors, everybody profits; the yield is, once again, greater than the sum of its parts.

Given the great cultural rewards of reciprocity and cooperation in Southeast Asia, it is little wonder that Southeast Asian musicians, too, use interlocking parts to create a musical effect that is greater than the sum of its parts. A simple rhythmic ostinato consists of moments where the musician makes a sound separated by moments of silence. If each of several musicians plays a simple ostinato, but each times his or her part in such a way that its sounds occur when the other ostinatos are silent, the result is a stream of interlocking sounds that join together in the listener's ear to create one single, complex musical result. For audiences accustomed to the idea that intense cooperation is "natural," the results of interlocking musical processes cannot help but seem "beautiful."

Chapter 2

Music in Java and Bali

Chapter One introduced some Southeast Asian musical processes and situated them in historical and cultural contexts. The remaining chapters will focus on increasingly specific topics, first by discussing music from Indonesia's most densely populated islands (Java and Bali) in Chapter Two, and zooming in on Sundanese music and dance from West Java in Chapters Three and Four. Before proceeding, however, an overview of the modern nation-state of Indonesia is in order.

Like many of Southeast Asia's modern political boundaries, Indonesia's boundaries are an artifact of European colonialism; they coincide for the most part with the extent of Dutch control during the nineteenth and twentieth centuries. Indonesia includes thousands of islands (some very small) and as many as 300 language and ethnic groups. Major islands include Sumatra (home of the Toba Batak and quite a few other ethnic groups), Sulawesi (formerly known as Celebes), as well as Java and Bali. Indonesia controls most of the island of Borneo (the Indonesian part is called Kalimantan) and the western half of the huge island of New Guinea (the Indonesian part was called Irian Jaya until the year 2000, when it was renamed Papua; see Figure 2.1). Many of the small islands between Bali and Papua, such as Lombok, Sumba, Sumbawa, Roti, and Timor are populated as well. Most of the populated islands are the home of multiple ethnic groups, with distinct customs, languages, and belief systems. Nevertheless, these groups are, in many respects, united as Indonesians.

One of the reasons The Netherlands is such a wealthy country today is that it exploited the natural resources and agricultural potential of its "East Indies" colonies, reaping huge profits by utilizing the inexpensive labor the native population provided. Regardless of ethnic affiliations, then, every Indonesian shares the legacy of centuries of Dutch colonial exploitation and administration; this shared experience is a

Figure 2.1. Major islands of Indonesia (maps.com)

powerful unifier despite the cultural and geographical heterogeneity of the islands. Not all Indonesians believe that being part of Indonesia is a good thing for their particular region. East Timor, for example, resisted being subsumed into the Indonesian nation, and there are secession movements in Aceh (in northern Sumatra) and Papua as well. Advocates of separation believe that their local resources are filling the coffers of the central government (located on Java) without benefitting their own regions.

One way to prevent secession movements is to forge a national Indonesian culture—to make being an Indonesian citizen important to each individual who lives within the borders, regardless of his or her ethnic affiliation. The Indonesian government has developed a cultural policy that emphasizes shared artistic values in diverse regional traditions.

These new national meanings supplement the existing local and regional meanings to add yet another layer of complexity to Indonesian music. With its own layers of cultural influence, layers of musical processes, and layers of accrued meanings, Indonesia is something of a microcosm of Southeast Asia as a whole.

This chapter will examine how selected Indonesian gamelan traditions which manifest these common processes reflect also their own local histories and cultures. Of Indonesia's approximately 17,500 islands, Java and Bali are the best known to people outside of Indonesia. This chapter concentrates on these two islands, following a trajectory from west to east—starting on the northwest coast of Java in Cirebon, moving to Central Java, through East Java, to Bali, and even beyond to briefly examine Javanese and Balinese gamelan music's penetration into North America and Europe. Chapters Three and Four will return to West Java for a more detailed look at gamelan and dance traditions of the Sundanese people who live there.

The staggering variety of musical forms packed onto the two small islands of Java and Bali is a microcosm of the historical processes and diversity of Southeast Asia as a whole and Indonesia in particular. Contemporary Javanese and Balinese musics reflect the layers of cultural influences that are the legacy of the whole region—early inhabitants and invasions; Indic (Hindu and Buddhist) missionization; the coming of Islam; Portuguese, Dutch, and British colonialism; nationalism; and globalization.

