

on

THE POSSIBLE CAPTURE OF THE SOUTH ESK RIVER
BY THE NORTH ESK RIVER NEAR EVANDALE.

It has been known for a considerable time that the South Esk River would be eventually captured by the North Esk River through one of the tributaries of Roses Creek working its way back by "head-ward erosion" into the valley of the South Esk between Evandale and Western Junction. This is possible because in the Evandale district, the valley of the North Esk River is at a much lower level (probably 200 to 300 feet) than that of the South Esk. This difference of level has been caused by the effect of the different rocks over which the two rivers flow. The lower part of the South Esk including the Launceston Gorge, is over and through diabase (dolerite) country which is a hard and resistant rock and considerably retards the vertical corrasion (cutting-down) of that river. On the other hand, the lower part of the North Esk Valley is in Tertiary sands gravels, clays &c. which are soft and easily eroded, and have not retarded the vertical (or the lateral) corrasion of this river to the same extent as the diabase has done in the case of the South Esk River.

The two rivers are closest to one another in the Evandale - White Hills district and both flow over country occupied by Tertiary sediments and possibly interbedded basalt.

This district is drained by Roses Creek a tributary of the North Esk, which has a course centrally situated between the two rivers. This creek and its tributaries have eroded their valleys deeply into the soft Tertiary rocks. The creek has a number of tributary streams (small creeks, gullies &c.) on its southern side, all of which have their sources or heads in the Evandale - Western Junction area, and flow north into Roses Creek. The heads of some of these streams are within half a mile of the South Esk River and the closeness of the divide to the South Esk River can be seen on the attached plan.

Further headward erosion of the creeks and gullies will in the end result in the capture of the South Esk River, i.e. all the water of the South Esk above Evandale will then flow through the capturing tributary, along Roses Creek, and into the North Esk.

The danger from capture in the above manner will not take place for some time unless earth movements including earthquakes, faulting, and cracking of the ground occurs.

The headward erosion will however need to be watched and walls of stone, concrete &c. built at the heads of the creeks or gullies which threaten danger.

The large flood of April 1929, however, revealed a more dangerous aspect of the possible capture. After the floods had subsided, the Public Works Department made a traverse of the "trash" line, i.e. the upper limit reached by the flood and denoted by branches, twigs, grass, leaves &c. It was found by Mr. Pitt, who made the traverse, that near Evandale, the water was within a few feet of the lowest part of the divide, the position of which is marked approximately on the attached plan. If the water had risen to the level of this low part, it would have caused

a very serious position. The water would have trickled over into the valley of Roses Creek and have cut a channel for itself. The longer the flood waters kept their height the deeper and wider the channel would have been and a permanent channel might have been cut so that the waters of the South Esk would have flowed into Roses Creek and thus into the North Esk.

On being notified by the Director of the Public Works Department of this rise of the water to within a few feet of the divide, it was arranged that a geological inspection of the locality should be made when opportunity offered, as the rocks occurring at that point would affect the question as to whether a permanent channel might be cut in any very high flood.

The country between Evandale and Western Junction is composed of the following strata in descending order:

- (1) Gravels, at least 20 feet thick.
- (2) Basalt, about 100 feet thick.
- (3) Gravels, sands and clays several hundred feet in thickness.
- (4) Diabase bedrock.

The upper gravels have been mainly removed by denudation but a small remnant occurs on the divide to the west of the lowest part.

The basalt is exposed near Western Junction and to the north and west towards Launceston. Although it does not outcrop prominently, it occupies the divide between the lowest part and Western Junction. The rocks occupying portion of the divide between the lowest part and Evandale are not determinable due to the waste from the upper gravels covering the surface. It is anticipated however that the basalt will extend some distance at least towards Evandale.

The sub-basaltic gravels &c. are only exposed at lower levels such as the Valley of Roses Creek, White Hills &c.

It is anticipated that at the lowest point of the divide there will be several feet of gravelly soil overlying weathered basalt. While the weathered basalt may be more resistant to corrasion than the gravels &c. it would not be sufficiently resistant to prevent a channel being cut quickly in it. The less weathered the basalt, the more resistant it would be.

From the above, it will be realised that the South Esk River is in danger of being captured by the North Esk River by two methods.

(1) The natural headward erosion of the tributaries of Roses Creek. This process will take some time under normal circumstances. The most vigorous of the streams are those near Western Junction and possibly an inspection of these at long intervals might be advisable. In general however, the local residents could be relied upon to give warning of any pronounced headward erosion of these streams and possible danger arising therefrom. Any dangerous erosion could be prevented or delayed by stone or concrete walls.

(2) A high flood in the South Esk causing water to flow over the lowest point of the divide between the two rivers and to establish a permanent channel.

In the 1929 flood the water was only a few feet in level below the lowest point in the divide. A larger flood or a southerly, south-easterly or south-westerly wind banking up the water would tend to bring this about.

It is hardly necessary to point out that the capture would:

- (1) Cause the waters of the South Esk to flow permanently along the North Esk River.
- (2) Destroy the Perth water supply scheme and any private ones along the South Esk river below Evandale.
- (3) Deprive the Launceston Gorge of the greater part of its water supply.
- (4) Cause loss of life and damage to property during the actual capture and the flooding of the Roses Creek valley.
- (5) Cause permanent loss of property in the Evandale and White Hills district.

As far as can be seen no flood has ever reached a height sufficient to cause the South Esk water to flow over the divide. The position would be so serious however in the event of such happening that it is recommended that precautionary measures be taken.

This would entail a survey of the divide near the lowest part and of the upper limit of the 1929 flood and it is suggested that a wall be constructed so that there will be a margin of 10 feet above the 1929 flood at every point of the divide.

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