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FORCES UNDER THE EARTH

What causes earthquakes?

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(First of two articles)

When you ask the question: what causes earthquakes? you are really asking two questions. You are sort of playing detective. You want to know not only who committed the crime, but also how the crime was committed. So, with regard to earthquakes, you want to know not only what causes earthquakes but also how they are caused, that is, their mechanism.

If you go up to Baguio either through Kennon Road or Naguilian Road, at certain places you will come across mountain sides that are bare, without trees or vegetation; the bedrock is exposed. Upon closer exam-

ination you notice that the rocks are layered or stratified; moreover, the layers are not flat nor horizontal but are wavy and folded, and also tilted.

People who collect fossils have found sea shells or skeletons of prehistoric fish buried inside these rocks. Now, how did marine animals ever get to be buried so high up in the mountains?

We know for a fact that when a fish or snail or clam dies in the ocean, it usually sinks to the bottom and gets buried in the mud or sand. After thousands of years, this mud or bottom sediment eventually becomes

consolidated into a rock, called sedimentary rock.

What puzzles us is this: how did sedimentary rocks that were once at the bottom of the ocean come to be situated at such high altitudes above sea level? Could the sea level have receded so far down in the last hundreds or thousands of years? Or is it not more logical to assume that some gigantic forces from the interior of the earth must have pushed up the rocks from below until they eventually attained such high elevations?

'Orogenic' forces

Earth scientists call these

forces the mountain building forces, or *orogenic* forces. As they pushed upwards, certain parts of the earth's crust or outer shell bulged out and became anticlines; other parts buckled downwards and became synclines.

The expanse of these anticlines and synclines sometimes extended halfway across a continent. Synclines became seas where sedimentary rocks formed at the bottom.

Originally these rocks were layered and flat. But sooner or later, they also experienced the upward

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