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EXCURSION NOTES

Stop 1: on Poatina Highway below Poatina Chalet. Richly fossiliferous marine siltstones and sandstones of the Quamby and Glencoe Formations occur and contain dropstones of iceberg-rafted origin suggesting a cold sea.

In the first cutting beyond the turnoff to the Poatina Chalet, pale, glistening quartz-rich sandstones of fluvial origin outcrop (Liffey Sandstone).

Very fossiliferous marine pebbly sandstone outcrops in the cutting behind the Transformer Yard (Dabool Formation).

At the second penstock access road (Penstock Lookout) the Jackey Shale, a Late Permian unit formed on a river flood plain, is exposed and is followed in steep road cuttings (and cliffs on the penstock line itself) by Ross Sandstone, an Early Triassic fluvial formation. About one and a half kilometres (a mile) further up the road, large road cuts show cross-bedded sandstone of the Cluan Formation which also contains at this locality clay-pellet conglomerates with teeth and other fragments of Early Triassic labyrinthodonts.

Stop 2: on Poatina Highway at Headrace Tunnel Adit access road. Interbedded siltstone and sandstone (Tiers Formation) deposited on flood plain of a river is exposed here; from the access road can be seen the slightly undulating contact between the Triassic formations and the Jurassic dolerite (about 165 million years old) under Bradys Lookout. This exposure is part of the eastern rim of the great dolerite sheet that caps the Central Plateau. The dolerite shows conspicuous columnar jointing, probably produced both by cooling and by later uplift of the rocks. The jointing permits the development by ice-wedging of loose blocks which accumulate at the foot of the cliffs as a scree slope.

From the lookout point on the access road can be seen the wide plains of the South Esk River system in many places overlying Early Tertiary non-marine beds formed under tropical or sub-tropical conditions when a vegetation of pines, related to native pines, cycad palms, proteacean and myrtacean plants flourished. This flora differed significantly from the present one visible from this point which is dominated by acacias and eucalypts, not present in the Early Tertiary flora.