The name "Java" is perhaps most famous in the West not as the name of an Indonesian island, but rather as the name of a computer programming language and as a slang word for coffee. The three usages are vaguely related—the programming language was given the name "java" to indicate that it was speedy, like someone who drinks too much coffee. And people began to use the word "java" to mean "coffee" because a lot of coffee was exported to the West from the Indonesian archipelago via the island of Java (some Dutch merchants long ago smuggled a coffee tree seedling from Arabia and found Java to be a place conducive to its cultivation, thus breaking an Arabian "monopoly" on the beans).

Java's significance in Indonesia stems from its population and political influence, which are, in part, the legacy of its important role in the coffee and spice trade. Its area of 51,007 square miles (132,618 square kilometers), about the size of North Carolina, makes it only the third largest island in the archipelago (the Indonesian islands of Sumatra and Kalimantan are larger). It has by far the largest population of any island in Indonesia—121 million (59 percent of the total population of Indonesia), according to the 2000 census (Statistik 2000). Indonesia's three largest cities (the national capital, Jakarta, with 10.8 million; Bandung with 3.8 million; and Surabaya with 2.7 million) are on Java (World Gazetteer 2002). Java was the center of several influential Southeast Asian empires—notably the Majapahit (thirteenth–sixteenth century) and the second Mataram (sixteenth–seventeenth century) kingdoms, and became the administrative center of the colonial Dutch East Indies and of the modern Indonesian nation as well.

Bali's claim to fame, in contrast, lies not in its size nor its political significance. It is a tiny island of only 2,147 square miles (5,582 square kilometers), about the size of Delaware, and has a total population of 3.1 million (Statistik 2000)—smaller than two of Java's cities! However, it boasts an international reputation as a paradise. Many people conflate Bali with the mythical South Pacific island named Bali H'ai created by James Michener in his book *Tales of the South Pacific* (and immortalized in song by Rodgers and Hammerstein for *South Pacific,* their play based on Michener's stories). The real Bali is thousands of miles away from the islands that inspired Michener; its reputation as a paradise is no less vivid, however. In the 1920s and 1930s several influential European and American anthropologists and artists, including Margaret Mead, Gregory Bateson, Walter Spies, and Colin McPhee, took

Figure 2.2. Map of Java and Bali

up residence there and regaled their readers with tales of Bali's warm climate, natural beauty, and artistic populace. The Indonesian government has capitalized on this reputation and continues to develop Bali as an international tourist destination. Figure 2.2 is a map of Java and Bali, with the locations marked for some of the places discussed later in the chapter.

Common features and organizational principles in musical traditions from different parts of Java and Bali point to some common origins. But the great variety in musical expression points to the different social, cultural, and political situations that different populations on the islands have experienced. This chapter will survey some representative musical traditions from Java and Bali and situate them both within a common historical and cultural context and in relation to one another. Examination of musical examples from these different traditions will illuminate common strategies as well as differences.

With regard to musical technology, Java and Bali have much in common with the rest of Southeast Asia. Many Javanese and Balinese musical instruments are made from a variety of readily available materials, such as bamboo and wood. The most prestigious instruments, however, are made of metal, usually bronze. Ensembles of bronze instruments, called *gamelan,* are one common feature of music throughout Java and Bali; the form of the instruments and the makeup of the ensembles, however, varies considerably from place to place. Another common characteristic of Javanese and Balinese music is the way in which it is organized into musical "layers" that remain distinct from one another yet combine to create a harmonious whole. Although the musical details of the layers themselves differ from one tradition to another, each layer serves one of four basic musical functions, and most traditions include all four functions. One final common characteristic: musicians

throughout Java and Bali memorize pieces in a condensed format, like an outline, which they flesh out at the time of performance. The pieces themselves, however, are quite different from tradition to tradition, as are the techniques by which the musicians expand them. An historical overview of Java and Bali helps to explain both the commonalities and the differences.

Brief Historical Sketch

Based on fossil evidence, archaeologists believe that humans have lived on the island of Java for one and a half million years (Lockard 1995:14). The current residents of Java, however, are not the direct descendents of the *homo erectus* population of prehistoric Java. Genetic, linguistic, and archaeological evidence suggests instead that the modern populations of Java and Bali descend from a wave of immigrants, originally from South China and Taiwan, who spread throughout island Southeast Asia, eventually reaching the coast of mainland Southeast Asia and the islands of Polynesia. This prehistoric movement of people is called the Austronesian expansion. It seems likely that these invaders, who reached Java in approximately 2000 BC, displaced or assimilated any existing populations. Ironically, the "original" Austronesians in South China and Taiwan were themselves displaced by the dominant Northern Chinese; their descendents survive today only as marginal aboriginal populations on Taiwan (Diamond 1999:334–353).

