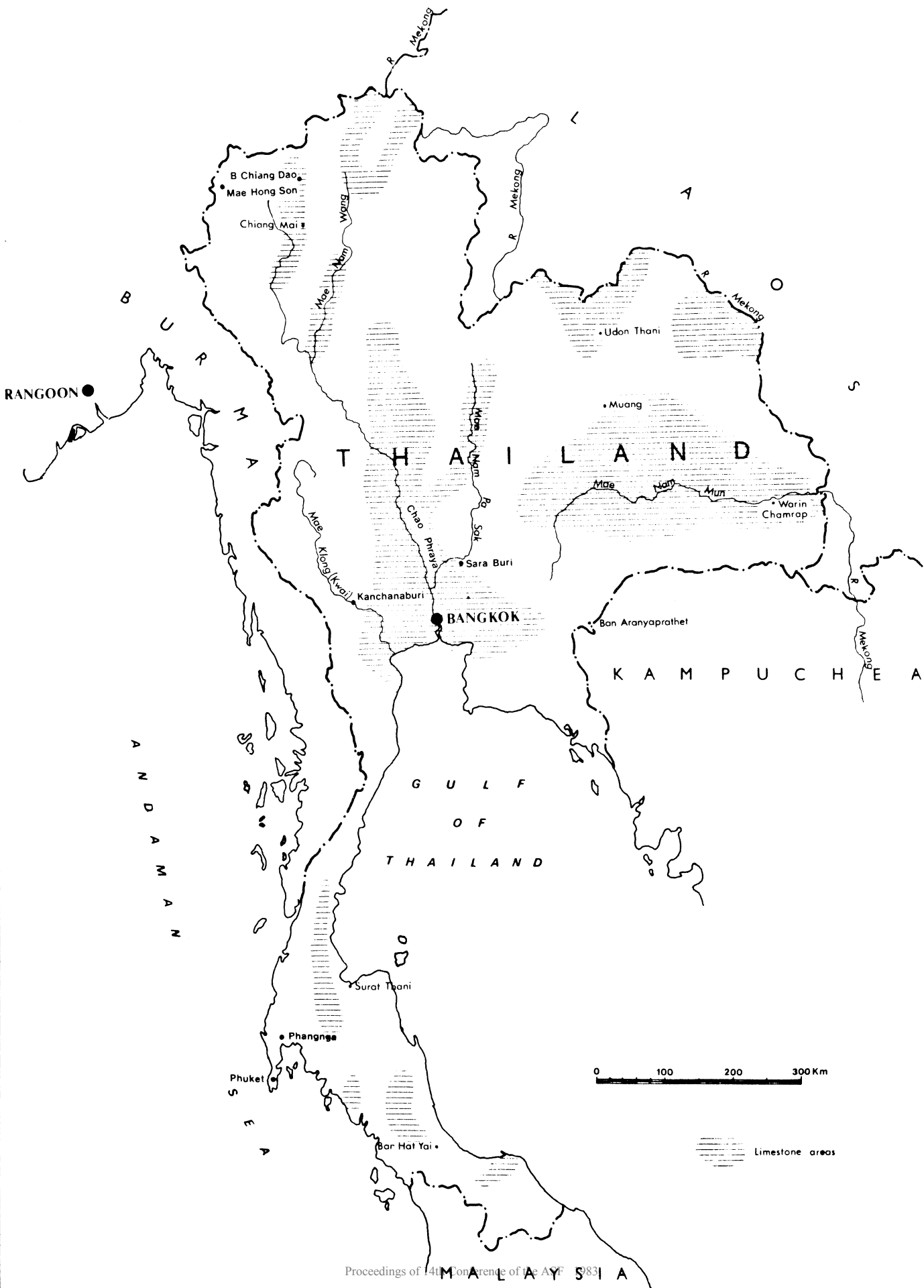
