

University of Dublin

Trinity College

Matriculation
Examination

Hilary Term, 2010

Geology

Wednesday 7th April

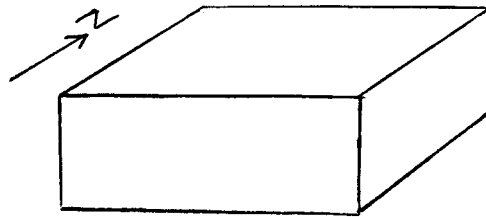
Examination Hall

9.30 - 12.30

Dr I.S. Sanders and Prof. G. Clayton

*Answer any **five** questions. Credit will be given for citing examples, where appropriate, of geological features you have seen in the field.*

1. The Earth's interior beneath Dublin is believed to consist of continental crust, mantle and core. Write about the definition, thickness, composition, and internal variation of each of these three units.
2. Describe the appearance of granite in the field, mentioning any evidence supporting the view that granite was once molten. Name and state the chemical composition of the main minerals in this rock, and give examples of where it occurs, and when it formed, in Ireland.
3. Draw four separate block diagrams viewed from the south-east (as shown) to illustrate the following geological structures: (a) strata dipping east at 30° , (b) strata dipping west at about 70° separated by an angular unconformity from younger, overlying strata that dip SE at about 30° , (c) strata folded into an asymmetrical anticline that plunges at 20° to the north, (d) strata dipping gently to the NNE cut by a reverse fault that trends north-south and dips steeply to the west. (5 marks for each part)



4. Copper, lead and zinc are three metals that are (or have been) extracted from Irish ore. Name and describe the main ore minerals, giving their chemical compositions, discuss how the ores are thought to have formed, and give examples of where they occur in Ireland.
5. Write about limestone, commenting on several or all of the following: its occurrence in Ireland, the minerals it is made from, flint and chert, karstic weathering, oolitic limestone, fossiliferous limestone.
6. Using clearly labelled drawings describe an example of (a) a trilobite and (b) an ammonite. Discuss the mode of life and state the geological range of each kind of fossil organism.
7. Certain rocks consist of conspicuously large grains or fragments enclosed within fine-grained material. Name and describe examples of such rocks, and explain how they may have formed.
8. Write a short essay on volcanoes and volcanic rocks, and mention some examples of the latter in Ireland. The Sugar Loaf Mountain in County Wicklow is not an extinct volcano, as some people would believe, but what is it?
9. Write an essay on the evolution of vertebrate animals, from their origins through to the appearance of man.
10. What do you understand by 'The Ice Age'? Describe examples of each of the following features, and suggest what they tell us about the last Ice Age in Ireland: glacial erratics, glacial striations, boulder clay, roches moutonnées, U-shaped valleys, eskers.

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Instructions to candidates:

Answer any **five** questions. Credit will be given for citing examples, where appropriate, of geological features you have seen in the field.

Begin each answer on a new **page**.

Write the numbers of the questions you have attempted in the column provided on the cover of the answer book

You may not start the examination until you are instructed to do so by the invigilator.