The subsequent history of Java and Bali involves wave after wave of foreign invasions; these later invaders, however, did not displace the Austronesian descendents as they had displaced their predecessors. Instead, they assimilated with the Austronesian Javanese. These later invaders contributed ways of thinking and strategies for living rather than genetic material; each new wave imprinted new ideas and concepts on top of the old ones.

Some of these early visitors, probably from northern Vietnam, brought bronze objects and technology in about 300 BC (Hood 1980:122), and possibly rice cultivation technology as well (Koentjaraningrat 1975:11). Among the artifacts associated with this wave were items that archaeologists call "bronze drums" because they appear to be tools for producing sound (Hood 1980:122), and perhaps for making rain (Kunst 1973:105). By 300 AD Javanese metalworkers had developed the imported technology of bronze casting and forging

and created new types of artifacts, including bronze gongs with central knobs on them (Hood 1980:122).

Hindu missionaries from India first arrived in the fourth (Koentjaraningrat 1975:13) or fifth (Kunst 1973:106) centuries AD. Javanese rulers soon adopted the trappings of Indian culture, including a concept of kingly rule that identified the monarch as a descendent of the gods whose primary responsibility was to preserve cosmic order by imitating it in the administration of his kingdom (Koentjaraningrat 1975:16; Osborne 1985:22). Indian Buddhist ideas also came to Java during the first millennium; over the course of time, the Javanese blended characteristics of Hinduism, Buddhism, and Javanese animistic practices into a uniquely Javanese religious system (Wright 1978:5–6). For example, uniquely Javanese versions of the Hindu epic stories Ramayana and Mahabharata emerged, which were not only recast in Javanese tongues but supplemented with new Javanese characters.

The last Hindu-Buddhist kingdoms on Java were Pajajaran (1333–1579) in West Java and Majapahit (1293–1514) in Central Java. Islam first took root in Java along the north coast; Islamic teachers adapted existing arts to help spread the new religion to other parts of Java. Islamic North Coast kingdoms managed to overthrow Majapahit, forcing Hindu aristocrats into exile on Bali. Another Islamic kingdom, called Mataram, rose to dominate Java in the sixteenth century; the royal courts of the powerful Mataram empire, based in Central Java, developed music and arts as symbols of their power and influence.

A European presence in Indonesia began with Portuguese traders in the early sixteenth century. It was Dutch colonial powers, however, which eventually dominated the spice trade from the island of Java. The Dutch maintained Mataram's aristocrats as local administrators for their colony, but factionalized them; out of this internal bickering grew several different royal courts. While the aristocrats of Java emulated many of the trappings of European royalty, they also cultivated practices that distinguished them from their European overlords. The different Central Javanese courts, in fact, stripped of any significant political power, competed with one another primarily in the arena of the arts. People in outlying areas, far from the center, emulated these court arts, and adapted them to suit local needs and purposes.

During World War II, the Dutch were displaced from their role as colonial masters of the Indonesian archipelago by the Japanese, who took control of many parts of Southeast Asia. Indonesian nationalists took the opportunity of Japan's defeat in World War II in 1945 to de-

clare an independent Indonesian nation. Although the Dutch attempted to regain control, Indonesia's independence was widely recognized, and by 1949 the Dutch withdrew.

The boundaries of modern Indonesia do not coincide with any particular cultural or linguistic divisions; they are artifacts of Dutch control. Indonesia's national motto, *Bhinneka Tunggal Ika* (Old Javanese for "unity in diversity") capsulizes the modern Indonesian nation's strategy for instilling a sense of common patriotism in a conglomeration of cultures brought together originally only by the accident of Dutch colonization.

The linchpin of a pan-Indonesian culture is the national language (which English-speakers call Indonesian, but which Indonesians call *bahasa Indonesia*). Virtually all Indonesians speak this national language, which is used in schools, government offices, and mass media. It is one very important manifestation of the "unity" part of the slogan.