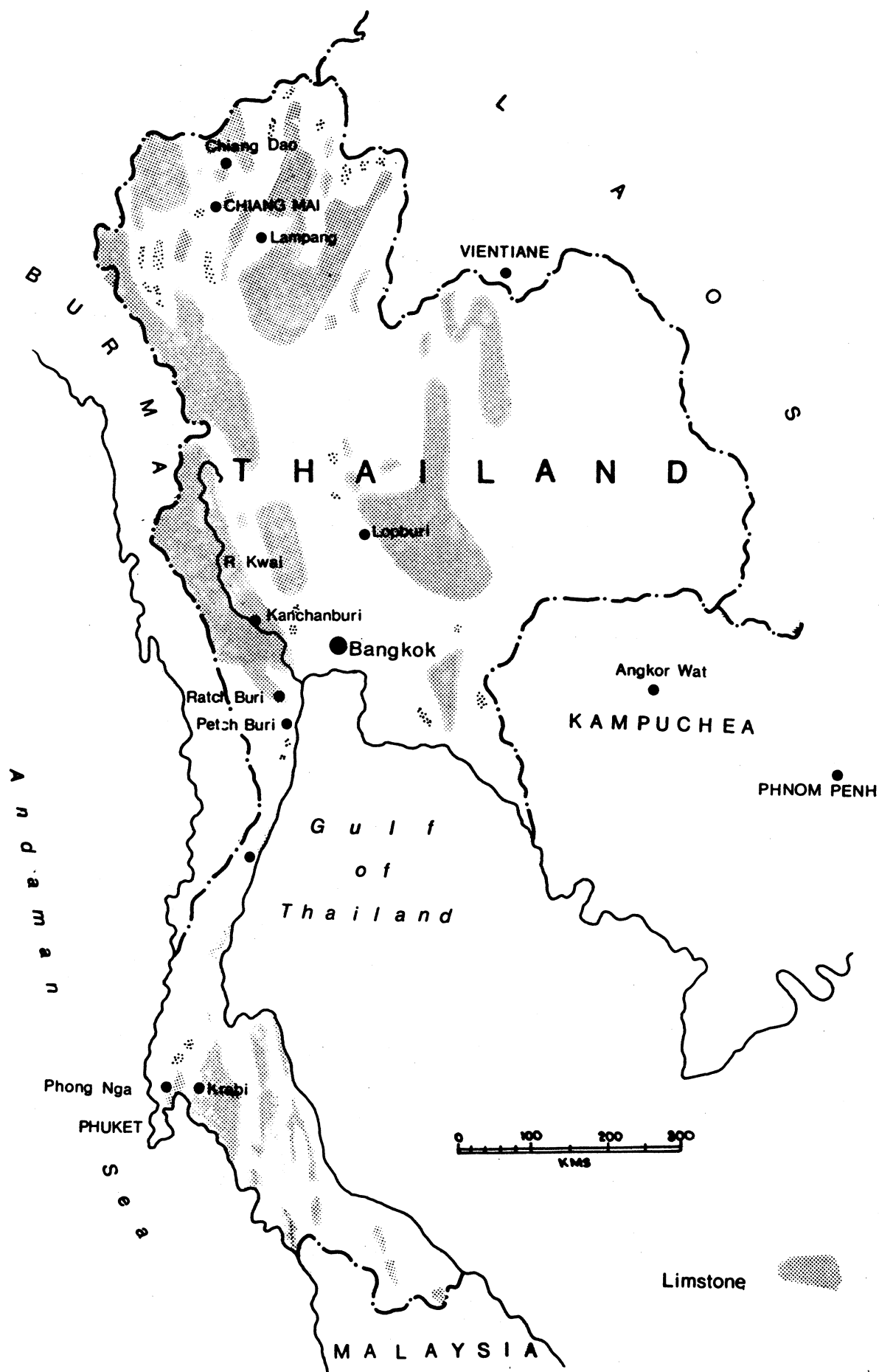






