SE Asia comprises a collage of continental terranes derived directly or indirectly from the India–Australian margin of eastern Gondwana. The Late Palaeozoic and Mesozoic evolution of the region involved the rifting and separation of three elongate continental slivers from eastern Gondwana and the successive opening and closure of three ocean basins, the Palaeo-Tethys, Meso-Tethys and Ceno-Tethys. The Sukhothai Island Arc System, including the Linchang, Sukhothai and Chanthaburi terranes, is identified between the Sibumasu and Indochina–East Malaya terranes in SE Asia and was formed by back-arc spreading in the Permian. The Jinghong, Nan–Uttaradit and Sra Kaeo sutures represent the closed back-arc basin. The Palaeo-Tethys is represented to the west by the Changning–Menglian, Chiang Mai/Inthanon and Bentong–Raub suture zones. The West Sumatra and West Burma blocks rifted and separated from Gondwana, along with Indochina and East Malaya in the Devonian, and together with South China formed a composite terrane ‘Cathaysialand’ in the Permian. They were translated westwards to their positions outboard of the Sibumasu Terrane by strike-slip tectonics in the Late Permian–Early Triassic at the zone of convergence between the Meso-Tethys and Palaeo-Pacific plates. SW Borneo is tentatively identified as possibly being the missing ‘Argoland’ that separated from NW Australia in the Jurassic. Palaeogeographical reconstructions for the Late Palaeozoic and Mesozoic illustrating the tectonic and palaeogeographical evolution of SE Asia are presented.
Gondwana-derived continental slivers (now disrupted into various terranes), with the successive opening and closure of the Palaeo-Tethys, Meso-Tethys and Ceno-Tethys ocean basins. This broad scenario is still advocated here (Fig. 4), but recent new data demand modification of the terrane make-up of these continental slivers, and also reinterpretations of the origins and boundaries of some of the terranes in the region.

Terranes derived from Gondwana in the Devonian. A group of East and SE Asian terranes are interpreted to have rifted and separated from Gondwana as an elongate continental sliver in the Devonian (Fig. 4) and comprise North China, South China (including Hainan), Indochina–East Malaya (including the Qamdao–Simao/Simao and disrupted West Sumatra and West Burma terranes) and Tarim (including the disrupted Kunlun, Qaidam and Ala Shan terranes). The West Sumatra terrane was proposed by Hutchison (1994) and Barber & Crow (2003), and is interpreted to have been translated westwards from ‘Cathaysia-land’ (combined South China–Indochina–East Malaya composite terrane in Permo-Triassic times) as suggested by Barber et al. (2005) and Metcalfe (2005). A Devonian separation of these terranes from Gondwana is still advocated here based on palaeomagnetic and biogeographical data from the terranes themselves and also from Devonian age data for oceanic radiolarian cherts in the Palaeo-Tethys (for details, see Metcalfe 1988, 1990, 1998, 2005). Jablonski & Saitta (2004) have, however, on the basis of transgressive–regressive sequences in western Australian basins, argued for a later Early Carboniferous (Viséan) separation of South China, Indochina and Simao terranes. This timing seems too young in view of the fact that the Palaeo-Tethys suture zone includes oceanic sediments of Devonian age and no post-Devonian Gondwana biota is reported from the terranes in question.

