DEPARTMENT OF GEOLOGICAL ENGINEERING

FACULTY OF ENGINEERING

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Report

On

Regional Geology of Myanmar

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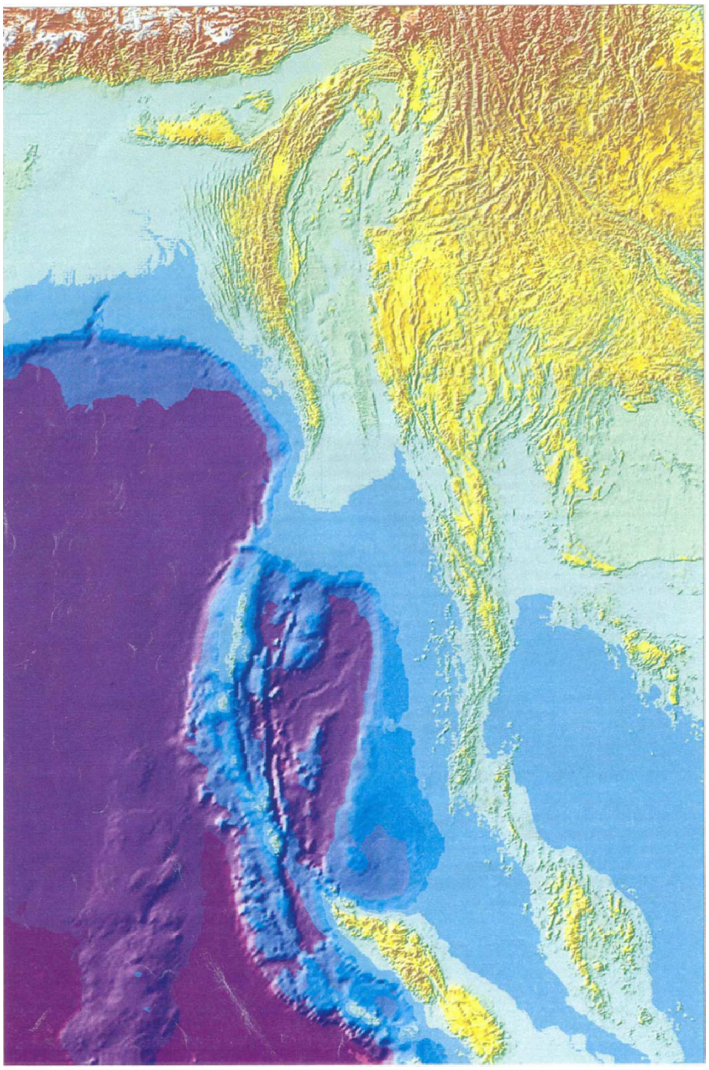
I. Introduction

Myanmar is the largest country in mainland Southeast Asia with a total area of 676578 square kilometer and total population of about 54 millions. Its long coast of about 2000 kilometers covers almost the entire sea coast of Bay of Bengal. The neighboring country is Thailand, Laos, China, India and Bangladesh. The topographic features are various features. The northern part, the eastern part and the western part is mainly highlands part and the central part is flat and the southern part is related with the costal.

Figure(1). The Location map of Southeast Asia

Myanmar can be subdivided into three provinces (Maung Thein, 1993): namely, the Western Fold Belt (WFB) in the west, the Central Lowland (CL) in the middle, and the Eastern Highland (EH) in the east. Geologically, the WFB consists mostly of very thick sequence of the flysch type sedimentary rocks and tectonic mélange of basic and ultrabasic rocks and exotic limestone in the form of ophiolite suite as resulted by the subduction of the Indian Plate underneath the Burma Plate along the Bengal tectonic boundary and also continued collision between these two plates leading to high mountain arc in the west and northwestern parts of Myanmar. Further east, the Eastern Highland, which is a part of the Shan-Thai Block, a large tectonic domain connects to the Pacific tectonic plate, is composed mainly of older rock groups containing plateau limestone and metamorphic complex. The fertile alluvial plain is the Central Lowland, intermittently cropped out by the mountain range and hills running in north south direction and also enhanced by Mount Popa, a dormant volcano in its central part. A large active fault, the Sagaing Fault (Win Swe, 1981) is passing through the eastern margin of this province.