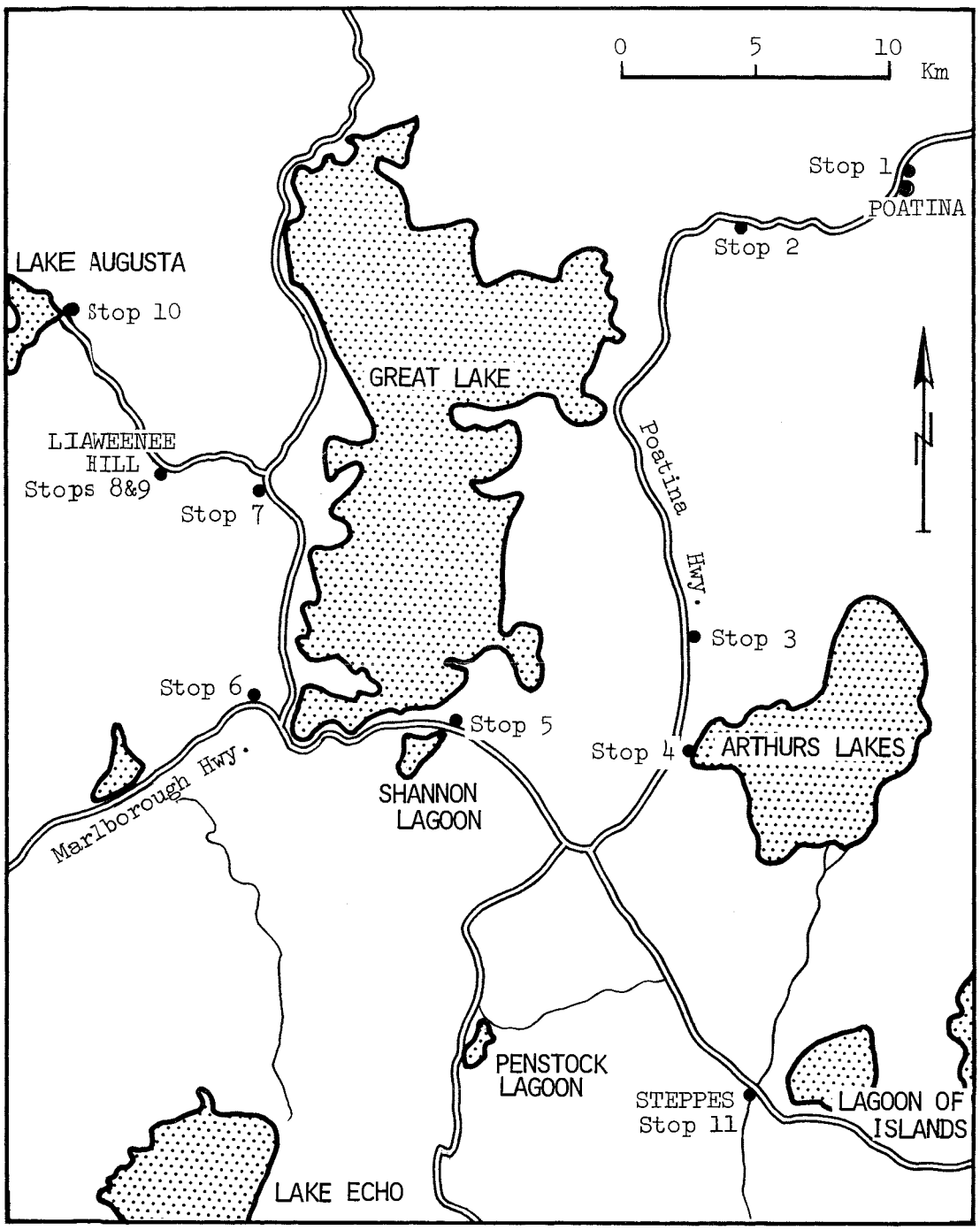
0
5
10
Km
Stop 1
POATINA
Stop 2
LAKE AUGUSTA
Stop 10
GREAT LAKE
LIAWEENEE
HILL
Stops 8&9
Stop 7
Poatina
Hwy.
Stop 3
Stop 6
Stop 5
Stop 4
ARTHURS LAKES
Marlborough Hwy.
SHANNON
LAGOON
PENSTOCK
LAGOON
STEPPES
Stop 11
LAGOON OF
ISLANDS
LAKE ECHO

Figure 29

This lookout point also acts as a useful place from which to appreciate the floral changes from the rain shadow savannah of the plains to the alpine woodland of the tops of the mountains. Within the savannah can be seen the grasslands with *Poa* species, interspersed on the plains with *Eucalyptus pauciflora* (weeping gum) and *E. ovata* (swamp gum) savannah, and riverine corridors with *E. viminalis* (manna gum) and blackwood *(Acacia melanoxylon)*. Rising above the plains are low hills clothed with dry sclerophyll forests with *E. amygdalina* (black peppermint) and *E. rubida* (candlebark). A dry sclerophyll forest also occupies the lower slopes of the Tiers with an *E. viminalis* and *E. amygdalina* assemblage nearer the plains and *E. obliqua* (stringybark) and *E. viminalis* assemblage further up the slope.

Even further up the slope these species are replaced by *E. delegatensis* (gum-topped stringybark) and *E. dalrympleana* (mountain white gum). Near the lookout point alpine woodland dominated by *E. delegatensis* is the association but some elements of the dwarf rain-forest association containing *Nothofagus* (myrtle) can be seen. The dwarf rain-forest becomes the dominant vegetation on the scree slopes and lower parts of the cliffs above. The mountains of the plateau visible from this point are occupied by alpine woodland in which *E. coccifera* (snow gum) is the main species.

Two and a half kilometres (1½ miles) further up the Poatina Highway, sandstone and siltstone with some coal seams outcrop in road cuttings and form part of the Brady Formation.