Terranes derived from Gondwana in the Early Permian. The second continental sliver that rifted and separated from Gondwana in the Early Permian (with opening of the Meso-Tethys) was the Cimmerian continent of Sengor (1979, 1984), which included the Sibumasu terrane (Metcalfe 1984) of SE Asia and the Baoshan and Tengchong terranes of Yunnan in western China. I have presented evidence for the NW Australian origin and Early Permian rifting and separation of the Sibumasu portion of the Cimmerian continent from Gondwana in a series of papers (e.g. Metcalfe 1986, 1988, 1990, 1991, 1993, 1996a, b, 1998, 2001, 2002, 2005, 2006) and this will not be repeated here. Recent studies (Sone & Metcalfe 2008) have led to the recognition of an island arc system, the Sukhothai Island Arc system, through SE Asia (Fig. 5) situated between Sibumasu and Indochina–East Malaya (from which it was derived by back-arc spreading). This interpretation,
together with recognition of the West Sumatra terrane and extension of the Bentong–Raub suture through the tin islands of northern Sumatra, dictates some modification of the boundaries of the Sibumasu Terrane (Figs 2 and 3). The newly proposed Sukhothai Island Arc system includes the Linchang, Sukhothai and Chanthaburi terranes (Sone & Metcalfe 2008) and is broadly equivalent to the ‘Sukhothai zone’ originally defined as the ‘Sukhothai fold belt’ by Bunopas (1982, fig. 139).
in Thailand. The previously recognized Inthanon Zone (= Inthanon Fold Belt of Bunopas) in Thailand is here interpreted as part of the Palaeo-Tethys suture Zone (Fig. 5) following Sone & Metcalfe (2008).

Use and abuse of the terms ‘Shan-Thai’ and ‘Gondwana–Tethys/Cathaysia Divide’. The Sibumasu Terrane (Metcalfe 1984) is the Gondwana-derived terrane in SE Asia that included parts of western Thailand, Burma, western Peninsular Malaysia and NW Sumatra, characterized by the presence of late Carboniferous and early Permian glacial–marine diamictites (Fig. 6) and late Palaeozoic strata with Gondwana affinity faunas and floras. This terrane, as defined, is not equivalent to the Shan-Thai Terrane of Bunopas (1982), which was defined as including ‘eastern Burma, western Thailand and northwestern Malay Peninsula’, but some workers have equated, and continue to equate Shan-Thai with Sibumasu. It is here stressed that these are not equivalents and the terms should not
be used interchangeably. Matters have been made worse recently with some proposals to apply the term ‘Shan-Thai’ to include Cathaysian elements of Thailand (e.g. Hirsch et al. 2006; Ishida et al. 2006; Ferrari et al. 2009), introducing further confusion of the originally defined Gondwana Shan-Thai Terrane. The ‘Shan-Thai Block’ of Hirsch et al. (2006) and Ferrari et al. (2009) in fact includes both continental terranes and suture zones (see Hirsch et al. 2006, fig. 2; Ferrari et al. 2009, fig. 5), which is an unacceptable oversimplification and composite grouping of very different tectonic units.

Confusion has also arisen relating to the major Late Palaeozoic biogeographical boundary recognized through East and SE Asia that separates Gondwana faunas and floras from Cathaysian faunas and floras. This major biogeographical divide has been termed the ‘Gondwana–Tethys Divide’ or ‘Gondwana–Cathaysia Divide’ by some workers and has been used to mark the boundary between Gondwana-derived continental terranes in the west, with Early Permian cold- or cool-climate sediments and biota, from warm-climate equatorial Cathaysian continental terranes to the east (Ueno 2003; Metcalfe 2005). It was the recognition of this major biogeographical divide, coupled with Late Carboniferous–Early Permian diamictites interpreted to be of glacial–marine origin, that led to models of Gondwana dispersion and Asian accretion of terranes derived from Gondwana (e.g. Metcalfe 1988, 1990). The Gondwana–Cathaysia biogeographical divide has been taken by some workers to indicate the boundary between