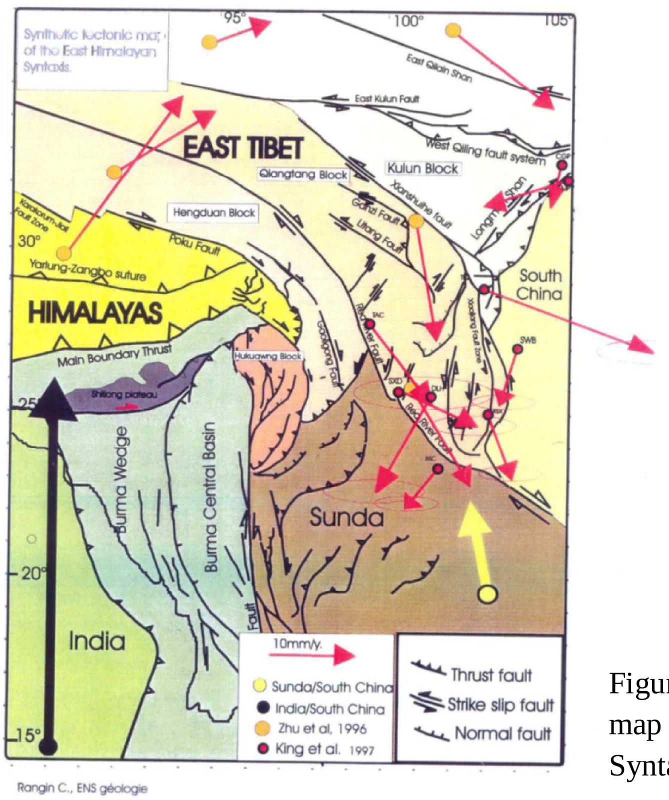


Figure(2). The physiography map of Myanmar

The geological history of Myanmar is summarized in a sequential order in 39 stages. The approach is mainly descriptive and only partly interpretative. The plate-tectonic reconstructions are kept to a bare minimum partly because these are more or less conjectural (particularly for the Precambrian and Paleozoic eras) and partly because the descriptive geological events are considered to be more interesting than the paleo-plate movements and past whereabouts of the Myanmar region. Four stages in the paleogeographic evolution are shown in a diagram. A graphic summary of the main geological events and a simplified geological map of Myanmar are also appended.

II. Tectonic Setting of Myanmar

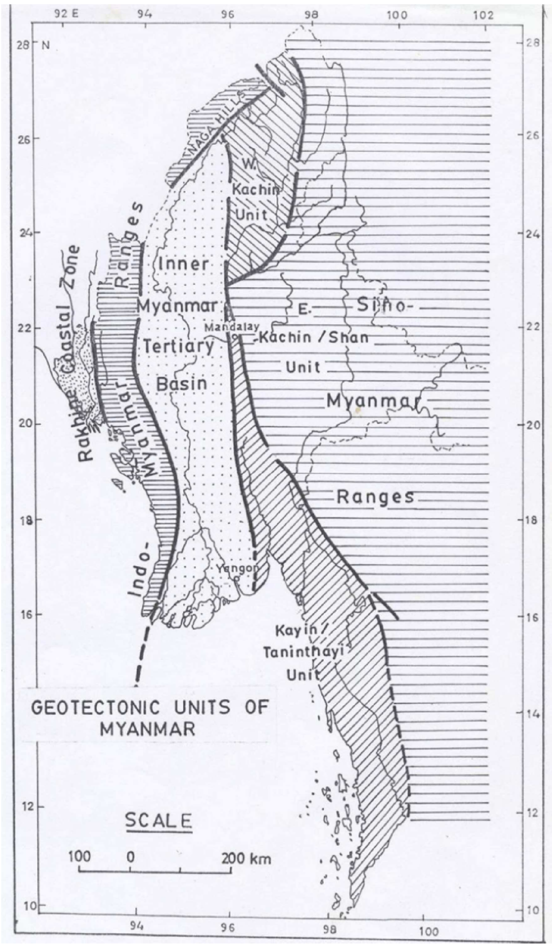
Myanmar region have originated from two main causes: (1) the subduction (with collision only in the north) of the northward moving India Plate underneath the Burma Plate at an average rate of 4 to 6 cm/yr along the Andaman Megathrust Zone; (2) the northward movement of the Burma Plate from the spreading centre in the Andaman Sea at an average rate of 2.5 to 3 cm/yr. Very large over-thrusts along the Western Fold Belt have resulted from the former movement, and the Sagaing and related faults from the latter movement. Intermittent jerks along these major active faults have caused the majority of earthquakes in Myanmar. These seismotectonics processes are still going on. The earthquakes generated by sea-floor spreading in the Andaman Sea, however, are mostly small to moderate and shallow-focus.



Figure(3). Synthetic tectonic map of the East Himalayan Syntax

Geomorphologically as well as tectonically Myanmar can be subdivided into four major tectonic provinces which are north-south trending linear belts, these are from east to west (1)

Shan-Tanintharyi Block (2) Central Cenozoic Belt (3) Western Fold Belt (4) Rakhine Coastal Belt. Myanmar is located at the very active tectonic area which includes the Burma oblique subduction, the Sagaing strike slip fault system and the southern opening region. Mitchell (1973, 1977) proposed a plate tectonic model in Myanmar. The model proposed here is inspired from Mitchell's model with a slight difference the dip of the subduction zone does not change. Instead, the trench moves westward during the Cenozoic and the Arakan- Yoma- Naga Suture Zone is created as a result of collision between the Indian plate and the China plate.