Stop 3: about 10.5 km (6½ miles) from the cattle grid at the top of the hill above Poatina is Hydro Creek. In this creek the endemic fresh-water shrimp *Anaspides tasmaniae* lives. It is a modern representative of a group of arthropods first recognised as fossils in Upper Palaeozoic rocks (340 to 225 million years ago) in Europe and North America and found later only in Australia. One representative occurs in Triassic rocks (about 200 million years) in New South Wales and four genera are recognised in the present Australian fauna, three of them in Tasmania.

Stop 4: pumping station at Arthur's Lakes, about half a kilometre (¼ mile) east of the Poatina Highway. In the shallows around the pumping station a rich fauna of aquatic crustacea and insects can normally be collected. The crustacea include phreatoicids such as *Colubotelson* found only in eastern Tasmania.

Modern phreatoicids have a "Gondwanaland" distribution - America, South Africa, the Deccan of India, Victoria, Tasmania and New Zealand. Like the anaspids, Triassic representatives occur only in New South Wales and Upper Palaeozoic ones in Europe and North America. The insects include larval forms of mayflies and caddis moths as well as adult insects.

From the pumping station, the road back to the Poatina Highway, the Poatina Highway and the Lake Highway traverse dolerite until the hill overlooking Shannon Lagoon is reached.

Stop 5: just east of the Lagoon. Silicified gravels outcrop and represent an old river channel over 25 m deep which drained the Great Lake area to the Shannon River before the overlying basalt was erupted. The basalt shows well-developed cooling joints and contains olivine. Specimens from the quarry east of the highway gave a potassium/argon age of 21.8 million years when dated radiometrically. This is the youngest dated basalt flow in the Great Lake area.

Shannon Lagoon itself contains the only known population of the endemic species *Paranaspides lacustris*, a relative of the earlier mentioned *Anaspides*.

Beyond Shannon Lagoon the Lake Highway traverses dolerite to the junction with the Marlborough Highway and beyond. This rock continues along the Marlborough Highway for about a kilometre (Stop 6).

Stop 6: where the Marlborough Highway turns south-west. Part of a badly eroded area in dolerite and with basalt immediately to the west. The erosion is due to over-grazing.

Three kilometres (two miles) further along the Marlborough Highway where it crosses the Ouse River is a high cliff in well-jointed basalt. The basalt fills a valley cut by the predecessor of the Ouse River and has been radiometrically dated at 23.6 million years. As such it is the oldest dated flow in the Great Lake area.

The Lake Highway continues on dolerite from the Marlborough Highway junction for about 1.5 km (0.9 mls.). At this point the road passes on to the same flow as occurs at Tods Corner (Stop 5). About 1.5 km further north the road passes

from massive basalt on to fragmental volcanic rocks (breccias) erupted as lava flows into a Miocene precursor of the Great Lake. Three and a half miles (5.63 km) along the road to the north, the breccias change from barren to richly mineralised types containing much zeolitic material (mainly white and crystalline).

Stop 7: crossing over Liaweenee Canal on Lake Highway. Nearby is a fish-trap under the control of the Inland Fisheries Commission. This is a traditional area where for many years fish have been caught for collection of eggs and where now brown trout are caught for transfer to other areas to control the population in Great Lake. It is also used at times as a trap for fish fry to estimate the recruitment of rainbow trout to Great Lake.

Basaltic breccia dug as the canal was cut was dumped in heaps near the canal on the western side of the Highway close to the Fisheries cottage. The breccia is rich in zeolites and other minerals which fill cavities in the rock. First to be deposited was calcite (calcium carbonate), then phillipsite, chabazite, tacharanite, and tobermorite (all hydrated alumino-silicates of calcium, magnesium, sodium or potassium), opal (hydrated silica), nontronite (hydrated calcium, sodium, iron alumino-silicate) and apophyllite (hydrated potassium, calcium, fluo-silicate). Tacharanite is a very rare mineral, first described from the Isle of Skye in 1961. The name means "the changeling" and it breaks down on exposure to minerals such as tobermorite. The mineral has not been relocated in Scotland and at present Tasmania seems to be the main locality, but it has also just been described from Germany. These minerals were probably formed by percolating waters from a lake which had become highly charged with soda, potash, lime, magnesia, iron, alumina and silica as a result of admixture with waters of volcanic origin and possibly by weathering of older lava flows.

