

5 cm

SUMMARY OF GEOLOGICAL HISTORY OF TASMANIA (Emyr Williams)

ERA	PERIOD	EPOCH	ROCK UNITS (SOME FOSSIL GROUPS)	IGNEOUS ACTIVITY	TECTONIC ACTIVITY	NOTES			
CAINOZOIC	QUATERNARY	HOLOCENE 10 000 years	Alluvium, terrace deposits, dunes, sand ridges, spits, peat, scree.		Local movement e.g. Lake Edgar Fault.	Development of present day coast. Maximum rise in sea level + 3m.			
		PLEISTOCENE	Till, varves, colluvium, stratified scree, sand sheet deposits (remains associated with man). Fluvial and marine deposits. Tillite, glacio-lacustrine deposits, glacial erratics.			Valley and cirque glaciation at max. ~20 000 years before present (BP). Mild climatic conditions (approx. 55 000 to 25 000 years BP; max. sea level +20 m to +22m). Extensive island glaciation. Erosion level. Marine regression. Beginning of Tasmanian marine transgression (~25 MY).			
MESOZOIC	TERTIARY	1.8 my	Shallow marine and aeolian limestone with sandstone from Wynyard (24m), Cape Grim, King Is., Furneaux Islands. (cephalopods, echinoderms, gastropods, Non-bryozoans, foraminifera) Non-marine clay, sand, gravel, boulder beds, minor lignite, and laterite (e.g. Tamar - 275m; angiosperms - flowering plants, pelecypods), basic volcanic horizons (e.g. Tamar - 180m).	Basalt (15 to 30 MY; main activity about 22 MY), eruption about centres located on fault lines.	Beginning of main sea floor spreading (-55 MY) between Australia and Antarctica, continues to present day. Subsidence of Bass Basin and relative isolation of Tasmania from Australia.	Tropical to sub-tropical climate. Freshwater lake deposition with thickest accumulations in troughs. Low angle unconformity.			
			CRETACEOUS	141 my	Appinite at Cape Portland (96 MY) - porphyrite intrusions, lamprophyre dykes, andesite lava. Syenite and sandine porphyry sheets & dykes at West Coast (137 MY)	Extensive fracturing associated with dolerite intrusions.	Development of depositional troughs (Tamar, Macquarie, Derwent Troughs).		
					JURASSIC	195 my	Dolerite (172 MY), minor granophyre intrusions, as thick (450m) interconnecting sills, dykes.	Erosion Level	Shallow fresh-water environment with mudcracks and large-scale current-bedding common in deposits. Carbonaceous material mixed with inorganic debris deposited in small lakes which varied position.
PALAEOZOIC	PERMIAN	230 my	Parameener Super-Group. Upper Parameener Super-Group. Upper Fresh-water Sequence (ferns, plants, reptiles, amphibians, fish). Sandstone with grains of quartz, feldspar, mica, volcanic rocks, coal, shale (200m). Quartz sandstone, shale, mudstone (400m).			Disconformity E of line from Ida Bay to Poatina - conglomerate with boulders of Permian rocks Establishment of non-marine deposition.			
			Carbonaceous sequence (e.g. Cygnet Coal Measures - 40m) of sandstone, carbonaceous siltstone, mudstone, coal. Lower Parameener Super-Group. Upper Marine Sequence (Hobart - 360m; brachiopods, bryozoans, stenoporiids, pelecypods, gastropods). Pronounced facies variation with calcareous siltstone, limestone, quartz siltstone, mudstone, minor arkosic and glauconitic sandstone. Lower Fresh-water Sequence (e.g. Mersey Coal Measures - 30m; plants) Sandstone, coal. Lower Marine Sequence (Hobart - 300m; foraminifera, pelecypods, gastropods, spores, brachiopods, stenoporiids, crinoids). Pronounced facies variation with siltstone, mudstone, sandstone, minor limestone, conglomerate, oil shale. Basal tillite (e.g. Wynyard Tillite - 600m; plants, insects) - glaciolacustrine deposits, rhythmic clays, tillite.			Abundant dropstones. Deepening of marine basin. Paraconformity at some localities (e.g. Cygnet). Onset of non-marine deposition in NW and N later spreading E and NE; absent in S Tasmania. Abundant dropstones from ice bergs; deeper part of depositional basin in S Tasmania.			
			CARBONIFEROUS	345 my			Lateral movement along Tamar Fracture System.	Tillite absent E of Hobart meridian. Ice centre in NW Tasmania after prolonged erosion. Angular unconformity.	