<table>
<thead>
<tr>
<th>Terrane</th>
<th>Origin</th>
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<tr>
<td>North China</td>
<td>N. Australia</td>
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<tr>
<td>South China</td>
<td>Himalaya–Iran region of Gondwana</td>
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<tr>
<td>Sibumasu</td>
<td>NW Australia</td>
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<tr>
<td>Indochina</td>
<td>Eastern Gondwana</td>
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<tr>
<td>East Malaya</td>
<td>Western Gondwana</td>
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<tr>
<td>West Sumatra</td>
<td>Eastern Gondwana (Cathaysia–land)</td>
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<tr>
<td>West Burma</td>
<td>Eastern Gondwana (Cathaysia–land)</td>
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<td>Lhasa</td>
<td>Himalayan Gondwana</td>
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<tr>
<td>Qiangtang</td>
<td>Himalayan Gondwana</td>
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<tr>
<td>Simao</td>
<td>Eastern Gondwana: South China</td>
</tr>
<tr>
<td>Lincang</td>
<td>Indochina–East Malaya (Cathaysia–land)</td>
</tr>
<tr>
<td>Chanthaburi</td>
<td>Indochina–East Malaya (Cathaysia–land)</td>
</tr>
<tr>
<td>Kunlun</td>
<td>NE Gondwana? Originally part of Tarim?</td>
</tr>
<tr>
<td>Qaidam</td>
<td>NE Gondwana? Originally part of Tarim?</td>
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<tr>
<td>Ala Shan</td>
<td>NE Gondwana? Originally part of Tarim?</td>
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<tr>
<td>Tarim</td>
<td>Australian Gondwana?</td>
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<td>Hainan</td>
<td>Australian Gondwana?</td>
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<td>Kurosegawa (Japan)</td>
<td>North China margin</td>
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<td>South Kitakami (Japan)</td>
<td>NW Australia (Argoland)</td>
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<tr>
<td>East Java</td>
<td>NW Australia (Argoland)</td>
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<td>Bawean</td>
<td>NW Australia (Argoland)</td>
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<td>Paternoster</td>
<td>NW Australia (Argoland)</td>
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<td>West Sulawesi</td>
<td>NW Australia (Argoland)</td>
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<td>Mangkalihat</td>
<td>NW Australia (Argoland)</td>
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<tr>
<td>East Sulawesi</td>
<td>New Guinea region of the Australian margin</td>
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<td>Banggai-Sula</td>
<td>New Guinea region of the Australian margin</td>
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<td>Buton</td>
<td>New Guinea region of the Australian margin</td>
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<td>Obi-Bacan</td>
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<td>Buru-Seram</td>
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<td>West Irian Jaya</td>
<td>New Guinea region of the Australian marginal</td>
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<td>SW Borneo</td>
<td>Cathaysia–land or NW Australia (Argoland)?</td>
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<tr>
<td>Semitau</td>
<td>Cathaysia–land (South China–Indochina margin)</td>
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<td>Lucoma</td>
<td>Cathaysia–land (South China–Indochina margin)</td>
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<td>Kelabit–Longbowan</td>
<td>Cathaysia–land (South China–Indochina margin)</td>
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<td>Spratley Islands–Dangerous Ground</td>
<td>Cathaysia–land (South China–Indochina margin)</td>
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<td>Reed Bank</td>
<td>Cathaysia–land (South China–Indochina margin)</td>
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<tr>
<td>North Palawan</td>
<td>Cathaysia–land (South China–Indochina margin)</td>
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<td>Paracel Islands</td>
<td>Cathaysia–land (South China–Indochina margin)</td>
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<tr>
<td>Macclesfield Bank</td>
<td>Cathaysia–land (South China–Indochina margin)</td>
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Gondwana terranes and Cathaysian terranes (e.g. Ueno 1999; Ueno & Hisada 1999, 2001) and also used to identify the position of the Palaeo-Tethys suture as corresponding to the Mai Yuam Fault in Thailand (Ueno & Hisada 2001; Ueno 2003). This is an unfortunate interpretation, because Cathaysian faunal elements in seamounts occurring within the Palaeo-Tethys suture zone have been misinterpreted to indicate that the suture lies further to the west. This was particularly illustrated by Hirsch et al. (2006, fig. 2), who placed the Gondwan–Tethys divide in Peninsular Malaysia west of stable continental margin limestones (Kanthan Limestone, Kinta Valley) that contain Gondwana faunas. Hirsch et al. also showed a ‘Pattani Suture’ in the Gulf of Thailand and extending into Peninsular Malaysia delineating the eastern margin of their ‘Mae Sariang Zone’ yet did not provide any description of or justification for this suture zone.