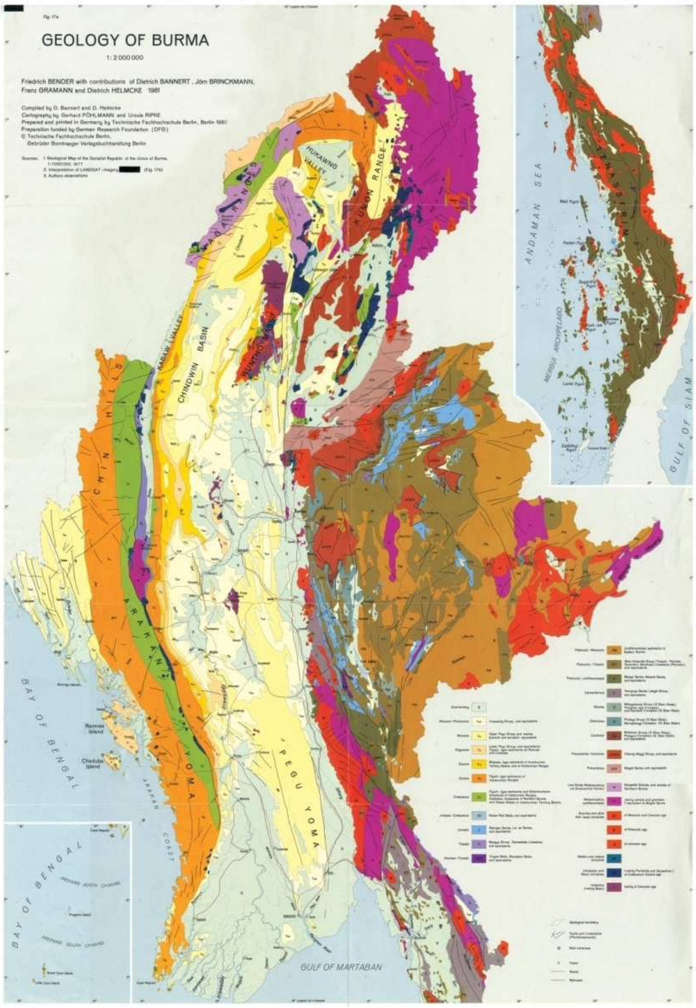


Figure(4). Major Geotectonic units of Myanmar

The late Mesozoic, tholeiitic volcanism invades a thin continental crust at the site of Monywa, Contemporaneous calc-alkaline volcanism. Further east and some 150 km above the subduction zone invades a thicker continental crust and is responsible for the andesitic and rhyolitic tuffs and plugs at the site of the actual Shan Scarp. During the Cenozoic, the subduction and trench retreat to the west.

III. Regional Geological features of Myanmar

Myanmar consists of tectono-stratigraphic terranes which now form the continental mainland of the South-East Asia. Myanmar can be subdivided into six north-south trending tectonic domains: from west to east (a) the Arakan (Rakhine) Costal Strip as an ensimatic fore deep; (b) the Indo- Buraman Ranges as an occur arc or core arc; (c) the Western Inner-Burma Tertiary Basin as an inter-arc basin, (d) the Central Volcanic Belt (central volcanic line) as an inner magmatic-volcanic arc; (e) the Eastern Inner-Burma Tertiary Basin as back-arc basin and (f) The Sino-Burma Ranges or Shan-Tenasserim Massif as an ensialic continental region (Khin Zaw, 1992). The Sagaing Transform Fault occurs as a tectonically significant boundary between the Eastern-Burma Basin and the continental, ensialic Sino-Burma Ranges.



Figure(5). Regional Geological map of Myanmar (after Bender, 1981)

Sequence of Major Events

During the Precambrian and Paleozoic eras, Proto-Myanmar region was a part of Sinoburmalaya that probably was a fragment of northern Gondwanaland in Southern Hemisphere. This linear block was roughly aligned NW-SE.

Late Precambrian

1. Existence of a crystalline basement in northeastern Proto-Myanmar (Eastern Kachin Metamorphics) that extended northwards into Proto-Yunan, and probably southeastwards into the Mogok Gneiss.
2. Later, deposition of very thick Chaung Magyi sediments under deep sea conditions in Proto-Shan region.
3. Orogeny at the end of Precambian causing fairly intense deformation, low-grade regional metamorphism, and uplift; thus, a part of northeastern Proto-Myanmar first became land.

Early Paleozoic

The Paleo-Tethys oceanic plate probably moved from NE to SW and subducted below Sinoburmalaya. Shallow marine sediments were deposited in an apparently passive continental margin of Sinoburmalaya.

4. Deposition of Ngwetaung and Pangyun sandstones and Molohein sandstones in the northern and southern parts of Proto-Shan region, respectively, on a stable sheft during Late Cambrian: eruption of the Bawdwin volcanics with associated volcanogenic massive sulphide (VMS) lead-zinc-silver deposit in the same period.
5. Deposition of thick Ordovician limestones and siltstones under littoral and shelf conditions in Proto-Shan region, together with stratabound carbonate-hosted lead-zinc deposits (e.g., at Bawzaing) and barite deposit (e.g., at Ani-sakan and Kyauktup)
6. Continuous depositional of Silurian phacoidal limestones and clastics, locally with some tuff and ash beds in southern Proto-Shan region; deposition of Mergui sediments probably began during Silurian in Proto-Tanintharyi region.

Devonian

7. Continuous sedimentation from Silurian to Devonian in some parts of Proto-Shan region as black limestone, black shale and reefal limestone were deposited at thin units of limited distribution under lagoonal and restricted marine conditions.
8. Deposition of a limestone unit (later dolomitized into Maymyo Dolomite) began in Proto-Shan region, especially in the northern part. That deposition continued into Carboniferous.
9. Deposition of Mergui sediments continued in Proto-Tanintharyi region.

Early Carboniferous

Separation of Sinoburmalaya from Gondwanaland, and its initial movement northeastwards in the Paleo-Tethys in Carboniferous times.

