

NOBBYS TUFF - THE ROCKS OF NOBBYS HEAD

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1. INTRODUCTION

Nobbys Head, standing guard at the entrance to Newcastle Harbour, has caught the imagination of artists for over 200 years. It is arguably Newcastle's most photographed landmark. Thousands of people walk and cycle past Nobbys each year on trips along the breakwall and to Nobbys Beach. Every year many sail and surf past the headland. Nobbys Head is an important stop on numerous school and university excursions. But what is Nobbys Head made of? It looks different to other rocky cliffs along the Newcastle coast. What is it doing there, standing up as an isolated hill at the mouth of Hunter River? How long has it been there and why is it crumbling away at the edges?

We are going to take a closer look at the story of the rock making up Newcastle's icon: from its explosive origin 250 million years ago to the present day, its significance and use to the Aborigines, its use to geologists, and what has happened to the headland since Europeans settled here over 200 years ago.

2. STANDING ALONE

Nobbys, now 29 metres tall, is an erosional remnant of originally more extensive layers of sedimentary rock. Most of the headland is made up of light grey and cream coloured layers of consolidated volcanic ash, called the Nobbys Tuff. It was called Nobbys Chert by David (1907). This geological unit extends from sea level up to almost the top of the cliff, with a thickness of 25 metres. The Nobbys Tuff rests on the Nobbys Coal Seam, whose black layers are visible at very low tides, forming part of the rock platform next to the breakwall. Towards the top of the cliff, grey shale and thin coal beds of the Victoria Tunnel Coal Seam overlie the Nobbys Tuff.

The Nobbys Tuff once extended all the way down Newcastle coast. However, over tens of millions of years weathering by wind, rain, salt air and erosion by ancient rivers and the sea have removed it from many parts of the coast. South of Nobbys, the tuff can be recognised high up in the cliffs of Shepherds Hill and Merewether. Further south, at Glenrock, the Nobbys Tuff outcrops again just above sea level. Tracing the tuff unit from Nobbys to Glenrock shows that it forms a broad arch-like fold. This structure is called the Shepherds Hill Anticline (Figure 5, Kerr 2000, Bathers Way Geology Report). From Glenrock, the tuff continues to dip southwards, disappearing below sea level.

Inland, the Nobbys Tuff outcrops from Newcastle to Stockrington. South of the outcrops it can be identified beneath the land surface in coal mines and drill holes in the Lake Macquarie area and beyond, at least as far as Broke.

The outcrop of Nobbys Tuff at Nobbys is very important and special to geologists as it is the thickest section of the unit that has been found.

3. AN EXPLOSIVE BIRTH

About 250 million years ago, numerous loud, explosive eruptions from a volcano located 30 km to the east of Newcastle blasted thick clouds of volcanic ash high into the sky. This was before the time of dinosaurs, birds and flowering plants. Wind blew the ash clouds over the Hunter region, which at this time consisted of a low-lying alluvial and deltaic plain covered by vast wetlands (swampy forests and lakes) separated by rivers. The shoreline lay further to the southeast than it does today.

From the clouds, volcanic ash rained down over the landscape, smothering the swamps and lakes. In some places, such as where Nobbys now stands, rivers washed the ash into thick piles of well layered deposits of differing grainsizes and compositions.

After the eruptions ceased, the volcanic ash layers were buried by more swamp, lake and river deposits and compacted to form the rock tuff.

Volcanic ash consists of solid particles less than 4 mm across. Thin sections of the Nobbys Tuff examined under the microscope show crystals of quartz, feldspar, and biotite, shards of volcanic glass and clay minerals. Much of the original glass was altered to clay soon after deposition.

4. WET AND COLD AT THE THE SOUTH POLE

5. BURIED AND SINKING

6. RIFTING AND A NEW SEA

Uplift of Eastern Highlands
Folding & faulting
Intrusions of basalt dykes
Tasman Sea created