Terranes derived from Gondwana in the Late Triassic–Late Jurassic. Metcalfe (1990) interpreted western Burma, which was named the Mount Victoria Land block, as a terrane derived from NW Australia that represented the missing ‘Argoland’ continental fragment that must have rifted from that region in the Jurassic. This terrane was later named West Burma (Metcalfe 1996a, b) to avoid nomenclatural confusion with Mount Victoria in Antarctica. Correlation of the Mogok Belt in Burma (which forms the boundary between Sibumasu and West Burma) with the Medial Sumatra Tectonic Zone separating Sibumasu from the Cathaysian West Sumatra Block suggests that the West Burma terrane represents a continuation of the West Sumatra Block (Barber & Crow 2009). Barber & Crow (2009) also pointed out that Middle Permian fusulinids from Karmine, Burma (Oo et al. 2002) are Cathaysian in nature and similar to Middle Permian faunas of the West Sumatra Block, supporting their interpretation. The West Burma Block is therefore here regarded as a Cathaysian terrane that was derived from the CathaysiaLand superterrane together with the West Sumatra Block in the Permian. If this interpretation is accepted, then the West Burma Block must have been derived from Gondwana in the Devonian as part of the Indochina–East Malaya terrane. This leaves the identity of ‘Argoland’ yet to be established. One possibility (A. J. Barber, pers. comm.; Hall 2009; Hall et al. 2009) is that SW Borneo might be a candidate. I previously considered this...
but ruled it out on the basis that Cathaysian faunas were known from the Carboniferous–Lower Permian Terbat Limestone on the Sarawak–Kalimantan border. If, however, these limestones form part of the Kuching zone (accretionary complex) or the small Semitau Block, and not the core of the SW Borneo Block, then SW Borneo becomes a candidate for the ‘Argoland’ block. This would be supported by the occurrence of diamonds in headless placers (placer diamond deposits...
without any obvious local or regional diamond source) in SW Borneo (Fig. 6), which could well have been derived from NW Australia. New information is also now available on the small Gondwana-derived continental fragments located in eastern Indonesia. Recent provenance studies have identified an Australian Gondwana-derived East Java terrane (Smyth et al. 2007). The Bawean Arch and Paternoster Platform pre-Cenozoic continental blocks (Manur & Barraclough 1994) are also possibly of Australian Gondwana origin but hard data supporting this are at present lacking. Other small continental blocks postulated to have had their origin on the Mesozoic margin of Australian Gondwana include the West Sulawesi Block (which has been linked with the East Java terrane) and the Mangkalihat Block in NE Borneo. It is possible that these microcontinental blocks (numbered 1–5 in Fig. 3) may in fact represent a single disrupted terrane derived from NW Australia (Hall 2009).

**Tectonic and palaeogeographical evolution**

**Late Palaeozoic**

Palaeomagnetic, biogeographical and tectonostratigraphic data suggest that a continental sliver comprising North China, Indochina (including East Malaya, West Sumatra and West Burma), Tarim and South China rifted and separated from eastern