10. Continued deposition of Mergui sediments, locally with tuff and agglomerate beds, under deep-sea conditions in Proto-Tanintharyi-Mon region. (The depositional site extended northwestwards into the western marginal part of southern Proto-Shan region where Lebyin clastics were deposited)
11. Orogeny at the end of Early Carboniferous resulting in the deformation and low-grade regional metamorphism of Mergui Group, and possibly the intrusion of some granite plutons in Proto-Shan region _e.g., Taung-baing Granite). The fairly widespread small-scale antimony mineralization in the Lebyin and Taungnyo clastics (e.g., at Lebyin and Natsan mines) was possibly related to this igneous activity.

Late Carboniferous-Middle Triassic

12. Deposition of a thick limestone sequence (Plateau Limestone, Moulmein Limestone, and Kamawkala Limestone), later partially dolomitized, in a wide warm shallow sea that covered most of Proto-Shan-Kayah-Kayin region. (This wide carbonate platform extended into Proto-Yunnan in the northwest, and into Proto-Western Thailand in the east). A thin clastic wedge was also deposited in some parts of Proto-Mon-Kayah region during Late Permian.
13. Earth movements, intrusion of granited in eastern Proto-Shan region, and initial emergence of Proto-Shan-Tanintharyi region at the end of Middle Triassic.

Middle-Late Triassic

Continued northeastward movement of Sinoburmalaya in the Neo-Tethys. Southwest of the emerging land lay a deep sea in which flysch beds were laid down. The northeastward-moving ocean floor then began to subduct below the emerging Proto-Shan-Tanintharyi landmass.

14. Depositional of a thick deep-sea flysch unit containing fossils of *Halobia* and *Daonella* and locally ophiolites (Thanbaya Formation) along the northeastern margin of Proto-Rakhine-Chin region.
15. Concurrently, depositional of thin units of evaporates (lower) and shales and bone beds (upper) in a few small enclosed basins in northern Proto-Shan region which partially had become a landmass.

Jurassic

16. Flysch deposition most probably continued in Proto-Rakhine-Chin region.
17. Concurrently, there was deposition of shallow-sea and deltaic sediments in a few down-faulted intermontane basins and shallow seas within and along the western part of the still rising Proto-Shan Plateau—turbidites with coal seams in Proto-Kalaw Basin; sandstones, shales and limestone in Proto-Kinda-Kyaukse area; limestone and red beds in Proto-Lashio Basin.
18. Subduction related large-scale intrusion of granitoid plutons and batholiths (locally with volcanics) with associated tin-tungsten mineralization along Proto-Tanintharyi and the western marginal zone of Proto-Shan Plateau (e.g., at Hermyingyi, Mawchi, Padatchaung) during Late Jurassic.
19. Late Jurassic orogeny causing tight folding of the incompetent Jurassic beds; limited metamorphism along the western marginal zone of Proto-Shan Plateau.

Cretaceous

During Early Cretaceous, the northeast-moving Sinoburmalaya collided and combined with Indochina Block along Nan Suture to form Proto-Southeast Asian Peninsula, the southeastern part of Eurasian Plate. At about that time, Indian Plate started to move northeastwards and there was more subduction of the ocean floor beneath Sinoburmalaya.

20. Continued deposition of thick flysch, with *Globotruncana*-bearing limestone locally in the upper part, in the subduction trench; and there was deposition of a thin unit of *Orbitolina*-bearing limestone in some places of the shallow sea (of the fore-arc basin) that lay between the said subduction trench and Proto-Shan Plateau.
21. In contrast, a unit of red fanglomerates and siltstones (Kalaw Red Beds) was laid down in an oxidizing continental environment in the Kalaw Basin in the western part of southern Proto-Shan Plateau.
22. Intrusion of more granitoid plutons, also with associated tin-tungsten mineralization, again along Proto-Tanintharyi and the western marginal zone of Proto-Shan Plateau during Late Cretaceous.
23. In contrast, during Late Cretaceous-Early Paleocene, intrusion of small and medium-sized ultramafic bodies along the eastern flank of Proto-Rakhine-Naga region (Serpentinite Line) and in Proto-Kachin region, with associated nickel-chromium mineralization in northern Proto-Chin Hills (notably at Mwe-taung) and jadeite mineralization in western Proto-Khanti and Proto-Tawmaw areas.
24. Beginning of igneous activity in the northern part of Central Igneous Line (i.e., in Proto-Wuntho area) at the close of Cretaceous.
25. Epirogenic movements and final uplift of Proto-Shan-Tanintharyi region to become a high landmass at the end of Cretaceous.

Paleocene-Eocene

26. Continued deposition of very thick flysch, locally with radiolarite and ophiolites, in Proto-Rakhine-Chin trench that had been receding southwestwards as indicated by the gradual younging of the flysch sequence in the same direction.
27. Concurrently, thick upper Paleocene-Eocene molassic sediments were laid down as a lateral tecto-facies in Proto-Chindwin and Proto-Minbu basins which lay in the intervening region between the said trench and Proto-Shan Plateau. In Chindwin Basin, the Eocene sediments were deposited under fluvial and deltaic conditions (thus with coal seams, e.g., in Kalewa area) by Proto-Ayeyarwady and Proto-Chindwin rivers. In Minbu Basin, very thick Eocene sequence was laid down in delta and shallow sea in the north,

and in a deeper sea in the south. Earliest anthropoid primates (*Amphipithecus* and *Pondaungia*) lived along some river valleys in Proto-Pondaung area during Late Eocene.