The road along Liaweenee Canal passes from basalt on to dolerite and then on to periglacial material just before Liaweenee Camp is reached (Stop 8).

Stops 8, 9: Liaweenee Camp and Hill. On Liaweenee Canal is a flow gauging station at which an automatic Long Period Stevens (U.S.A.) A35 recorder provides a continuous chart record of canal water level from which the discharge can be calculated. In addition to a rain gauge read each day, there is also an

evaporimeter tank, the change in the level of which allows calculation of the evaporation. The change in level is determined by measuring the amount of water which has to be added to or subtracted from the tank to bring it back to the base level mark. To the positive or negative figures is added the measured rainfall for the day in points, to give the actual evaporation, e.g:

Water equivalent in points added (+) or subtracted (-) to bring level back to base mark.	Rainfall points	Evaporation points
- 60	80	20
+ 10	20	30
+ 15	0	15

Liaweenee Hill provides an excellent section of Tertiary volcanic rocks. The basal unit, a breccia resulting from hot lava plunging into water, probably formed in an old lake. It consists of broken lobes of lava with thick glassy cooling crusts, dense and scoriaceous basalt fragments and a matrix of glassy basalt. Secondary minerals cement the breccia and occupy cavities in the basalt, and have been mentioned earlier.

The breccia is overlain on an erosion surface by a massive sub-aerial sequence 75 m thick and consisting of four basaltic flows all containing olivine (a green, glassy mineral). Just beneath the top flow is a tuff (volcanic ash) containing silicified wood. The top flow has been dated radiometrically (using the potassium-argon breakdown) at 22.9 million years. Two of the flows show well-developed columnar jointing, the result of cooling.

From Liaweenee Hill at Lake Augusta the road traverses basalt and dolerite. Looking south and south-west from the road may be seen fine exposures of columnar basalt and a wide flat area on the basalt.

Stop 10: at Lake Augusta. In this area are experimental plots designed to measure the amount of sheet erosion and others to test the effects of grazing animals on soil erosion and on vegetation.

On the Ouse River just below Lake Augusta is an auto-

matic water level recorder as on Liaweenee Canal but with the addition here of a cableway for the suspension of discharge measuring instruments. On the hill east of Lake Augusta are two automatic long period pluviographs. One of these is referred to as a "Sumner" tipping bucket type which consists essentially of buckets which tip when they accumulate one point of rain. Every time a bucket tips an electrical signal is produced which causes the movement of a pen on a chart thus allowing a continuous record to rainfall to be kept. The other type is referred to as a Stevens A 35 - Float Tank type in which rain is caught in a special catcher on the roof of the shelter, and led to a tank where a float operates a stylus on a chart to provide a rainfall record. Of the two instruments the "Sumner" gives the more accurate record as the "Stevens A 35" type incurs losses in operation. However, the A 35 is the more reliable instrument, and in this case is used as a back up to the "Sumner".

From Lake Augusta back to Lake Highway and along Lake Highway to the Steppes. A deviation may be made to Penstock Lagoon to see the rich fauna of aquatic insects normally to be found there. The insects include larval and adult stages of dragon flies, mayflies and caddis moth.

Stop 11: At Steppes is a cottage once provided for the Superintendent of Police, at South Longford, James Wilson. James Wilson named the area after one he knew near Glasgow, his birthplace. On arrival he found a small cabin and his staff, a mounted trooper, awaiting him. His function was to keep order, collect rates for the Road Trust and Board of Works and act as bailiff if the rates were not paid and to distribute mail. Wilson later added to the cabin which is now preserved as an historical monument.