![Fig. 6. Map of mainland SE Asia, showing the distribution of Late Carboniferous–Early Permian glacial–marine sedimentary rocks and major alluvial diamond deposits. Inset photograph shows dropstone in glacial–marine diamictite oriented vertical to bedding, Singa Formation, Langkawi Islands, Peninsular Malaysia. Abbreviations as in Figure 2.](image-url)
Gondwana in the Devonian, and Palaeo-Tethys opened between this sliver and Gondwana (Metcalfe 1996a, b). By Late Devonian–Early Carboniferous times, significant spreading had occurred in the Palaeo-Tethys ocean but some connection with Gondwana probably remained in the east (Metcalfe 2001) and endemic shallow-marine faunas characterized by *Chuiella* developed on the western portion of this separating continental sliver (Chen & Shi 1999; Fig. 7). Tarim collided with Siberia in the Late Carboniferous to Early Permian and was firmly welded to Asia by the Middle Permian (Carroll et al. 1995). Late Early Carboniferous floras of Indochina–East Malaya and South China are very similar (Laveine et al. 1999), suggesting a continental connection between these terranes at that time. Tectonostratigraphic data also indicate that these terranes collided and fused in the Carboniferous along the Song Ma Suture (Metcalfe 2001) to form a superterrane, here termed Cathaysialand (Fig. 8). Palaeomagnetic data indicate that North China remained in equatorial to low northern latitudes during the Carboniferous–Permian between Cathaysialand and NE Pangaea (Nie 1991). During the Permian, Cathaysialand and North China, which were situated within the Tethys ocean and largely isolated from the rest of Pangaea, developed the characteristic terrestrial flora and shallow-marine faunas of the Cathaysian biogeographical province. The Cathaysian equatorial flora is distinctly different from the cooler climate contemporaneous northern Angara and southern Gondwana floras, and coeval equatorial American and Euramerican floras of Pangaea (Fig. 9). Shallow-marine faunas are also distinctive and include endemic forms (e.g. the conodont *Pseudosweetognathus*; see Fig. 8b).

During the Permian a second continental sliver, the Cimmerian continent (Şengör 1979, 1984), the eastern portion of which is the Sibumasu Terrane, rifted and separated from eastern Gondwana and drifted northwards to collide with Cathaysialand (Fig. 8). As this terrane separated and moved northwards, it exhibits a progressive change in marine provinciality from peri-Gondwanan Indoralian Province faunas in the Asselian–Sakmarian to endemic Sibumasu Province faunas in the middle Permian to Cathaysian Province faunas in the Late Permian (Shi & Archbold 1998; Ueno 2003). The northwards latitudinal change, isolation from Gondwana, then amalgamation with Cathaysialand is reflected in the change from cool-climate or -water conditions to warm-water or -climate conditions and in the changing biogeographical affinities of faunas and changing ecosystems. During the northwards drift of Sibumasu, the Palaeo-Tethys was subducted beneath northern Pangaea, North China and Cathaysialand. Subduction beneath Cathaysialand resulted in the opening of a back-arc basin and development of the Sukhothai Island Arc terranes probably

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**Fig. 7.** Reconstruction of eastern Gondwana in Late Devonian to Early Carboniferous (Tournaisian) times showing the postulated positions of the East and SE Asian terranes. Also shown is the distribution of the endemic Tournaisian brachiopod genus *Chuiella*. NC, North China; SC, South China; T, Tarim; I, Indochina–East Malaya–West Sumatra–West Burma; QI, Qiangtang; L, Lhasa; S, Sibumasu; SWB, SW Borneo; WC, Western Cimmerian Continent.
Fig. 8. Palaeogeographical reconstructions of the Tethyan region for (a) Early Early Permian (Asselian–Sakmarian), (b) Late Early Permian (Kungurian) and (c) Late Permian (Changhsingian) showing relative positions of the East and SE Asian terranes and distribution of land and sea. Also shown is the Late Early Permian distribution of
developed over thin continental crust (Lincang, Sukhothai and Chanthaburi terranes) that originally formed the margin of Indochina (Fig. 8c). The back-arc basin then collapsed and closed to form the Jinghong, Nan–Uttaradit and Sra Kaeo sutures (Sone & Metcalfe 2008). Collision of the Sibumasu terrane with the Sukhothai Island Arc terranes and Cathaysialand closed the southeastern Palaeo–Tethys in the Permian–Triassic producing the Changning–Menglian, Inthanon and Bentong–Raub suture zones. The precise timing of collision of Sibumasu with Indochina–East Malaya is