28. Intrusion of some more granitoids along the western margin of Eastern Highlands in Early Eocene.
29. Collision of NNE- moving Indian Plate and the southern part of Eurasian Plate in Late Eocene, resulting in Himalayan orogeny and initial clockwise rotational movement westwards of Proto-Southeast Asian Peninsula. That orogeny caused the folding, large-scale overthrusting and rise of the Western Ranges, and uplift of the Central Belt and formation of pre-Oligocene unconformity.

Oligocene

30. Further development of the Chindwin and Minbu basins in the subsiding graben that lay between two risen landmass during Early Oligocene, and the deposition of Oligocene sediments (Lower Pegu Group) mainly in Minbu Basin where the facies pattern was similar to that of the Eocene sequence.
31. During Late Oligocene, middle phase of Himalayan orogeny caused fairly intense metamorphism along a narrow belt (Mogok Belt) in which rubies and sapphires of Mogok Stone Tract were formed; uplift of the Central Belt and formation of pre-Miocene unconformity.

Miocene

Further rotational westward movement of southeast Asian Peninsula, and by Early Miocene it nearly reached its present position.

32. Subduction-related volcanism along Central Igneous Line during Miocene formed a volcanic arc that became a substantial barrier separating the graben into two troughs in which thick Miocene sediments (Upper Pegu Group) were laid down separately as two fairly different sequences. Concurrently, molassic sediments were also being laid down in the northern part of the Rakhine Coastal Belt—the southern extension of Assan Basin in northeast India.

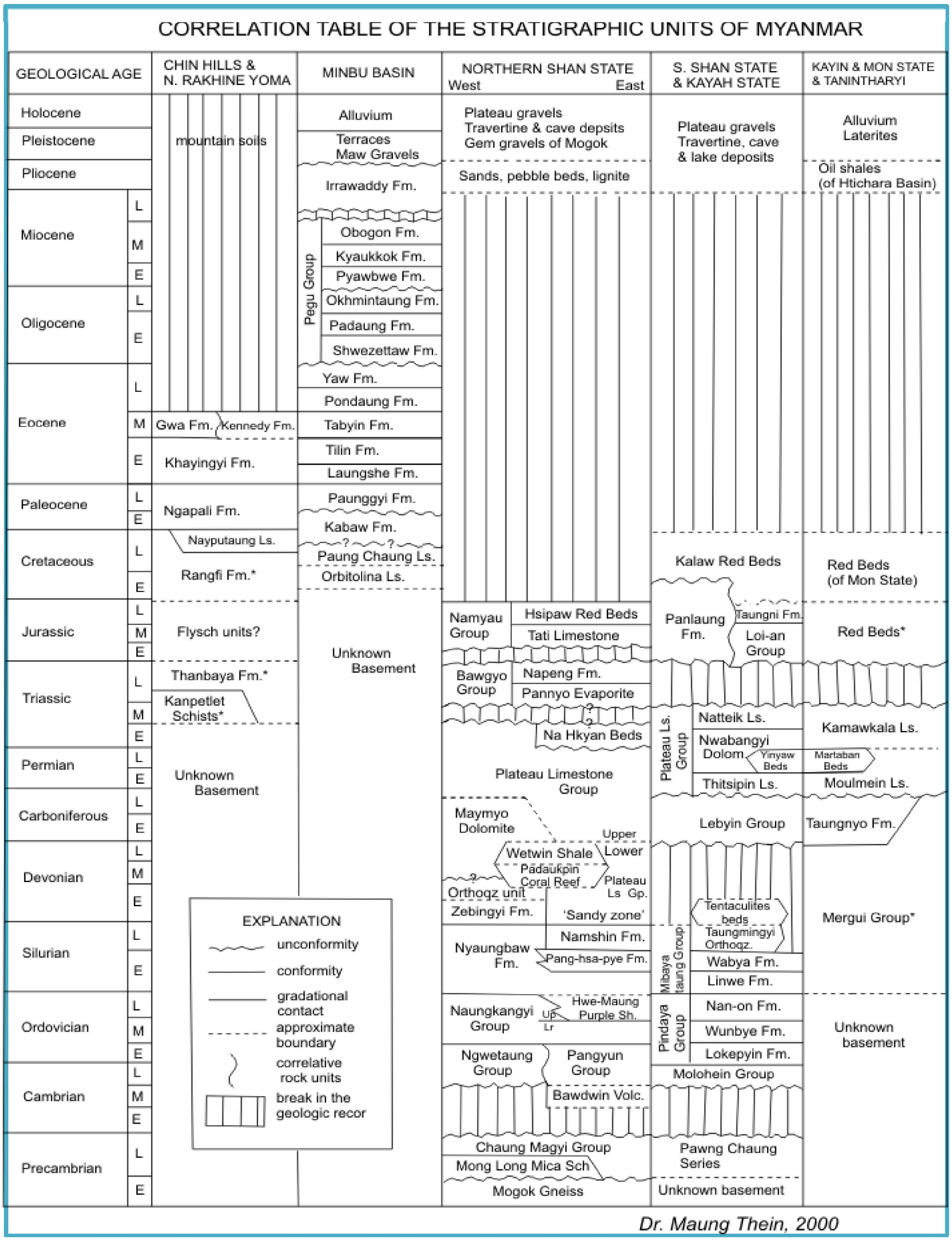
33. Northward movement of the oceanic crust from a spreading center in the Andaman Sea since Middle Miocene, resulting in the development of “Burma Plate”—a microplate bounded on the east by the Sagaing Fault and on the west by the Andaman Thrust.
34. Late phase of Himalayan orogeny during Late Miocene, resulting in the folding and uplift of Central Belt, particularly the Bago Yomas; oil and natural gas migrated and accumulated in the folded Eocene and Pegu sandstones along the eastern side of Minbu Basin (e.g., at Chauk, Mann, Letpando); intrusion of younger granites (mainly microgranite, e.g., Kabaing Granite) along the Mogok Belt.