The "diversity" part of the motto is reflected in the fact that Indonesian is a second language for most Indonesians, who typically speak some regional language as their first tongue. There are hundreds of these regional languages, which very often reflect older political, social, and cultural boundaries, allegiances, and identities. In Central and Eastern Java, the areas once dominated by the Majapahit kingdom, most people speak the Javanese language. In many parts of West Java, especially those areas formerly under the control of the Pajajaran empire, the dominant language is Sundanese. On the north coast, between West and Central Java, where a distinct political entity emerged with the coming of Islam in the fifteenth century, many people speak a Javanese dialect known as Cirebonese. In some isolated pockets of East Java, locals speak a dialect of Javanese, called bahasa Osing, that most speakers of standard Javanese can barely understand. The language around the national capital city of Jakarta is a mix of Malay and a host of local languages, reflecting the diversity of its residents, many of whom relocated to the Jakarta area in search of economic opportunities.

Origins of Gamelan

In his book *Music of the Roaring Sea* (Hood 1980), ethnomusicologist Mantle Hood weaves a fanciful fictionalized account of how a Javanese chieftain might have acquired and developed an ensemble of bronze

drums in 300 BC. Hood's fictionalized chieftain was initially terrified by the supernatural sounds he heard emanating from the ships of an invader; eventually, however, he found a way to vanquish the invader and seize the bronze drums (along with the musicians who played them) as his own. Hood suggests that the bronze drums' obvious supernatural power, along with several very practical uses to which they were put as signalling devices, led to their adoption and development on Java, and eventually to the cultivation of bronze instrument making and the creation of modern gamelan music.

However it happened in reality, bronze percussion ensembles have played an important role in the cultures of Java and Bali for thousands of years. In kingdoms all over the world, ritual objects were (and are) an important symbol of the "divine right" to rule (consider the crown jewels of England, for example). Medieval Hindu-Javanese kingdoms, too, had their share of heirloom crowns and gems. Their collection of ritual objects that symbolized the legitimacy to rule included musical ensembles consisting primarily of metal percussion instruments—*gamelan*. Javanese especially valued weapons and utensils made of bronze—not only because of their superior utility, but because of bronze's supernatural associations, which stemmed from the metal's origins in elemental substances (metal ores) and elemental forces (fire). In addition, the music played on the instruments mimicked the cosmic order of the universe; the very act of having it performed was one way in which Javanese kings fulfilled their obligation to preserve cosmic order. Different cultures and groups on Java have found ways to change gamelan music to fill new niches and perform new functions, combining the old with the new. The following sections will describe some of these metamorphoses.

Java's Islamic North Coast

Java's north coast has long been the location of the island's international ports; Islamic traders from West Asia used routes that pass by Java's north-coast ports on their way to China since the earliest days of Islam. It is not known exactly how or why any residents of Java converted to Islam, but it seems unlikely that it was because of any sort of coercion or conquest by Islamic traders or forces. What is clear is that Islam first made a significant impact in Java among Javanese beginning in the sixteenth century in some of the cosmopolitan north-coast cities.

Legend, supported to some extent by historical documentation, holds that a small cadre of charismatic Javanese individuals, usually called the *wali sanga* (nine saints), was primarily responsible for spreading Islam in Java. They also established powerful Islamic states based along the northern coast of Java and eventually overthrew the last of the Hindu-Javanese kingdoms, establishing Islam as Java's predominant religion. The rulers of these states eventually assumed Islamic royal titles such as *sultan,* while simultaneously maintaining many of the Hindu-Javanese notions of king and cosmos, and thus became the embodiment of a peculiarly Javanese combination of indigenous, Indic, and Islamic ideas.

Initially, the most powerful of the north-coast Islamic states was Demak (in eastern Java). It was eventually overshadowed by its satellite state at the western end of Java, Banten. A third city, Cirebon, located about halfway between Banten and Demak, also became the capital of an important kingdom. Of the three, only Cirebon retains any vital remnants in the present of this glorious past in the form of several palaces, called *kraton,* which are still home to the royal descendents of the rulers of Cirebon—the sultans and their families.

The residents of Cirebon hold that the Cirebon kingdom was founded by one of the nine saints, Sunan Gunung Jati, who was the only wali to become a king (Suanda 1999:686). Sunan Gunung Jati acquired some rank in Demak by marrying a relative of its powerful ruler; he subsequently established himself as the king of the then-new north coast state of Banten (at the western end of Java) in 1526; some years later he moved to Cirebon and assumed the Islamic royal title of Sultan (Ricklefs 1993).