KARST & CAVES OF THAILAND

A Reconnaissance Report

by

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C.S.S.

Carbonate bedrock occurs over approximately 20% of Thailand. The limestone regions tend to be exposed as long narrow isolated belts following the lineation of mountain chains, trending from NNE/SSE to ENE/SSW. Local relief is commonly 300-400m in the south, to as much as 1,700 at Chiang Dao in the far north.

Karst topography is widely distributed. Tropical karst towers predominate in the south, where aligned belts and ridges extend discontinuously for over 600km. In the far north, altitude modifies climate and there are significant areas of a more temperate doline karst with extensive underground drainage and dolines up to 400m deep.

Caves are widespread and a preliminary field reconnaissance turned up 200. The longest may be Chiang Dao Cave, north of Chiang Mai, a tourist cave said to extend 10 to 14km, opening at the foot of a massive limestone mountain rising a further 1,700m above the entrance. Good scope exists for vertical caves of the order of 500-1000m in this region. Distribution of known caves correlates with settlement patterns and many have been discovered only in the last 20 years or so. Much of Thailand is still very thinly inhabited but access is much easier in recent years. The scope for exploration is enormous.

Thailand covers an area of 514,000 square kilometres, twice as large as Victoria and almost as large as France. Climatic range over its north-south extent of 1,500 km varies from equatorial through monsoonal to altitude-modified warm temperate conditions in the far north.

Carbonate rocks are found over approximately 20% of the total area of the country. Prior to World War 2, only reconnaissance geology was available, but progressive surveys have increased the known area of limestone. Indeed, I was shown caves quite close to major towns, in large limestone outcrops not even included on geological maps. The most common outcrops are of Permo-Carboniferous Ratburi Limestone, a light grey crystalline rock in which recrystallization, at places forming marble, is common, and which is sometimes dolomitized. Less common but occurring widely in the south is the dark to black Ordovician Khung Song Limestone.

The limestone regions tend to be exposed as long, narrow belts following the lineation of mountain chains in an elongated S-shape trending from NNW/SSE to NNE/SSW. Local elevations are typically of the order of 100 to 400 metres, especially in the south and centre, but much greater exposures are reached in the far north, up to a maximum of 1700m at Ban Chiang Dao. In nearly all cases the limestone extends below local base level.

The relatively resistant limestones produce perhaps the most spectacular features of the Thai landscape, and a preliminary survey suggests at least four broad karst types. I stress that this division is largely descriptive and is based on exhaustive study of available topographic maps, plus several weeks of casual field reconnaissance.

TOWER KARST

Tropical karst towers predominate in the south, in Peninsula Thailand and in isolated outcrops around the margins of the central Chao Phraya valley. Where beds are steeply dipping, the towers are commonly elongated and aligned along the strike, separated by long narrow, enclosed glades. Aligned belts of towers extend discontinuously for over 600km down the Peninsula, entering the sea in spectacular fashion at Phangnga Bay, near Phuket.

CONE KARST

An extensive field of star-shaped and elongated cockpit-type depressions is discernible on some 1:50,000 maps, notably to the east of Sara Buri in central Thailand. It is likely that this type of karst will turn out to be more widely distributed as more detailed maps become available.

PLATEAU KARST

North-west of Kanchanaburi, the River Khawe Noi (Kwai) drains an enormous area of folded limestone with scattered, unremarkable karst features and few known caves. This area is thinly settled, covered with dense monsoon thicket forest (increasingly logged), and has been notable mainly for archaeological excavations and latterly, tourism. As recently as 1960, access to these caves was described as requiring transport by ten elephants, but tourists now employ buses and speedboats and some caves are in National Parks.

DOLINE KARST

This term is used loosely to describe significant areas in the far north where numerous depressions, ranging from small dolines to large poljes (?) pit the surface of limestone plateaux. Altitude ameliorates the sub-tropical climate here, precipitation is very heavy, and other land-form assemblages of a humid temperate type include sinking streams, through caves, springs and active and fossil horizontal steam caves.

CAVES AND CAVING POTENTIAL

Although much of the remoter limestone is still difficult of access throughout the country, there is so much that months could be spent in leisurely and civilized exploration, using only public transport and based in acceptable hotels.