Pliocene

35. Continued northward movement of Burma Plate as Irrawaddy sandstones with fairly abundant fossil wood and vertebrate remains were laid down under fluvial conditions along the Ayeyarwady and Chindwin river valleys as the low-lying Central Belt was finally filled up. The present outline of Myanmar first took shape.
36. More volcanism along Central Igneous Line; porphyry copper mineralization in the dacites and andesites of the Monywa area.

Quaternary

37. Deposition of Uyu boulder conglomerates, plateau gravels, and river terraces along big river valleys in northern Central Belt during Pleistocene.
38. Renewed volcanism (mainly andesites and basalts) along Central Igneous Line, e.g., at Mt. Popa and Twindaung, during Pleistocene and Early Holocene.
39. Depositions of newer alluvium and denudation have been going on side by side since the beginning of Holocene to form the present the present landscape of Myanmar.



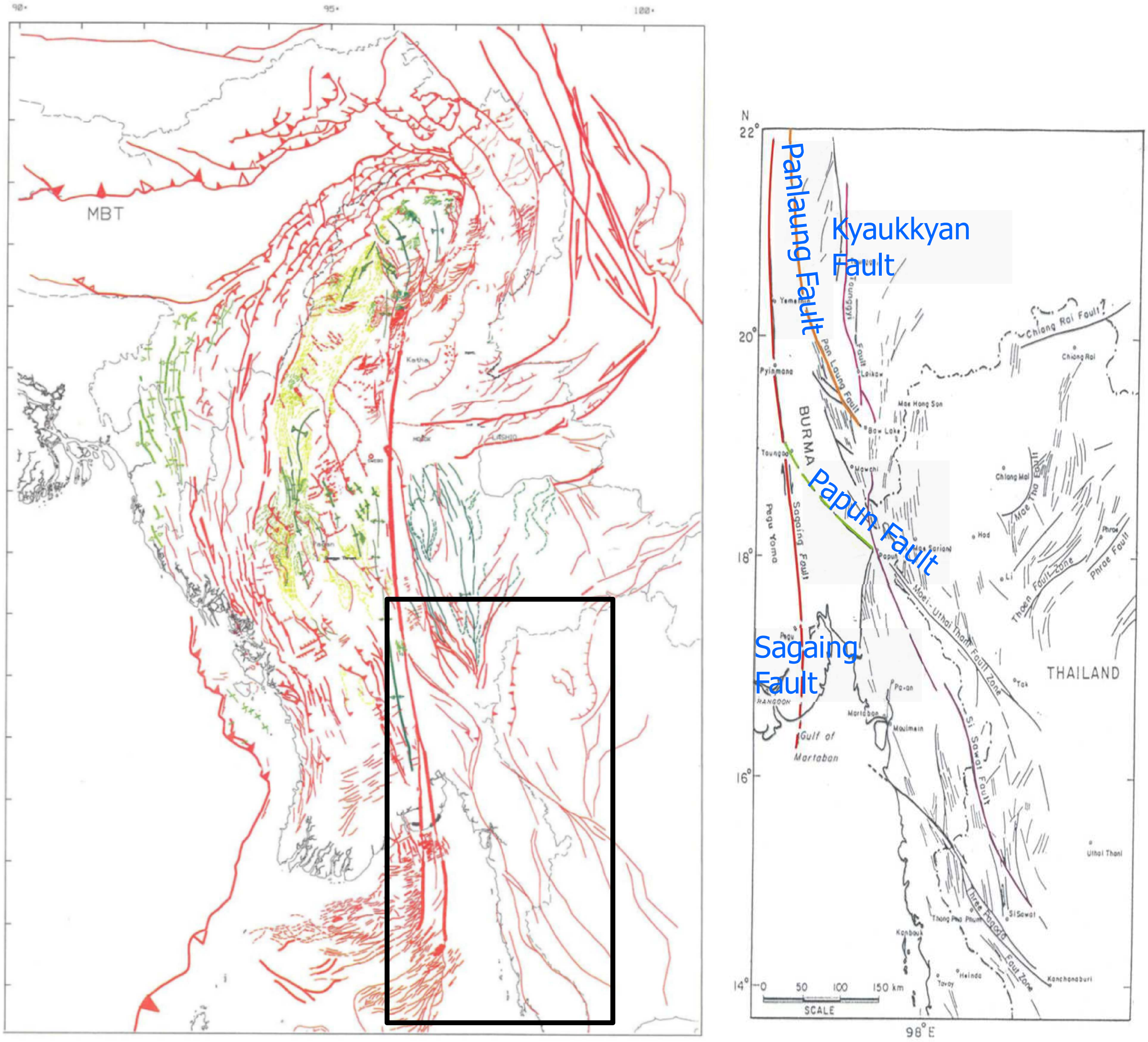
Table(1) Correlation table of the stratigraphic units of Myanmar

IV. Structural Geology of Myanmar

The structural geology of Myanmar is not complex. The one of the major active is Sagaing Fault. It controls the structural geology of Myanmar.

