

# NOTHE GARDENS LANDSLIDE, THEN AND NOW

ROCKWATCH FIELD TRIP SERIES ALAN HOLIDAY

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## BACKGROUND INFORMATION: LOCATION

Nothe Gardens is located on the south side of Weymouth Harbour within easy walking distance of the town centre. It is an important open space and amenity area for Weymouth residents and holiday makers.

Map extract from Ordnance Survey 1:25,000 sheet OL15





## **BACKGROUND GEOLOGY**

Weymouth is located on Jurassic Oxford Clay and the Nothe area is sited on slightly younger rocks of Corallian age, Nothe Grit (sandstone) and Nothe Clay.

The rocks are dipping gently to the south, being on the south side of the Weymouth Anticline.



#### HISTORY: IN THE SPRING OF 1988 THERE WAS A MAJOR LANDSLIDE AFFECTING NOTHE GARDENS





#### WHAT HAPPENED



A large amount of soil and rock slid towards the sea producing a large back scar



## LANDSLIDES OCCUR BECAUSE OF THE GEOLOGY

The controlling factors are:

- I. The geology in this case Nothe Clay.
- 2. Gravity due to a steep slope.
- 3. The presence of water due to rainfall.
- 4. In this case possibly dip of the strata (seaward to the south)

On the coast, erosion by the waves cause steep cliffs which slump down through gravity and especially in the winter when it is wet. However in this case there was a sea wall which was pushed over by the landslide.

#### **RACKWATCH** WHAT WAS LEFT OF THE SEA WALL!



In the foreground is the Nothe Grit forming ledges on the beach, with soil and clay above



#### THE VICTORIAN NOTHE FORT ON THE RIGHT OF THIS PICTURE WAS NOT AFFECTED





## HISTORIC PICTURE OF NOTHE FORT AND NEARBY NOTHE GARDENS

Note the sea wall in this historic picture which helps to explain the large number of stone blocks in the previous frame. (picture from Geoff Kirby website on the Nothe)







Part of the old sea wall survived seen in the middle of this picture. Note the clay sliding over the top of the wall.





In some cases the clay flowed without doing too much damage.



## BUT ELSEWHERE DAMAGE WAS MORE SERIOUS



This picture shows what looks like rotational slip, moving down and tilting backward.



#### EVIDENCE OF VEGETATION AND SOIL SLIDING DOWN SLOPE





# SO, WHAT IS IT LIKE NOW?



The old sea wall on the left has been replaced with a new sea wall creating a nice esplanade to walk on





Rock armour made of Portland Limestone blocks has been placed in front of the sea wall. Question: Why do you think this was done?



#### **PURPOSE OF ROCK ARMOUR**



**Answer:** The rock armour helps to protect the sea wall from attack by storm waves and adds extra weight so a landslide towards the sea is less likely to push the rock armour away.



## HOWEVER SOME MOVEMENT IS STILL OCCURRING!



How can we tell? Foot paths are developing cracks. What might be happening is soil creep, another form of mass-movement of just the surface layer. The path is rigid so it doesn't flow and it splits.



# **ABOUT THE AUTHOR ALAN HOLIDAY**

Professionally, Alan Holiday was a geography and geology teacher in the Weymouth area for many years and also had a year in the oil industry as a mud logger.

Alan enjoys an active role in local geological groups and is a regular Rockwatch Field Trip Ambassador, including our Annual Residential to Dorset.

His favourite fossil type is a trilobite. This example of Wenlock Limestone has a trilobite pygidium, collected at Ironbridge when Alan was a child.







#### **CREDITS**

Ordnance Survey (slide 2)

Geoff Kirby website on the Nothe - <u>http://www.geoffkirby.co.uk/</u> (slide 9)

All other photos have been taken by the author



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