7. CRACKING, RUSTING AND EROSION

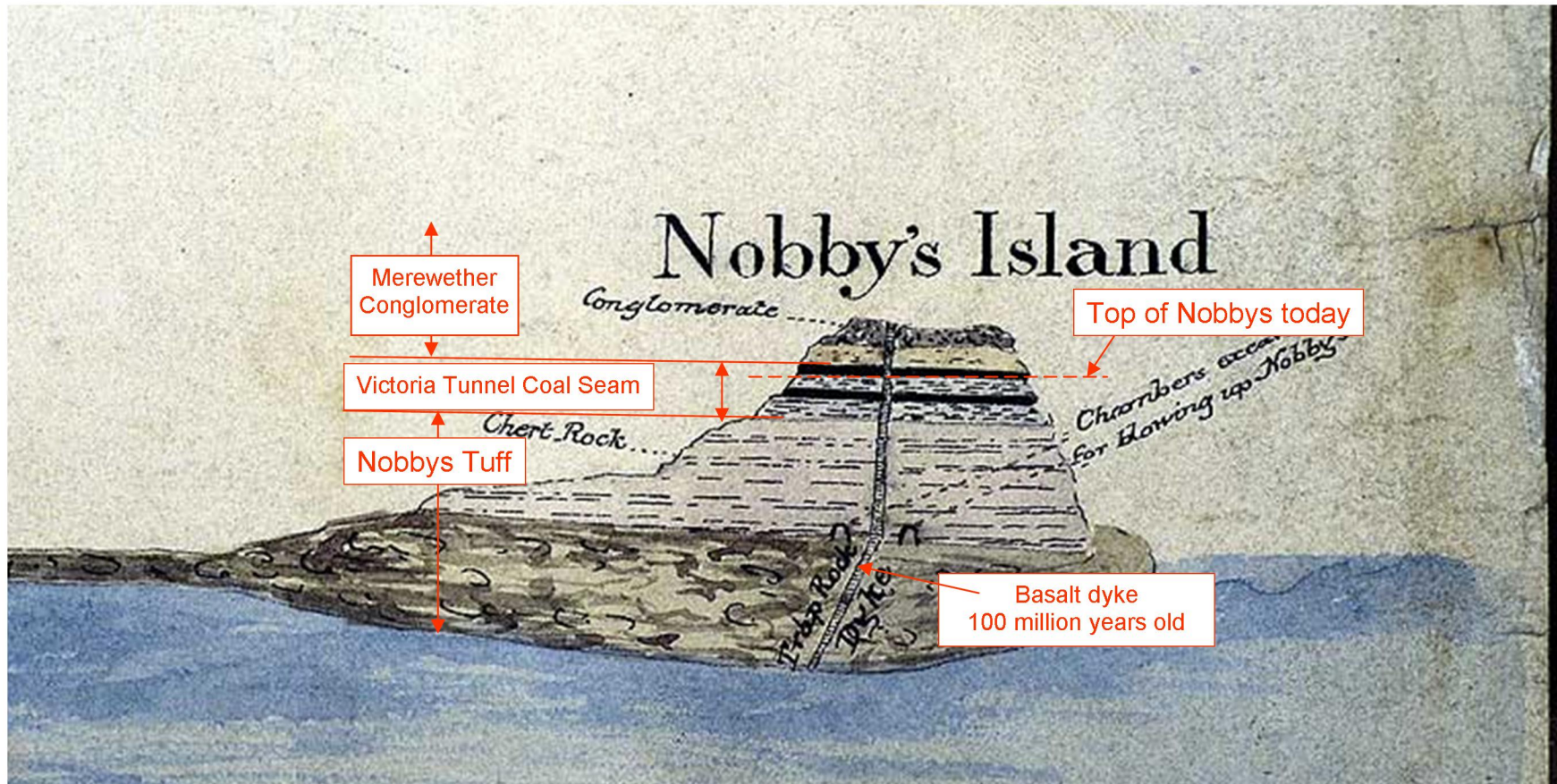
8. NOBBYS TUFF UP CLOSE

Three main types of layers:
Sandy tuff
Clayey tuff
Silicified tuff, extremely fine grained & hard, Aborigines made tools from this type.

9. FUTURE NOBBYS - A CRUMBLING ICON.

10. REFERENCES

To be continued.....



Stratigraphical Sketch of Nobbys Head, looking west, by William Keene 1864,
with current stratigraphy of Newcastle Coal Measures added.
The sedimentary rocks are about 250 million years old.

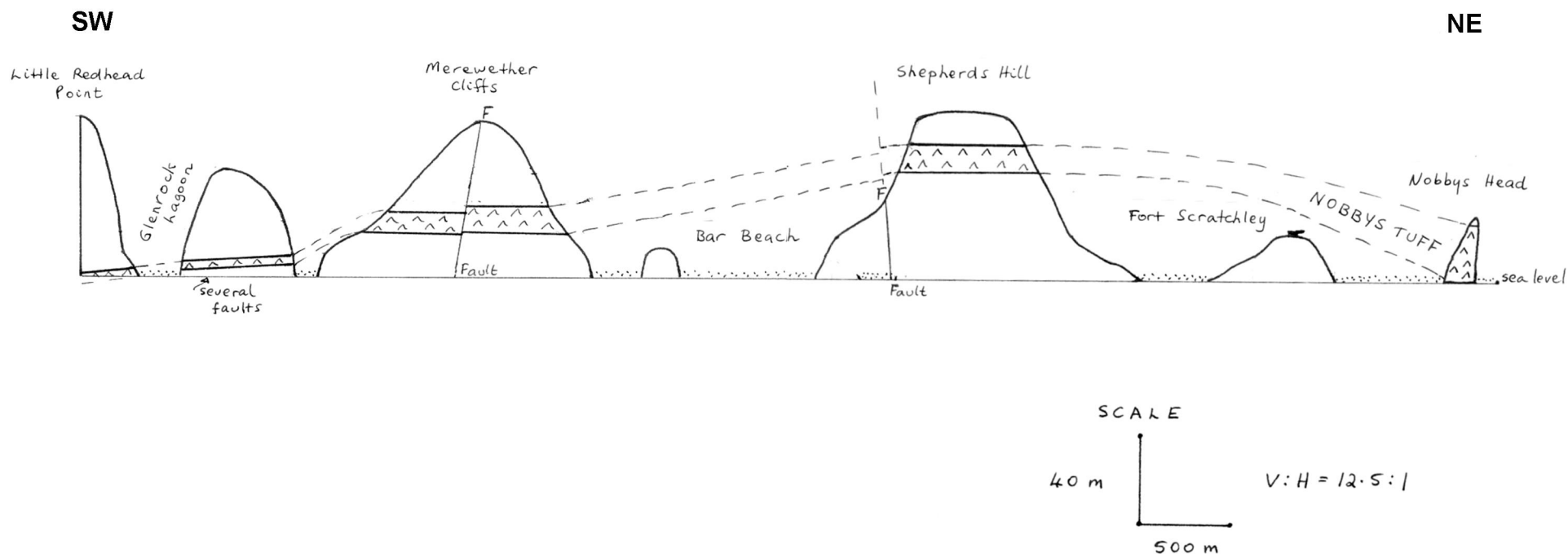


FIGURE 5
CROSS SECTION OF THE SHEPHERDS HILL ANTICLINE
FROM LITTLE REDHEAD POINT TO NOBBYS HEAD
DEFINED BY NOBBYS TUFF