

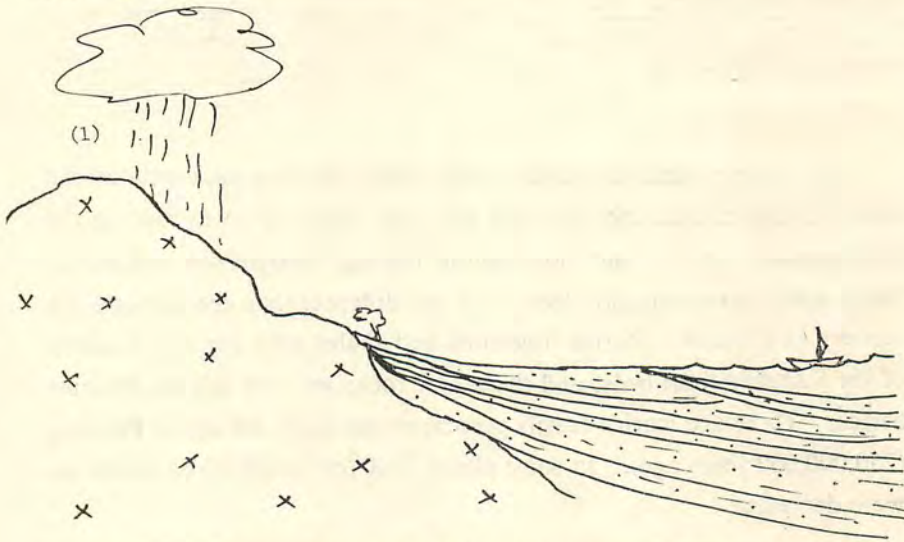
# THE GEOLOGICAL HISTORY OF KHAO YAI

by  
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The topographic features which are viewed today in areas in and around Khao Yai are a culmination of several cycles of sedimentary deposition, uplift, and erosion, interspersed with periods of volcanic activity. The term culmination may not be a good one as the dynamic forces, which are at work in the Himalayas today, are surely making their presence known in the mountains which extend through Thailand into Malaysia and Indonesia. Nevertheless, Khao Yai does appear at this moment to be in a quiet stage in which erosion is the predominant geological force—and has been for some few millions of years since volcanic flows poured forth, covering a vast area along the western margin of the Korat plateau.

But let's back up some 300-400 million years and look at this area as it was then, speculating on its history as can be interpreted from the rocks.

In the Paleozoic Era, and the exact age cannot be determined for a couple of reasons, (we guess at Silurian, Devonian or Carboniferous age; however, there are no index fossils to help, or those that might have existed have been destroyed by metamorphism) it is certain that the area was being fed by sediments from a land mass, who knows where. Sediments were carried from the eroding hills or mountains by streams onto a coastal plain, possibly into nearby shallow lagoonal waters. Nearly 10,000 feet (3,000 m) of these sediments were deposited. See the first drawing.



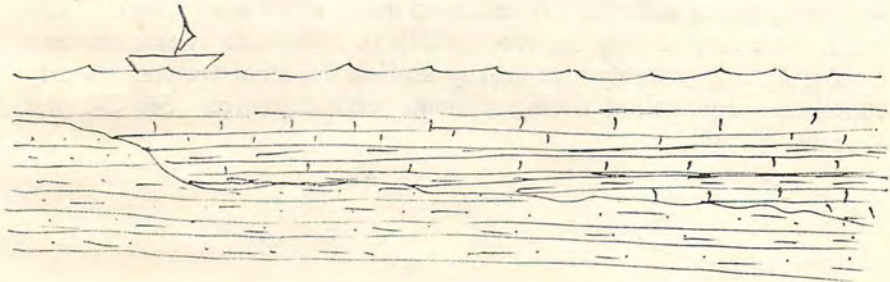
\* Environmental Sciences Division, ARPA. A lecture given during one of hiking tours to Khao Yai in 1971.

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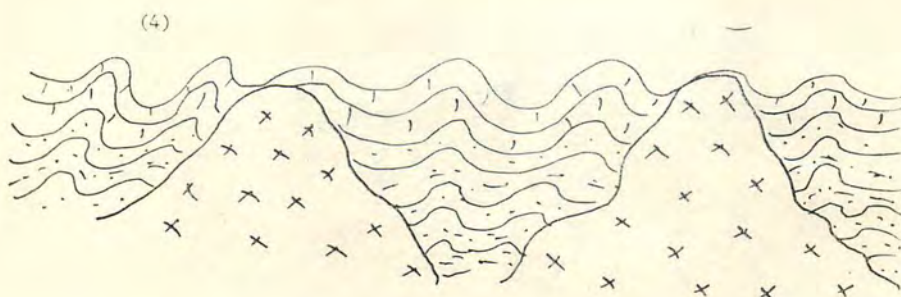
2. This was the beginning of what today is called the Kanchanaburi Series, which is considered to be "Basement" or, for all practical purposes, the bottom of the pile. When the surrounding land ceased to produce sediments, erosion took over. There may have been minor uplift to help remove whatever seas there were and to hasten the erosive forces – as a first sign of things to come.