The Sagaing fault is a continental transform fault between the India and Sunda plates that connects spreading centers in the Andaman Sea and the continental convergence zone along the Himalayan front. Several *M*>7 earthquakes occurred along the fault in the last century, and Global Positioning System campaigns revealed a right-lateral slip rate of 18 mm/yr, about half of the total India–Sunda displacement rate of 35 mm/yr. It passes through just east of Bago and enter western gulf of Martaban. The combined slip on the Sagaing and Sumatra-W Andaman faults has absorbed the full opening of Andaman Sea The Sagaing fault had been dextrally moving since 11 Ma at a average rate of 18.5 mm/yr (after Myint Thein et. al, January, 1991). The cities such as Bago, Swa, Phyu, Pyinmana were severely affected by earthquakes generated from the movement of Sagaing fault. The fault zone is quite wide (about 20 km) south of Bago, and rather narrow (< 2km) in many other areas, and the locking depth is estimated to be about 15 km.

Kyaukkyan fault is one of the prominent seismotectonic feature (Lat. 22˚ 18´N – Long. 96˚ 44´E). (after Win Swe, 1980). The large earthquake of 23rd May, 1912 (8.0 RM) with many foreshocks and aftershocks, seems to be associated with that fault. It runs nearly north-south direction. Pan Laung fault run into the Shan Scarp accompanied by a zone of NNW – SSE subparallel faults towards the north. This zone has been reactivated due to Late Mesozoic and Cenozoic block movements (after Bender, 1983). Small lineament, branching from Pan Laung fault in NW – SE direction at about Lat. 20˚ N is displayed as major active fault (after Le Dain et. al.,). The name Papun Fault was first described by Le Dain, et. Al., 1984 and it extends for about 400 km in NW– SE direction passing Papun City in Myanmar. The different sense of lateral motion pattern along Papun Fault controls the crustal thickening, relaxation and thinning of Shan Plateau region (after Win Naing, 2006). Papun fault has sinistral sense of motion between 33 Ma to 30 Ma and dextral sense of motion about 23 Ma. Younger Sagaing Fault cut across this fault at Lat. 19.3˚N - Long. 96.3 E˚ (after Win Naing, 2006).



Figure(6). Structural map of Myanmar

V. Mineral Belts of Myanmar

In 1924, there are six provinces or region was made by Brown. These are; (a) the Shan-Yunnan region with Ag-galena, sphalerite, chalcopyrite, pyrite and stibnite; (b) the Mogok gneiss region with the celegrate gemstones; (c) the Tenasserim region with cassiterite and wolframite, and a smaller amount of molybdenite, bismithinite, chalcopyrite, pyrite, arsenopyrite, sphalerite and stibnite; (d) the central belt with hydrocarbons coal and amber; (e) the Mingin group with gold-telluride and chalcopyrite, pyrite, galena. Franklinite and altaite; (f) the Arakan- Naga region with chromite, native copper, chalcocite, chrysotile, steatite and magnesite.

In 1970, Professor Ba Than Haq, in his presidential address to the Burmese Research Congress defined seven metallogenic provinces; (a) the chromite, nickel and platinum province along the Arakan- Chin belt, the Naga Hills and north of Myitkyina; (b) the tin and tungsten provinces in Tenasserim area, Karen state, south-western Shan State and the northernmost part of the northern Shan State (c) the iron and manganese provinces near Myitkyina and small regions in the southern Shan State and near Moulmein, Tavoy and Mergui and along the Tenasserim archipelago; (d) the copper provinces east of Mandalay- Kyaukse, east of Yamethin, south-west of Moulmein and east of Mergui; (e) Tertiary copper provinces with Monywa and two other regions, south of Myitkyina; (f) the lead- zinc- silver province from northernmost Myanmar to the south along the Chinese border bending to the west at the latitude of Lashio towards Mandalay and thence south-south- east to the border with Thailand and (g) the antimony province cobbering most of the central and eastern Shan State and a narrow corridor from Lebyin south to the Thai border passing through Tat-Thon and Moulmein. More recent metallogenic studies, however, have found that Ba Than Haq's classification (1972) is rather complex.

In 1948, Scmmerlatte delineated three metallogenic provinces base on the genitival aspects of the metallic ores and in assigning te occurrences to certain geological units. They are (a) the Arakan- Chin chromium-nickel-platinum-copper-iron province to the west essentially controlled by ultramafic rocks similar to the Arakan-Naga region (b) the north –eastern Myanmar chromium-copper-iron-lead-manganese-zinc-gold-molybdenum province essentially controlled by ultramafic rock exposures by granite exposures and Precambrian exposures (c) the Shan-Tenasserm-tin-wolfram-fluorite-barite-copper-antimony-iron-lead-manganese-zinc province, essentially controlled by granitic exposures. Ordovician limestone exposure, Upper Paleozoic carbonate, Upper Paleozoic clastics, Precambrian, Paleozoic and Jurassic clastics and lateritization.