One of the reasons the nine saints succeeded in their missionary efforts was their keen sense of how to insinuate Islamic ideas into the already existing sociopolitical fabric of Hindu-Javanese kingdoms. It was important to the leaders of the new Islamic kingdoms to establish legitimacy to rule in a way that their subjects could understand. One means for accomplishing this was to appropriate the symbols of the divine right to rule, including gamelan ensembles. The people of Cirebon believe that the traditional arts were created by the nine saints; for this reason the traditional arts in Cirebon are considered to have Islamic significance despite their obvious roots in pre-Islamic Javanese arts (Suanda 1999:687). It is a testament to the success of the nine saints in integrating Islam into a Javanese way of life as well as a clear illustration of a Javanese penchant for layering the new on top of the old.

Gamelan Sekaten

There are legends that suggest that three heirloom sets of gamelan instruments were taken from Majapahit for the purposes of transferring the Majapahit rulers' legitimacy upon their north-coast conquerors when the north coast states overthrew Majapahit in the sixteenth century. Other stories suggest that the nine saints manufactured the sets after Majapahit models (cf. Surjodiningrat 1971:1). Both versions emphasize that gamelan ensembles and gamelan music provided continuity with the past to ensure a transfer of divine authority to the new Islamic rulers.

It was the Muslim king of Demak who began the tradition of having the heirloom gamelan played during a festival honoring the birthday of the prophet Muhammed as a means for attracting his Javanese subjects to Islam by conflating the trappings of Hindu-Javanese authority and legitimacy—gamelan music—and the attractive power of a festival with Islamic personages and ideals (Pemberton 1994:96). These heirloom gamelan are known today as *gamelan sekaten* or *gamelan sekati* and the festival at which they are played is called *sekaten*. People in Cirebon consider gamelan sekaten to be the most Islamic type of gamelan (Suanda 1999:687).

Gamelan sekaten is a good starting point for discussing Indonesian gamelan music for several reasons. Because of its great age, we can imagine that its musical style is reminiscent of pre-Islamic gamelan music. Its musical structure provides some insight into how gamelan music might mimic the organization of the cosmos. Many of the musical principles that govern sekaten music are apparent in more modern gamelan styles. And, finally, the instrumentation of Cirebon gamelan sekaten represents a "generic" gamelan ensemble in some significant ways.

Gamelan Instruments

The term "gamelan" is thought to come from the Javanese word *gamel*, which means "to handle," in the sense of managing or presenting something (Sumarsam 1995:319–320 fn. 5); in other words, the term "gamelan" might suggest the process of making gamelan music, which involves treating or handling a basic musical idea. The word "gamel" also refers to a type of hammer (Kunst 1973; Lindsay 1979:9). This term is particularly appropriate for the metal percussion instruments