					LATE	Eugenana Beds (Spores) - cave deposits including carbonaceous siltstone.	WESTERN TASMANIA Granite intrusions (365 - 335 MY) (Ag, Pb, Zn - Zeehan; W - King Is.; Sn - Mt Bischoff, Cleveland, Renison).	W and NE Tasmania brought into juxtaposition.	NORTH - EASTERN TASMANIA Granitic intrusions (373 - 380 MY) truncating fold structure of country rocks. (W - Rossarden; Sn - Storeys Ck; Au - NE Tasmania). Orogeny correlated with Tabberabberan of E. Aust. Folds of NW trend.
			DEVONIAN	395 my	EARLY	Eldon Group (Tiger Range Group, Spero Bay Group) and correlates (1800 m; trilobites, brachiopods, corals, gastropods, graptolites) - Shallow marine quartz sandstone, mudstone, minor limestone.		Orogeny correlated with Tabberabberan of E. Aust. Late phase - folds of Deloraine/Railton trend; Tyennan Block yielding along fold zone of Zeehan/Gormanston trend. Early phase - Cambrian geanticlines behaved as competent blocks between which developed folds of West Coast Range / Valentine Peak trend, and Loongana / Wilmot trend.	
					MIDDLE	JURASSIC	435 my	Uninterrupted subsidence of Cambrian trough and adjacent areas.	Conformable litho-stratigraphic boundary. Deposition in warm shallow inundating seas spreading from sites of Camb. geanticlines.
			CAMBRIAN	570 my	MIDDLE AND LATE	June Group and approximate equivalents. Gordon limestone Sub-Group and correlates (2000 m; corals, gastropods, algae, brachiopods, pelecypods, echinoderms) - dominantly shallow-marine limestone beds of various size grades; oolitic, pisolitic and oncolitic types. Denison Sub-Group and correlates (2500 m; trilobites, brachiopods, graptolites, worm casts) including: - Owen Conglomerate correlates (1500 m) - shallow marine and terrestrial quartz - sandstone and conglomerate. Local Basal Beds (800m West Coast Range) turbidite quartz-wacke and mudstone; shallow-water volcanoclastic sequence. West and North-West Tasmania Troughs Dundas Group and correlates (3200 m; agnostid trilobites, dendroids) - mudstone, turbidite lithicwacke chert conglomerate, volcanic rocks including lava. Adamsfield Trough Trial Ridge Beds (500 m; agnostid trilobites) - siltstone, turbidite quartz-wacke, siliceous conglomerate.	Acid - intermediate volcanic rocks include lavas - rhyolite, dacite, minor basalt. Murchison, Elliot Bay, Dove & Darwin granites Basic intrusions - (Ni sulphide at Cuni).	Local deformation associated with emergence of Tyennan Geanticline.	Usually angular unconformity; transitional boundary within Dundas trough.
					EARLY	Crimson Creek Formation and correlates (2500 m; acritarchs) - mudstone, minor turbidite lithic-wacke, tuff, lava, chert. Basal beds (to 800 m; acritarchs, stromatolites) of shallow-water quartz - sandstone, dolomite.	Acid - intermediate volcanic rocks include lava - rhyolite, dacite. Basic lavas - spilite.	Dismembered ophiolite tectonically emplaced at Serpentine Hill, Bald Hill (Os Ir, magnetite). Emplacement Adamsfield ultramafic body (Os Ir).	Erosional level at Serpentine Hill; inferred angular unconformity at Adamsfield.
			PRECAMBRIAN PROTEROZOIC	850 my	EOCAMBRIAN	Dominantly comparatively unmetamorphosed sequences (5000 m; microfossil acritarchs, worm casts) Rocky Cape Group of shallow-water quartz - sandstone, siltstone, mudstone. Burnie Formation of turbidite quartz-wacke, siltstone, mudstone.	King Island West Coast granite. Coeoe dolerite dykes & sills (> 720 MY). Minor basic lava - spilite	Penguin Orogeny - folding; local metam. in Arthur Lineament (basic volcanic rocks with magnetite - Savage River).	Development of narrow Eocambrian - Cambrian depositional troughs (Dundas, Smithton, Fossey Mtn, Dial Range, Adamsfield Troughs) between and within Precambrian regions constituting geanticlines (Tyennan, Forth, Badger Head, Rocky Cape). Inferred angular unconformity.
						Metamorphosed successions - quartzite; phyllite; quartz; mica, garnet - schist; deformed conglomerate.	Basic intrusions - now amphibolite. Eclogite inclusions	Frenchman Orogeny - folding and general metamorphism.	Hiatus - structural and metamorphic. Sedimentary rocks derived from dominantly shallow-water quartz - sandstone, siltstone, mudstone.

MY = million years