Fig. 9. Distribution of Early Permian floral provinces plotted on (a) present-day geographical map, and (b) Early Permian palaeogeographical map. KT, Kurosegawa Terrane. Other abbreviations as in Figure 2.
debated. Metcalfe (2000) suggested a Late Permian–Early Triassic collision for the Bentong–Raub suture segment based on a range of constraining data, and based on interpretation of radiolarian cherts of Triassic age belonging to the Semanggol Formation and equivalents in western Peninsular Malaysia and Sumatra having formed in a successor basin rather than being deposited on Palaeo-Tethys ocean floor. This timing was challenged by several workers, who suggested a Late Triassic or even Jurassic collision based on interpretation of the Semanggol cherts and equivalents as Palaeo-Tethyan deposits (e.g. Sashida et al. 1995, 1999, 2000a, b; Kamata et al. 2002; Hirsch et al. 2006; Ishida et al. 2006; Ueno et al. 2006). Barber & Crow (2009) supported a latest Permian collision and suggested that the Semanggol and equivalent Triassic cherts formed in a successor basin(s) over the foreland fold-and-thrust belt as suggested by Metcalfe (2000). There are, however, valid arguments for a younger (late Triassic) collision and suturing to the north along the Changning–Menglian suture in SW China (Liu et al. 1996).

During the Late Permian–Early Triassic collision of Sibumasu and Indochina–East Malaya, and as a result of Cathaysialand being located at the zone of interaction between the north-moving Meso-Tethys and west-moving Palaeo-Pacific plates, it is postulated here, following the suggestion of Barber & Crow (2003) and Barber et al. (2005), that the West Sumatra and West Burma terranes (as an initial single unit later split by the opening of the Andaman Sea) were translated westwards to their current biogeographically unexpected positions outboard of the Sibumasu Terrane by largely strike-slip translation. A land connection (which may have been temporary) between Indochina and Pangaea in the Late Permian is indicated by the confirmed presence of the Late Permian tetrapod vertebrate *Dicynodon* in Laos (Fig. 8c). It is not known if this connection was via South and North China (most likely), or via the western Cimmerian continent, or both. The timing of collision between South and North China, along the Qingling–Dabie–Sulu suture zone has long been controversial, with Mid-Palaeozoic, Late Palaeozoic and Late Triassic–Jurassic timings being proposed.

A Permian to Early Triassic collision is here interpreted. This is based on studies of low-grade meta-morphic rocks in the Sulu belt (Zhou et al. 2008), and geochronological and structural data (e.g. Faure et al. 2003) indicating Permian subduction of South China beneath North China. In addition, identification of a Devonian–Triassic accretionary wedge that includes eclogites, and that formed a coeval volcano-plutonic arc that stretches from the Longmen Shan to Korea, supports subduction beneath the Qinling–Sino–Korean plate and a Permian–Triassic collision (Hacker et al. 2004).

**Mesozoic**

During the Triassic, welding of Sibumasu and Cathaysialand continued and collision with North China was largely completed by Late Triassic times (Fig. 10). Comparisons of apparent polar wander