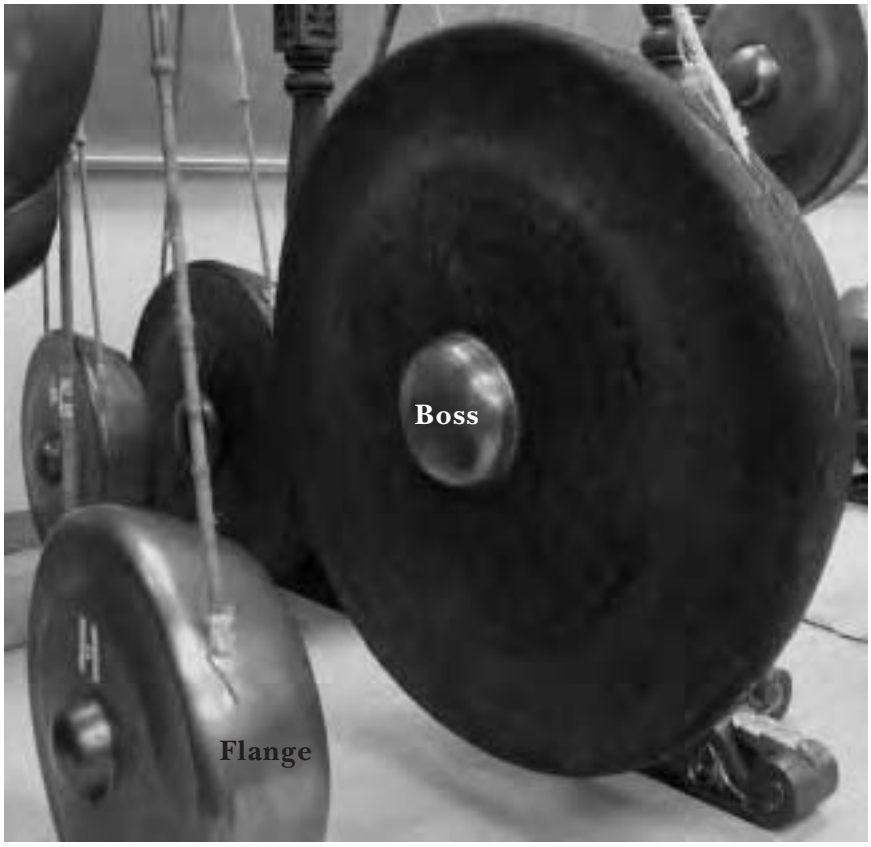


Figure 2.3. Bossed (knobbed) gong; a large Central Javanese gong ageng surrounded by a number of smaller kempul (Henry Spiller)

that dominate gamelan ensembles because it suggests how the instruments are played (they are hit with some sort of hammer or mallet) as well as how the instruments are made (they are hot-forged and hammered into shape). Some Javanese musicians divide bronze gamelan instruments into two basic categories: *pencon* (or *penclon;* instruments composed of bossed or knobbed gongs) and *wilahan* (instruments with bronze slab keys) (Kartomi 1990:89; Sorrell 1990:28–29; see also Sutton 1999:640–641).

Knobbed Gong (Pencon) Instruments

Generally speaking, a gong is a metal percussion instrument that has a circular flat surface; sometimes the edge of the surface is turned over to form a "lip" or a "flange." Usually flat gongs do not have a definite pitch;

Figure 2.4. Gong chimes in Museum Prabu Geusan Ulun in Sumedang. Left: jengglong; right: bonang (Henry Spiller)

an example is the large flat gong that is sometimes played in symphony orchestras, called a *tam-tam*. When hit, a tam-tam makes a raucous, jangling sound; most people would find it impossible to hum or sing a single pitch that emerges from the tam-tam. Southeast Asian gongsmiths learned a long time ago that adding a raised knob called a "boss" to the center of the flat circular surface helps to focus the gong's pitch (see Figure 2.3); musicians hit the gong on the boss with some sort of padded mallet to produce a sound with a pitch that is much more clearly identifiable than that of a tam-tam. In Indonesia, the term *pencon* (or *penclon*) refers to these bosses and to gongs that have such bosses.

A variety of Indonesian musical instruments are made from one or more bossed gongs. Gongs can be suspended horizontally from ropes and struck from the side, or laid vertically on their flanges over ropes and struck from above. The thickness of the gong's various surfaces, along with its size and weight, determines its pitch; the softness or hardness of the mallet with which it is struck affects its *timbre* (the quality or "color" of the sound). Sometimes the lips of Indonesian gongs are very deep, and the instrument looks more like an overturned kettle or pot.

A bossed gong instrument may consist of a single large (or small) gong. Very often, however, a series of gongs with different pitches is arranged on a frame to create a *gong chime,* which usually is played as a melodic instrument (see Figure 2.4). Sometimes the players of gongs

Figure 2.5. Keyed instruments from a Cirebonese gamelan accompanying topeng. Left to right: peking, saron, saron (courtesy Michael Ewing)

and gong chimes stop a gong's vibrations after striking it by firmly pressing the mallet back onto the boss, or by touching it to damp the vibrations.

Slab Key (Wilahan) Instruments

Slab key instruments consist of four to fifteen or more rectangular metal bars (called "keys" in English and *wilahan* in Indonesian) arranged left-to-right, from largest to smallest (so that the lowest pitch is on the player's left and the highest pitch is on the player's right) on top of some sort of stand or frame. The frame also usually provides some sort of resonating chamber—an enclosed space under a key that helps to amplify the key's sound by reflecting and reinforcing its vibrations—as well. Musicians hit the keys with a mallet or hammer; the timbre depends in a large part on the hardness or softness of the mallet. Because the keys are made of metal, the resulting sound can ring on for quite some time. For this reason, most of the time musicians also stop or damp the sound of the ringing key by firmly pinching or touching the key until it stops vibrating (see Figure 2.5).

Bossed gong and slab key instruments in Java and Bali come in a variety of types, shapes, sizes, and pitch levels, with different numbers of

Figure 2.6. Kyahi Mega Mendung (Cirebonese gamelan in the Museum Sonobudoyo in Yogyakarta) (Henry Spiller)

keys or gongs and ranges, different kinds of resonators, and different playing techniques, all of which result in a surprising variety of timbres. In gamelan ensembles, the keyed and gong instruments of various sizes and shapes are given some semblance of a uniform appearance by mounting them on stands with shared decorative motifs and paint colors.