A preliminary count has produced 200 caves and rather more features worth speleological attention. The distribution of caves is closely related to settlement patterns, and many were described as having been discovered only in the last 10 to 20 years. This is certainly the case with many of the semi-tourist caves open to the public. A surprising proportion of Thailand was virtually uninhabited until the 1960s and 1970s, and significant areas, especially limestone country, are shown on recent 1:50,000 maps as totally devoid of roads, tracks or villages.

In the tower karst, caves tend to be massive in size if not length, frequently with roof collapses and extensive dry decoration. Cliff foot caves may be found and the towers are commonly pierced by active or fossil stream caves. In Phangnga Bay, tourist boats pass at sea level through several such caves. At late stage there is collapse of the centre of the tower itself, but prior to this some towers, such as the renowned swallow cave of Ko Phi Phi, are little more than empty shells.

The longest known cave is at Chiang Dao in the far north. Year round, over one km is open to tourists and in the dry season guides apparently operate 8-hour trips into the far reaches of the cave, which is said to extend to 10 to 14km directly under Ban Chiang Dao Mountain. In trying to check this in January, 1983, Paul Greenfield and I were stopped by water passages, but confirmed the existence of large higher level passages beyond the tourist section. The mountain is entirely limestone and towers 1700m directly above the cave entrance. More exploration is warranted.

Further north still is a horizontal tourist cave, Tham Tab Tao, which debouches at the foot of a limestone massif. The map shows a suggestive alignment of dolines on the plateau above the probable trend of the cave, extending 5km due west of the entrance. Local information was that exploration is incomplete, the cave having been penetrated for "half a day" beyond the 1km tourist section.

Close to the north-west corner of Thailand and extending across the border from Burma is a massive limestone plateau towering 400 to 700m out of a deeply entrenched gorge. Even the 1:250,000 map shows the plateau pitted with numerous depressions. A 30km long stream, Namlang, drains several hundred square km of limestone, penetrates a large through cave and sinks in a polje-type depression below 400m high cliffs.

To the south of this the limestone plateau is almost uninhabited and, according to local information, largely unknown. 10km to the north east, at the village of Ban Mae Lara, another long stream disappears in a polje (?), rising 8km further west on the Huai Pong Saen Pik. We were unable to get into any of the sinks and did not have time to reach the three or four risings to the west. However we were assured that at least one of these is readily enterable.

CAVE USAGE

As elsewhere, caves in Thailand have proven archaeologically valuable and prehistoric artifacts have been recovered in the River Kwai area and more recently near Mae Hong Son.

A surprising number of caves are open for public inspection, many have generator-powered electric lighting, visitation is quite high and there is a thriving postcard industry. There is a well-developed local tourist trade; one temple cave near Phangnga was recording about 4,000 non-Thai visitors a year because the enterprising abbot had placed it on the Phuket - Phangnga Bay tourist circuit. A count of 27 such tourist caves reveals 3 or 4 developed purely for tourism or recreation, one (Ko Phi Phi) is exploited primarily for swallows nests, and the rest are associated with a Buddhist temple. I was told that the quiet and solitude of caves and rock shelters appeals to many Buddhist monks, but the income from the often self-guided cave inspections is clearly a motivating factor as well. There has been some small infrastructure investment in tourist caves in several places I visited, and plenty of potential.

SUMMARY

With 100,000 square km of limestone in a warm, humid environment, Thailand has tremendous scope for cave exploration and study, and it is surprising to find almost no previous reports. The greatest prospects are in the far north where long horizontal caves are already known and there is vertical potential of the order of 500 to 1000m. Road access is improving rapidly, public transport and accommodations are excellent, the scenery spectacular and the people most hospitable. The stunning karst towers in Phangnga Bay are probably the finest in the world and are grossly underrated as a tourist attraction.

The most productive exploration could probably be done by a group of 4 or 5 working in the far north and north-west, but there is plenty to occupy even one or two cavers with a week or so to spare.