# *ARRAN THROUGH TIME*

| GEOLOGICAL PERIOD | GLOBAL POSITION / ENVIRONMENT | ROCKS ON ARRAN | INTERPRETATION | GLOBAL TECTONICS | LIFE |
|---|---|---|---|---|---|
| 2 – 65 mya **TERTIARY** | 50-60 $^0$N (present latitude) Europe Temperate climate | Widespread and varied igneous activity. Dykes, sills, plutons & volcanoes. | Thinning crust allows magma to rise upwards, intruding and extruding. | Opening of the N. Atlantic, Greenland and Europe separate. | Mammals and flowering plants dominate. |
| 65 – 135 mya **CRETACEOUS** | 35-45 $^0$N S.Europe / Mediterranean Sea Mediterranean climate | Block found in the Central Ring Complex (chalk) | 2km of sediments missing due to glacial erosion. | Pangea continues to move apart. | Primates appear and flowering plants expand rapidly. |
| 135 – 195 mya **JURASSIC** | 30-40 $^0$N N.Africa / Mediterranean Sea Mediterranean climate | Block found in the Central Ring Complex (limestone) | 2km of sediments missing due to glacial erosion. | Pangea starts to break up. | Land - conifers, birds & reptiles. Marine - ammonoids, belemites, corals, crinoids, bivalves. |
| 195 – 250 mya **TRIASSIC** | 25 $^0$N N.Africa (Algeria) / Arabia Hot and dry, desert | N.R.S. Sandstones and siltstones | Desert - lower energy than Permian. | Continued existence of Pangea | |
| 250 – 280 mya **PERMIAN** | 10-20 $^0$N N.Africa (Sudan) Hot and dry, desert | N.R.S. Aeolian sandstones - X-bedding / desiccation & fluvial breccias | Sand dunes, playa lakes and flash floods ⇒ high energy desert. | Asia and Euramerica collide ⇒ huge supercontinent Pangea. | |
| 280 – 360 mya **CARBONIFEROUS** | 0-5 $^0$N Central Africa (Congo/Kenya) Hot and wet | Lavas & pyroclastics. Sandstone, shale, limestone & thin coals. | Minor extrusive igneous activity. Thickly forested deltas advancing into warm shallow tropical seas. | Gondwana and Euramerica moving together ⇒ igneous activity. Rising sea levels after glaciation in S. hemisphere ⇒ marine sedimentation. | L - Reptiles, conifers & ferns. M - Corals, brachiopods, crinoids & ammonoids. |
| 360 – 400 mya **DEVONIAN** | 5 $^0$S Central Africa (Tanzania) Hot and wet | O.R.S. Conglomerate and fluvial sandstones. | Alluvial fans and meandering rivers. | Erosion of the newly formed Caledonian mountains. | L - Clubmosses, horsetails, ferns & freshwater fish. M - Ammonoids. |
| 400 – 450 mya **SILURIAN** | 5-15 $^0$S Southern Africa (Angola) Savanna climate | None on Arran | Uplift and erosion. | Iapetus Ocean closed @ 420 Ma, joining Europe and N. America. Caledonian mountains formed. | L - First land plants. Amphibians & insects appear. M - Graptolites. |
| 450 – 500 mya **ORDOVICIAN** | 10-20 $^0$S N.Australia Savanna climate | Highland Boundary Complex; pillow lavas and deep ocean sediments. | Part of the Iapetus ocean, obducted during the Caledonian Orogeny. | Iapetus Ocean starts to close, subduction along Solway Firth. Metamorphism of the Dalradian during the Caledonian Orogeny. | M - Graptolites. |
| 500 – 590 mya **CAMBRIAN** | 25-30 $^0$S Central / Southern Australia Hot and dry, desert | Dalradian metasediments green colour, graded beds, high % matrix. | Chlorite ⇒ low grade, regional metamorphism. Texture / Structures ⇒ deep marine turbidites. | Scotland-30 $^0$S, on the SE edge of a landmass with England-50 $^0$ S separated by the Iapetus Ocean. | M - Trilobites, bivalves and brachiopods |