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Fig. 10. Palaeogeographical reconstructions of the Tethyan region for the Late Triassic (Rhaetian) showing relative positions of the East and SE Asian terranes and distribution of land and sea. Abbreviations and sea shading as in Figures 7 and 8.
Fig. 11. Palaeogeographical reconstructions for Eastern Tethys in (a) Late Jurassic, (b) Early Cretaceous and (c) Late Cretaceous showing distribution of continental blocks and fragments of SE Asia–Australasia and land and sea. SG, Songpan Ganzi accretionary complex; SC, South China; QS, Qando–Simao; SI, Simao; QI, Qiangtang; S, Sibumasu I, Indochina; EM, East Malaya; WSu, West Sumatra; L, Lhasa; WB, West Burma; SWB, SW Borneo; NP, North Palawan and other small continental fragments now forming part of the Philippines basement; M, Mangkalihat; WS, West Sulawesi; P, Paternoster; B, Bawean; PA, incipient East Philippine arc; PS, Proto-South China Sea; Sm, Sumba. M numbers represent Indian Ocean magnetic anomalies.
paths of North and South China imply that collision between these blocks did, however, continue in the Jurassic but was complete by the Late Jurassic. The time of rapid (1° Ma⁻¹) relative angular velocity between the two plates (225–190 Ma) coincides with a peak in U–Pb and Ar–Ar dates obtained from metamorphic rocks in the Qingling–Dabie–Sulu suture (Gilder & Courtillot 1997). Thus, the initial consolidation of what is now East and SE Asia took place in Late Triassic–Jurassic times. Palaeo-Tethyan ocean crust trapped between the western Cimmerian continent, Cathaysia, North China and Siberian Pangaea was covered by thick Triassic deposits eroded from adjacent collisional orogens and became the Songpan Ganzi giant suture knot (Fig. 10). The Meso-Tethys was probably at its widest at this time and further rifting of the Indian–Australian margin of Gondwana was initiated and continued into the Jurassic. Separation of a further collage of small terranes took place in the Jurassic, the Ceno-Tethys ocean opening behind these terranes as they drifted northwards. The continental fragments that separated from Gondwana at this time are somewhat uncertain but are here interpreted to include the Lhasa, SW Borneo, East Java, Biwean, Paternoster, Mangkali-hat, West Sulawesi and Sumba blocks (Fig. 11). The timing of rifting and separation of the Lhasa block from Gondwana has seen much debate over the years. An early separation in the Permian, along with other elements of the Cimmerian continent as part of a ‘Mega-Lhasa Terrane’ has been proposed by some workers (e.g. Allegre et al. 1984; Dercourt et al. 1993, 2000). Others have argued for a later separation in the Late Triassic–Early Jurassic (e.g. Metcalfe 2002; Golonka 2007), and this timing is still advocated here and supported by information on oceanic cherts from the Yarlung–Zangbo suture (Matsuoka et al. 2002) and recent palaeomagnetic data (Otofuji et al. 2007). Few data are available from the Banggong suture zone between the Lhasa and Qiangtang terranes to constrain the age range of the ocean that the suture represents. An earlier separation in the Permian may be supported by Permian limestone blocks interpreted as possible seamount caps in the Indus–Yarlung suture zone (Shen et al. 2003). Little is known of the precise age of separation and northwards drift of the other small Australian-derived continental blocks now located in Java, Borneo and Sulawesi, but Jablonski & Saïtta (2004) have suggested that these microplates separated and migrated successively in the Hettangian, Oxfordian, Kimmeridgian and Tithonian based on megasequence studies and transgressive–regressive cycles in the Perth Basin and Westralian superbasin. Interestingly, Jablonski & Saïtta (2004) did not refer to the Lhasa block at all and did not show this on their palaeogeographical reconstructions. They provided little evidence for the identification of the blocks rifting at different times. By Late Cretaceous times the Lhasa block was welded to East Asia and SW Borneo and the other small continental fragments now found in the Java–Borneo–Sulawesi region had approximately reached their current positions relative to Indochina and other SE Asia blocks (Fig. 11c).

Conclusions

The Late Palaeozoic and Mesozoic evolution of SE Asia involved the rifting and separation of three collages of continental terranes (probably as elongate slivers) from eastern Gondwana and the successive opening and closure of three ocean basins, the Palaeo-Tethys, Meso-Tethys and Ceno-Tethys.

The Palaeo-Tethys is represented in SE Asia by the Changning–Menglian, Chiang Mai/Inthanon and Bentong–Raub suture zones.

The Sukhothai Island Arc System, including the Linchang, Sukhothai and Chanthaburi terranes, is identified between the Sibumasu and Indochina–East Malaya terranes in SE Asia and was formed by back-arc spreading in the Permian. The Jinghong, Nan–Utaradit and Sra Kaeo sutures represent the closed back-arc ocean.

The West Sumatra and West Burma blocks rifted and separated from Gondwana, along with Indochina and East Malaya in the Devonian, and formed a composite terrane ‘Cathaysia’ with South China in the Permian.

West Sumatra and West Burma were translated westwards to their positions outboard of the Sibumasu Terrane by strike-slip translation in the Late Permian–Early Triassic at the zone of convergence between the Meso-Tethys and Palaeo-Pacific plates.

SW Borneo is tentatively identified as possibly being the missing ‘Argoland’ that separated from NW Australia in the Jurassic.

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