(1)The Arakan-Chin metallogenic province

This province consist spatially with the Indo-Burma Ranges which branch southwards from the eastern Himalaya and are formed of early Tertiary flysch-like sediments with allicochthons of Cretaceous and Triassic rocks. The ranges developed in an Andean-type plate margin and are characterized by the development of ophiolite belts and imbrecate thrust zones. The ranges are an elongate folded slightly belt of mostly flysch sediments enclosing small ultramafic bodies and basalt with some metamorphic rocks. It is the main features of western Myanmar to the south the ranges disappear in the Bay of Bengal but remerge in the Andaman and Nicobar Islands.

Chromite and nickel laterite are the main mineral resources in the Indo-Burma Ranges. Chromite is generally found in pods and in larger pockets that is very irregularly distributed within the ultramafic rocks of the narrow serpentine or ophiolite belt. The ophiolite belt extends northward as far as the Jade mines of Tawmaw passing through Assam. Near Mwetaung in the chin hills, eluvial deposit of chromite occur on the slope of serpentinized hills; the same eluvial chromite boulders are found in the jadeite working near Tawmaw, Myitkyina district.

The nickel laterite has been reported from the Taguang Taung some 175 km to the north of Mandalay. It is said to contain 40 million tonnes of ore averaging 2.01 per cent of Ni. The deposit was found by a German- Myanmar joint venture.

(2)The north-eastern metallogenic province

Ultramafic mafic granite and Precambrian rocks dominate the geology of north-eastern Myanmar. Typically igneous ore assemblages are reported from this remote area. It is also a geotectonically important region where the Indus-Tsangpo Suture Zone and the Arakan-Yoma-Naga ophiolite arc-trench assemblage are truncated by an ESE fault.

The metallogenic province hosts chromium- copper and iron-lead- manganese –zinc-gold-molybdenum mineralization essentially controlled by ultramafic rock exposures by granite exposures and Precambrian exposures.

Since ultrabasic rocks occur at the eastern edge of the Arakan Yoma in the Chin-Naga Ranges and north of Myitkyina over a total N-S distance of more than 1000km; a metal assemblage containing mainly Cr,Ni,Cu,Mg and Pt is just as likely to occur as in north-eastern Myanmar where, apart from ultramafic (Cr, Ni, Cu, Fe, Mn, Mg) acid intrusive and extrusive (Pb, Zn, Ag, Mo, Cu, Au) and Precambrian rocks with polymetallic mineralization are known.

(3) The Shan-Tenasserim metallogenic province

The Shan-Tenasserim province extends into Thailand and into the Yunan Province of China to the north its extension is limited by the ENE set of faults, north of Lashio, and to the west by the N-S trending Shan Boundary Fault. It is essentially a polymetallic province and subdivisions, if any, cannot be drawn with the information presently available.

This province is at least 300km wide and 1500 km long. It is made up of a succession of clastic and carbonates series, Paleozoic to Mesozoic in age, lying on a Precambrian basement. The Ordovician carbonate belt with strata-bound or structurally controlled Pb-Zn-Ag mineralization can be traced from Kanchanaburi (Thailand) through the Shan State.

Granitic bodies were intruded into these sedimentary sequences at several times. The sedimentary rocks were highly folded, overturned and metamorphosed especially to the west. The sedimentation of the Lower Paleozoic carbonate series is locally associated with contemporary volcanism (that is Bawdwin). This is the Pb-Zn-Ag (plus Cu, Co, Ni in the case of Paleozoic volcanism) province. This province hosts tin-wolframite-fluorite- barite-copper-antimony-iron-lead-manganese-zinc mineralization, essentially controlled by granitic exposures (for Sn-W), Ordovician limestone exposures (for Pb,Ba, Zn), Upper Paleozoic carbonate (for F-Sb), Upper Paleozoic clastics (for Sn-W-Sb) Precambrian, Paleozoic and Jurassic clastics (for Cu-Pb) and laterization (for Fe-Mn).

VI. Conclusion

As in many other parts of the world, the Myanmar region was formed by the accretion of differently formed terrains at different geologic times. In the Myanmar case, three major accreted terrains were involved. These now occurs as three main tectonic provinces, namely, Shan-Tanintharyi Block, Western Fold Belt, and Central Cenozoic Belt.

The first province was originally a part of Sinoburmalaya Block which had been situated at northern Gondwanaland and which stated to move northeastwards in Carboniferous times. It collided and combined with the Indochina Block to form Proto-Southeast Asian Peninsula. While moving so,deep-sea Mesozoic flysch were being laid down at southwest of the drifting Sinoburmalaya. This part later became the second province after being subjected to Himalayan orogeny that resulted from the collision between Indian Plate and Eurasia Plate at the close of Eocene. That collision also caused clockwise rotational westward movement of Southeast Asian Peninsula. Then, in Middle Miocene the oceanic crust moved northwards from a spreading centre in the Andaman Sea. Thus, the third province was accreted last to form the Myanmar region.