Sundanese and Javanese musicians sometimes emphasize the integrity and unity of these sets of instruments by bestowing a proper name upon them. Each set of gamelan instruments has a unique character based on its sound as well as its appearance. In the courts of Central Java, gamelan names often begin with the honorific title Kyahi (often translated into English as "The Venerable" or "Sir") followed by a poetic combination of words rich with symbolic associations, for example, *Kyahi Guntur Madu* ("The Venerable Rush of Honey"). Some gamelan names evoke the particular quality of the ensemble's collective voice, such as *Kyahi Udan Mas* ("The Venerable Golden Rain"). A gamelan originally from Cirebon, but now kept in the Museum Sonobudoyo in Yogyakarta is named *Kyahi Mega Mendung* (see Figure 2.6). This poetic image—dark storm clouds—evokes not only the gamelan's sound, but its appearance as well. The instrument cases have intricate carving

Figure 2.7. Mega mendung batik motif (Source: Batik Patterns. *1999. Boston: Shambhala Publications)*

based on one of Cirebon's emblematic *batik* (wax-resist dyed cloth with intricate patterns) motifs, also called *mega mendung* (see Figure 2.7); it symbolizes life-giving rain (Tim Yayasan Mitra Budaya Indonesia 1982:149), and also provided its original owner, a princess from Cirebon who married into a Yogyanese royal family, a nostalgic reminder of home. In West Java, gamelan names often include the more intimate honorific "Si," such as *Si Manis* ("Dear Sweet One").

One of the most important qualities that distinguishes one set of gamelan instruments from other is its tuning. Instrument makers carefully tune each instrument in a gamelan to match the others, and it is only rarely possible to exchange instruments between gamelan. Despite this uniqueness, individual gamelan tunings follow the general outlines of one of two main tuning systems.

Tuning Systems

Something must vibrate for humans to hear a sound; the quality of sound that depends on how fast or slowly something vibrates is called *pitch*. Westerners generally relate pitches to one another not by thinking of them as "faster" or "slower," however, but rather as "higher" or "lower." When one pitch vibrates exactly twice as fast as another pitch, a curious thing happens; although one pitch is perceived to be much higher than the other, the two pitches are nevertheless heard to be somehow "the same." The musical distance delimited by these two pitches is called an *octave* in the West.

Although there are arguably an infinite number of discrete pitches within the span of a single octave, most musical systems do not make use of all of these infinite pitches. Musicians and listeners limit themselves to a much smaller set of discrete pitches, along with standards for varying and adjusting those pitches (these standards are generally called *intonation*). We typically evaluate musicians by how accurately they conform to our expectations for intonation (there are few judgments that challenge a performer's basic musicianship skills more than declaring, "She plays out of tune"!).

The human voice, along with some instruments (such as a violin), is capable of producing infinitesimal gradations of pitch; other instruments, however, are permanently set to a limited number of discrete pitches. Each key on a piano, for example, is tuned to exactly one pitch more or less permanently. Although there are eighty-eight keys on a standard piano, there are only twelve keys (and twelve discrete pitches) within each octave span on the piano. The relationship among the pitches to which those twelve keys are tuned is the piano's *tuning system.* The term for the distance between any two pitches is *interval.* Because the interval between any two adjacent piano keys is tuned to sound exactly the same as the interval between any other pair of adjacent keys, we can call the piano's tuning system a *twelve-pitch equidistant tuning system;* in other words, the octave is divided into twelve intervals, each of which we perceive as being the same size as the others.

A tuning system provides a basic pitch vocabulary, but not all the pitches need to be included in every piece. The keys on a piano, for example, can be divided into two basic categories: "white keys" which are the larger keys in front, and "black keys" which are narrower, shorter, and further back. Much conventional Western music uses only a subset of these keys at any given time; the piano's "white keys," of which there are only seven per octave, represent one of the fundamental subsets of pitches that Western music uses; one possible term for a subset of a tuning system is *scale.* The piano's white-key scale has two different sizes of intervals; the larger intervals are twice as large as the smaller intervals (because the larger intervals are the sum of two of the intervals created by the twelve-pitch equidistant tuning system). We therefore can call this subset of piano keys a *seven-pitch non-equidistant scale* (it is more commonly called a *diatonic* scale, however, which denotes a particular kind of seven-pitch non-equidistant scale in which there are two small intervals and five large intervals, and the small intervals are not close to each other).