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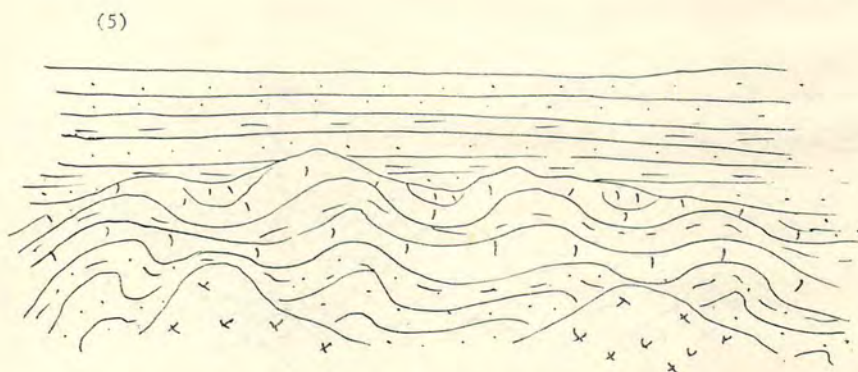


3. Things were not quiet for very long. Shallow seas invaded the area. I suspect that the seas had not gone very far away during the Kanchanaburi uplift. But, nonetheless, the seas brought new sediments. These were warm seas, not deep – not too different than the gulf and the scenery at Pattaya. Marine limestone and shales were deposited on top of the Kanchanaburi beds, and these new rocks we now call the Ratburi Series. There are marine fossils present so we know the age is Permian (250,000,000 years ago). In some places 7500 feet (2300 m) of sediments were deposited.

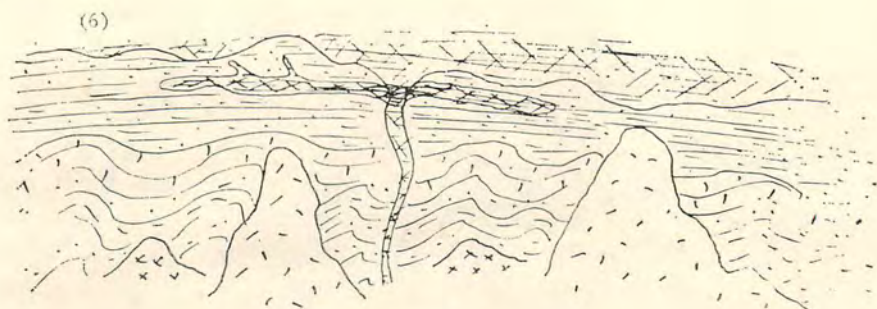




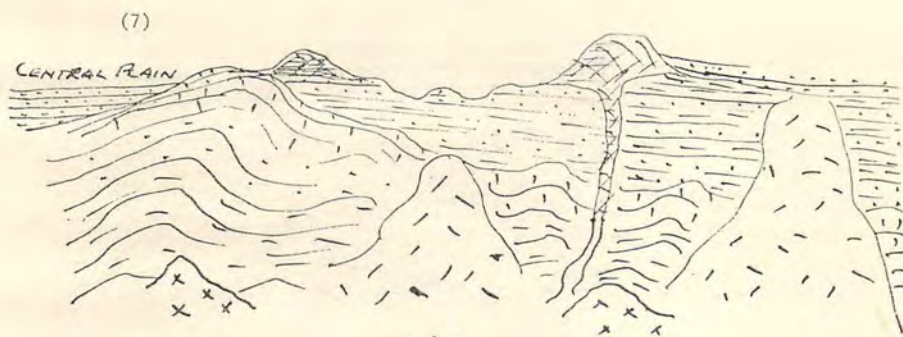
4. The earth's digestive juices began to rumble and things started to happen on the surface. Huge granitic and granodioritic masses intruded the overlying sediments, causing the beds to fold and contort and break. The shales turned to slates and phyllites, the sandstones to quartzite, and the Ratburi limestone to marble, the Saraburi marble, in fact.



5. All became quiet again, and erosion set in to destroy the folded mountains. The climate changed and the plateau area became semi-arid, thus the new sediments formed were characteristic of those being formed in the world's arid lands. There were red sandstones and shales, gypsum and salt deposits. All of these materials came from the folded Kanchanaburi and Ratburi beds, and thus the Korat Series which stretches over the entire NE plateau, was formed—over 15,000 feet (4500 m) were deposited. At the base of this formation large recognizable chunks of the older beds can be seen.



6. Again a long period of erosion took place. It is difficult to say just how many thousands or million of years, but at about the same time the Himalayas started on their way UP. Volcanic activity took over in Khao Yai, Rhyolite flows (light colored basalt) poured out into and onto the existing rock formations and more deep intrusions; this time diorites (similar to granites but darker). Some came nearly to the surface and are exposed not far from Pak Chong,



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7. Erosion set in again and has continued until today. Alluvial deposits from this erosion fills the valley floors, and of course, vast amounts of alluvium fill the area to the west over the Central plain, lapping onto the surrounding mountains.

Most of the rocks visible in the Khao Yai Park area are from the rhyolite flow. To the north the Ratburi limestones and marbles may be found. At the base of the hills to the west some of the Ratburi may be seen in low hills. The Korat series forms the eastern edge of the park.