One system for measuring and comparing intervals is called the Ellis "cents" system, developed by the nineteenth-century phonetician Alexander Ellis. He began with the piano's twelve-pitch equidistant tuning system and mentally divided each of the intervals into 100 infinitesimal pieces, called cents. Thus, a complete octave contains 1,200 cents. The pitch difference in a 1-cent interval is too small for most human ears and brains to perceive, but most people can distinguish between two notes that are a few cents apart. Expressed using cents, the two small intervals of the piano white key scale are each 100 cents; the five large intervals are each 200 cents.

Javanese Tuning Systems

Like the keys of a piano, each of the gongs or keys on bronze gamelan instruments is tuned more or less permanently to a discrete pitch. Most bronze ensembles in Java and Bali are tuned to a variant of one of two main tuning systems, called *pelog* and *slendro* (spelled *salendro* in the Sundanese language). Pelog is a seven-pitch non-equidistant tuning system; that is, the intervals between the seven pelog pitches vary in size from very small (about 90 cents) to very large (more than 400 cents). Slendro is a five-pitch equidistant tuning system; that is, the intervals between the five slendro pitches are approximately the same size (1200 cents divided by 5 equals 240 cents).

The white keys on any piano are tuned exactly the same as on all other pianos, because all piano tuners use a single standard to tune each note. There are standards both for determining the pitch of each note (for example, the standard pitch for the key labelled "A" near the middle of the piano keyboard is 440 vibrations per second) as well as for the intervals between each note (how much higher or lower one note is compared to another).

Javanese gamelan tuners, however, do not adhere to a single standard, either for pitch or for the size of intervals, but instead strive to give each set of gamelan instruments they tune a unique version of slendro or pelog. Because the instruments are always played as a set, unlike Western instruments which are interchangeable from one ensemble to another, intonation differences between gamelan sets present few practical problems. Those who listen to gamelan music, in fact, appreciate the intonation differences between one gamelan and another. Each set of instruments imparts its own subtle character into all the pieces the musicians play on it. The exact boundaries between

what sounds acceptably "in tune" and what sounds "out of tune" are difficult to nail down, and are the subject of much passionate discussion among Javanese musicians.

So, although both the piano white keys and pelog are seven-pitch non-equidistant tuning systems, they are really quite different. That being said, it *is* possible to internalize a crude approximation of how the pelog tuning system sounds by comparing it to a piano's diatonic ("white-key") scale. Many people can sing a diatonic scale using traditional solfège syllables—*do re mi fa sol la ti do* (and those who cannot do so already can learn quickly by watching the first half-hour of the Rodgers and Hammerstein musical *The Sound of Music*). Remember, however, that this represents a very crude approximation. If there is one certainty about Javanese tunings, it is this: The "do-re-mi" diatonic scale sounds absolutely *awful* as pelog.

Gamelan Sekaten in Cirebon

Cirebonese gamelan sekaten are tuned to a version of this basic seven-pitch pelog scale. And, like most gamelan ensembles, gamelan sekaten include both wilahan and pencon instruments. The pencon instruments include two large hanging gongs (called *gong*), a large one-row gong chime called *bonang,* and a small, horizontal gong called *ketuk* or *kajar.* The wilahan instruments are of two sizes; the larger, lower-pitched ones are called *demung,* while the smaller, higher-pitched one is called *titil.* The ensemble is filled out with a flat, unbossed gong called *beri, cret,* or *kecrek.* There also is one non-bronze instrument: a large drum called *bedug* (Kunst and Kunst-van Wely 1923:35; North 1988:4,5) (see Figure 2.8).

The names of many Indonesian musical instrument are onomatopoeic in that they are verbal imitations of both the timbre of the instruments and the style in which they are played. The name "gong," for example, is a verbal imitation of the sound a large, low-pitched gong makes when it is struck and allowed to ring. Similarly, the second syllable of the name "ketuk" (that is, "tuk") evokes the sound a higher-pitched gong makes when struck and damped. The "i" vowels and "t" consonants in the name "titil" suggest the delicate, high-pitched, and relatively fast-moving melody of the instrument it describes, while the "u" vowel and "m" and "ng" consonants in "demung" capture the more